Name: _____ Year: _____

Semester: _____ Section: _____

El Camino College
EMT Program

Skills Workbook

FTECH – 144 Course Supplement

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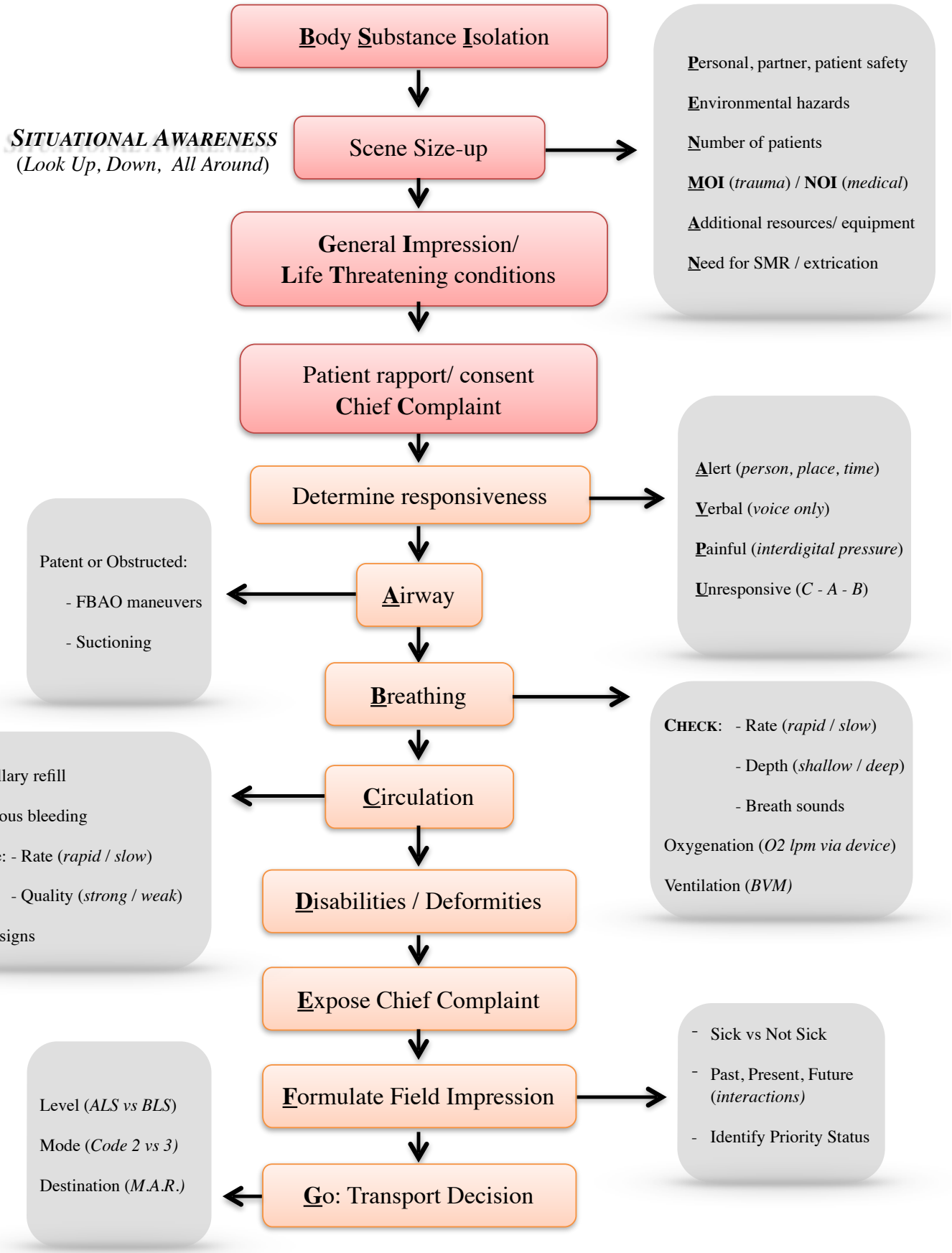
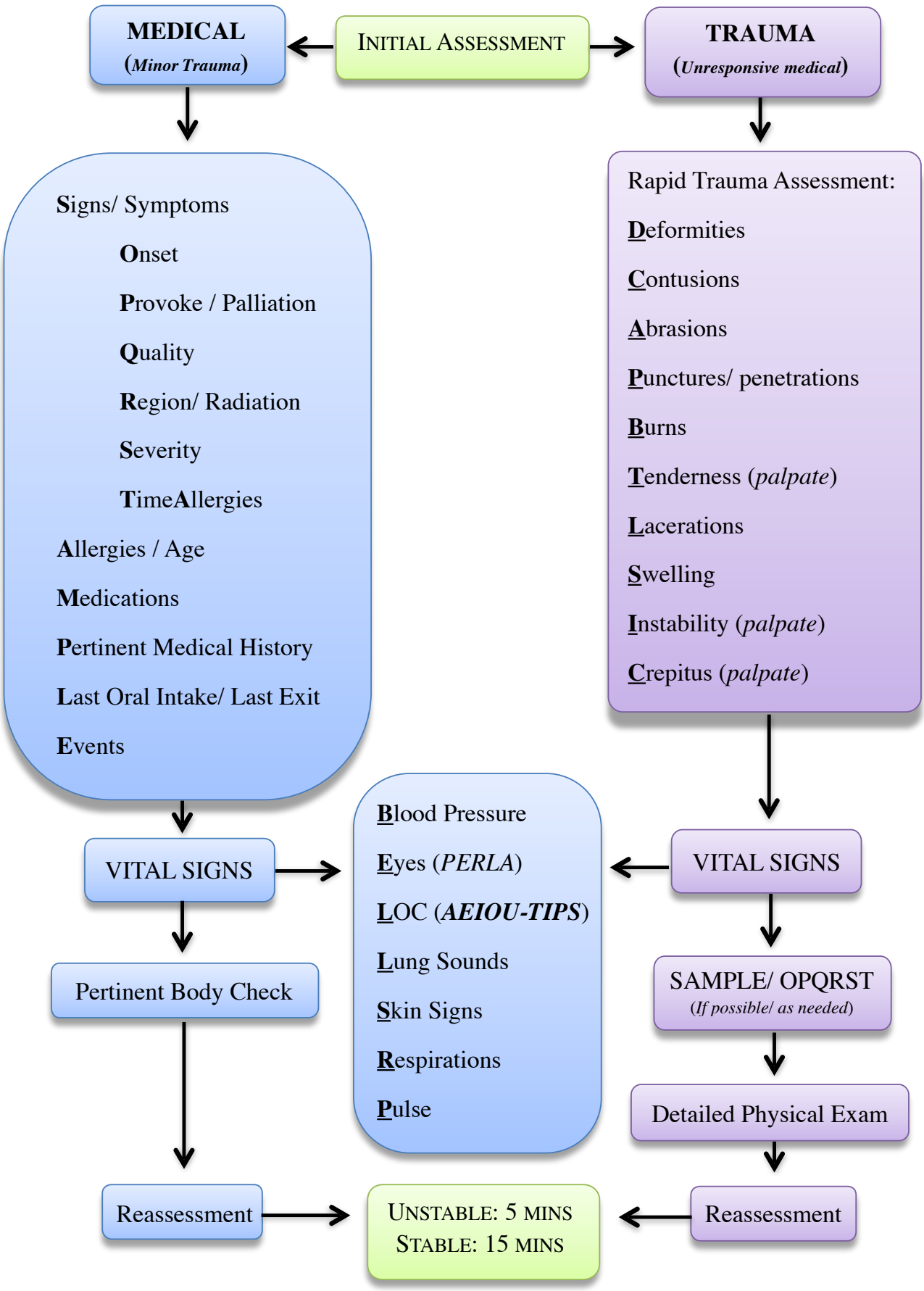
Section 1: Preparatory

Initial Assessment (Primary)



Focused History and Physical (Secondary)



Los Angeles County Prehospital Code of Ethics

The Emergency Medical Services (EMS) System consists of health care professionals that include EMT's, paramedics, nurses, physicians, educators, and administrators. This Code defines our ethical responsibilities and beliefs in the following principles for guiding practice…

Respect

- Recognize, acknowledge, listen, and encourage all members of the health care team
- Uphold and maintain patient confidentiality and privacy
- Honor the patient's rights and autonomy to make decisions regarding their medical care

Caring

- Provide professional, compassionate, and competent care to all patients
- Advocate for the patient's care needs
- Participate and support the advancement of the EMS system through education, training , and continuous quality improvement
- Support prehospital care research to validate, improve and promote evidence-based practice

Fairness

- Provide competent medical care to all persons with compassion and respect for human dignity regardless of nationality, race, creed, religion, sex, status, or financial considerations
- Ensure justice by treating all individuals equally and fairly
- Encourage and support impartiality in the delivery of patient care. Decisions should be absent of bias, prejudice or benefit one person over another for improper reasons but based on objective criteria

Integrity

- Promote honesty, truthfulness, and consistency in action and practice by all members of the health care team
- Demonstrate responsibility and accountability by maintaining licensure/certification, operating within one's scope of practice, and providing thorough documentation
- Inspire fidelity by adhering to professional code(s) of ethics, following policies and procedures, ensuring team members are respectful, competent and capable of performing duties, and honoring agreements with patients and colleagues
- Maintain trustworthiness and excellence in the delivery of patient care and medical practice

How to Succeed on a Fisdap Exam

Fisdap exams are uniquely designed to assess your knowledge and critical thinking ability. Questions are authored by instructors across the country and reviewed by subject matter experts and a board certified Emergency Physician. After you finish the exam, we hope you will come away with a good understanding of topics that you mastered along with ones that need improvement. Please take advantage of the guidelines below that outline how to succeed on a Fisdap exam.

The exams are intended to prepare you for your national or state certification exam. In addition to studying the textbook, we recommend completing the workbook that accompanies it and familiarizing yourself with current American Heart Association guidelines. We also encourage the use of Fisdap Study Tools. This product allows you to practice your test-taking and critical thinking skills, which will help you solve real life EMS problems.

Fisdap test items generally conclude with one of the following questions. Understanding how to interpret these questions will help you succeed.

- **What should you do?** These questions ask you to apply knowledge to treat a patient as you would in the field. You should select the best treatment option available. If you feel there are multiple "correct" answers then pick the BEST option by imagining that there is a "next" or "first" at the end.
  E.g. "What should you do *next*?" or "What should you do *first*?"

- **What should you suspect?** These questions ask you to diagnose patients by suspecting underlying comorbidities or pathophysiologies that are described in the question. If more than one answer seems "correct," think of the condition that is the most life-threatening. You should suspect the most lethal diagnosis given the signs and symptoms.

- **What is the most likely cause?** These questions are asking you to think about the most probable cause or condition based on the signs and symptoms. This type of question asks about what is most likely, NOT the most lethal.

Test-taking tips:

1. Read the question completely. Before looking at the possible answers imagine what you should do to take care of the patient.
2. Read all possible answers completely and consider the BEST answer.
3. During the exam, if your instructor allows, we encourage you to write down (on a blank piece of paper) words or topics you want to review afterwards.
4. All questions are randomized, so don't get discouraged if you get difficult ones right away.

We wish you the best on this exam, on your certification exam, and ultimately in your new career as an EMS professional!

EMT Comprehensive Study Guide

Airway

- Administration of a bronchodilator
- Appropriate ventilation rates
- Assessment and treatment of a patient with a foreign body obstruction
- Assessment and treatment of an asthmatic patient
- Complications of assisted ventilations
- Determining appropriate oxygen delivery device based on patient S/S and history
- Identification of hypoxia
- Indications and techniques for suctioning
- Indications and techniques for using a nasal airway
- Indications for an oral airway
- Respiratory assessment
- Signs and symptoms of emphysema
- Signs and symptoms of hyperventilation syndrome
- Signs and symptoms of respiratory failure
- Signs, symptoms, and treatment of an occluded airway
- Techniques for opening the airway of an infant
- Treating a patient in respiratory arrest
- Treating a vomiting patient
- Treatment for a patient in respiratory failure

Cardiology

- AHA Chain of Survival
- Assessment and treatment for a patient with chest pain
- Causes of cardiac arrest
- Causes of chest pain
- Complications associated with AED use
- Contraindications for nitroglycerin administration
- Effects of nitroglycerin
- Initial assessment techniques
- Proper use of an AED
- Signs and symptoms of a stroke
- Signs and symptoms of cardiac compromise
- Signs and symptoms of congestive heart failure
- Signs and symptoms of myocardial infarction
- Treating a cardiac patient who suddenly becomes unresponsive
- Treating a patient immediately after resuscitation from cardiac arrest
- Treating a patient in cardiac arrest
- Treating a pediatric patient in cardiac arrest

Medical

- Assessing a diabetic patient
- Assessing a patient with possible hazardous material exposure
- Assessing and treating special populations
- Communicating with a patient with a psychological disorder
- Complications of oral glucose administration
- Indications for oral glucose administration
- Side effects of epinephrine administration
- Signs and symptoms of a hyperglycemic event
- Signs and symptoms of an anxiety attack
- Signs and symptoms of an electrical injury
- Signs and symptoms of an overdose
- Signs and symptoms of heat stroke
- Signs and symptoms of hypoglycemia
- Signs and symptoms of tuberculosis
- Treating a bee sting
- Treating a hypothermic patient
- Treating a patient who has been poisoned
- Treating a patient with a chemical burns
- Treating a patient with a heat emergency
- Treating a patient with an anaphylactic reaction
- Treatment for an unresponsive near-drowning patient

Trauma

- Anatomy of the circulatory system
- Assessing and treating a patient with a suspected spine injury
- Classification of burns and proper treatment
- Identifying appropriate splinting methods
- Indications for removing a patient's helmet
- Indications for the use of an occlusive dressing
- Indications for use of a PASG
- Recognizing the need for transport via helicopter
- Risk factors, signs, and symptoms of internal bleeding
- Signs and symptoms of chest injuries
- Signs and symptoms of compensated shock
- Signs and symptoms of increased intracranial pressure
- Treating a patient with a penetrating chest injury
- Treating a patient with an amputation
- Treating a patient with an extremity injury
- Treating a patient with an open abdominal injury
- Treating a patient with facial trauma
- Treating a patient with multi-system trauma
- Treating a patient with severe external bleeding
- Treating an ejected patient
- Treating an open neck wound

OB-Peds

- Causes of seizures
- Common causes of pediatric death
- Complications of delivery
- Interacting with pediatric patients
- Oxygen administration for a pediatric patient
- Positioning of a pregnant patient during transport
- Post-delivery care of a neonate
- Post-delivery resuscitation care
- Progression of respiratory emergencies
- Responding to a case of suspected child abuse
- Signs and symptoms of an asthma attack
- Signs and symptoms of dehydration
- Signs and symptoms of eclampsia
- Signs and symptoms of imminent delivery
- Signs and symptoms of respiratory distress
- Treating a child in respiratory distress
- Treating a child with a fever
- Treating a child with a penetrating injury
- Treating a child with an airway obstruction
- Treating a child with burns
- Treating a child with dehydration
- Treating a patient with epiglottitis
- Treating a pregnant patient with a traumatic injury
- Treatment of a multi-system trauma patient

Operations

- Communicating with a hospital
- Communicating with deaf patients
- Completing legal documents
- Different types of patient consent
- Documenting patient refusal of care
- Driving an emergency vehicle with lights and sirens
- Identifying the need for rapid extrication
- Infection control precautions
- Job responsibilities at an MCI
- Obtaining access to a patient
- Preparing your ambulance for a call
- Preserving evidence at a crime scene
- Removing a patient from a tight space
- Responding to a hazardous material incident
- Responding to a patient who refuses care
- Responding to an unsafe scene
- Restraining a combative patient
- Stages of the grieving process
- Techniques for decontamination
- Treating a patient with a valid DNR

El Camino College EMT

Position Description

Class Leader

PURPOSE

In an effort to foster responsibility and accountability each class will appoint a Class Leader. The Class Leader will work directly with the program staff to ensure efficient day to day operations within the classroom environment. The Class Leader will serve as the direct contact between squad leaders and the EMT program instructional staff. The Class Leader will also be responsible for the duties set forth below.

DUTIES AND RESPONSIBILITIES

The Class Leader will serve as the direct liaison between the program staff and the squad leaders. Other duties include but are not limited to:

- Serve as a role model for the Squad Leaders and members in both manner and dress.
- Ensure that all Squad Leaders are aware and informed of their duties and assist/ mentor them in fulfilling those duties as necessary.
- Ensure that the class sign in sheet is being used during each class and that all Squad Leaders have confirmed any absences or known tardies.
- Assist the program staff in enforcing all rules and regulation including but not limited to dress code, grooming code and code of conduct.
- Ensure that all squad related duties are assigned and completed as required.
- Notify class when breaks are over and ensure an orderly return to the classroom.
- Ensure that both lab and classroom environment are always left in a neat and orderly fashion.
- Perform all other duties as assigned by the program staff.

El Camino College EMT

Position Description

Squad Leader

PURPOSE

Each EMT class is divided into small groups of between 5 and 7 students. These groups are referred to as “Squads” and are numbered from 1 to 6. Once formed, each squad will remain as a cohesive team working together throughout the semester. Squads will work together during skill practice sessions and will respond to class scenarios when on duty. In addition, squads are encouraged to assemble outside of class to study for written and practical skills exams. In an effort to develop leadership skills and encourage accountability, each squad must appoint a member of the squad to be Squad Leader.

DUTIES AND RESPONSIBILITIES

The Squad Leader will serve as the liaison between the Class Leader and the other members of the squad. Other duties include but are not limited to:

- Serve as role model for the squad members in both manner and dress.
- Ensure that all squad members have a valid email address and are checking email and logging on to the class sites on a regular basis.
- Ensure that simulations and role-playing scenarios from “Sick / Not Sick” are organized, and well prepared for classroom presentation.
- Ensure that all squad members have accounts on Certified Profile, FISDAP, and Navigate 2 by the second week of class.
- Notify squad members via email or phone as needed for any class updates.
- Ensure that all squad related duties are assigned and completed as required.
- Encourage, mentor and assist other squad members with class related responsibilities, including online access and participation.
- Assist other squad members in complying with all class related responsibilities.
- Assist other squad members in complying with all class related requirements and rules including the dress code.
- Lead and foster participation in all online activities.

El Camino College EMT

Position Description

Assistant Squad Leader

PURPOSE

Each EMT class is divided into small groups of between 5 and 7 students. These groups are referred to as “Squads” and are numbered from 1 to 6. Once formed, each squad will remain as a cohesive team working together throughout the semester. Squads will work together during skill practice sessions and will respond to class scenarios when on duty. In addition, squads are encouraged to assemble outside of class to study for written and practical skills exams. In an effort to develop leadership skills and encourage accountability, each squad must appoint a member of the squad to be Assistant Squad Leader.

DUTIES AND RESPONSIBILITIES

The Assistant Squad Leader will serve as a second leader within each squad to maintain standards and success within each squad. Other duties include but are not limited to:

- Serve as role model for the squad members in both manner and dress.
- Serve as the Squad Leader as needed when the assigned Squad Leader is not with the squad.
- Serve as the equipment monitor that checks out equipment from skills instructors.
- Ensure that all squad white boards and markers are organized and cleaned, tables are lined up and chairs pushed in by the end of each class.
- Ensure that simulations and role-playing scenarios from “Sick / Not Sick” are organized, and well prepared for classroom presentation.
- Ensure that all squad members have accounts on Certified Profile, FISDAP, and Navigate 2 by the second week of class.
- Ensure that all squad related duties are assigned and completed as required.
- Encourage, mentor and assist other squad members with class related responsibilities, including online access and participation.
- Assist other squad members in complying with all class related responsibilities.
- Assist other squad members in complying with all class related requirements and rules including the dress code.
- Lead and foster participation in all online activities.

Medical Terminology Workout

a-	without, not
an-	without, not
brady-	slow
eu-	good, normal
tachy-	fast
dys-	bad, difficult

-pnea	breathing
cardi(o)	heart

bradycardia: _____

tachycardia: _____

apnea: _____

eupnea: _____

bradypnea: _____

tachypnea: _____

dyspnea: _____

apneic: _____

tachyneic: _____

Medical Terminology Workout

gluc(o) glucose
glyc(o) sugar
hyper- excessive, above normal
hypo- beneath, below normal
norm(o) normal
-emia relating to blood
-tensive relating to blood pressure
-tension blood pressure
-vol amount, quantity

Hypoglycemia: _____

Hyperglycemia: _____

Hypotensive: _____

Hypertensive: _____

Normotensive: _____

Hypertension: _____

Hypotension: _____

Hypovolemia: _____

Medical Terminology Workout

-algia pain
-itis inflammation
cephal(o) head
cerebr(o) brain
crani(o) skull
oste(o) bone
cost(o) ribs
cutane(o) skin
derm(a) skin
derm(o) skin
epi above, on
gastr(o) stomach
laryng(o) larynx
muscul(o) muscle
my(o) muscle

Dermatitis: _____

Myalgia: _____

Laryngitis: _____

Cephalalgia: _____

Subcostal: _____

Subcutaneous: _____

Epigastric: _____

Medical Terminology Workout

iatr(o)	physician, treatment
-iatry	medical profession, treatment
-itrics	medical profession, treatment
log(o)	words, knowledge
-logist	specialist
-logy	study of, science of

path(o)	disease
-pathy	disease
pneum(o)	lungs, air
psych(o)	mind
ped(o)	child

nephr(o)	kidney
neur(o)	nerve
pneumon(o)	lungs
pulm(o)	lung
pulmon(o)	lung

Nephrologist: _____

Neurology: _____

Pulmonology: _____

Pathology: _____

Psychiatry: _____

Psychologist: _____

Medical Terminology Workout

a- without, not
an- without, not
adeno- gland
-ectomy surgical removal
-edma swelling
-emesis vomiting
-emia relating to blood
hem(a) blood
hem(o) blood
hemat(o) blood
ox(i) oxygen
ped(o) child, foot
pulmon(o) lung
-rrhage flow, discharge
-rrhagia flow, discharge
-rrhea flow, discharge

Hemorrhage: _____

Hematuria: _____

Hypoxemia: _____

Hypoxia: _____

Hematemesis: _____

Anoxia: _____

Pedal edema: _____

Pulmonary edema: _____

Edematous: _____

The Rrhea sisters: Dia, Meno, and Rhino – (dia = through, meno = month, rhino = nose)

Common Field Disorders and Clinical Manifestations (Differentials)

Hemorrhage (Internal/External)

Cyanosis or pale, cool, clammy skin
Tachycardia (might be profound)
Hypotension
Altered Mentation
Anxiety
Tachypnea

Common Extremity Injuries

Sprain (Ligaments torn)
Pain on movement
Tenderness to palpation
Swelling
Erythema
Unable to bear weight

Strain (Muscle/Tendon torn)
Immediate pain (may be described as burning)
Little Swelling or discoloration
Unable to bear weight

Fracture (fx)
Pain, tenderness to palpation
Possible deformity
Loss of function and/or distal circulation
Swelling
Ecchymosis/Erythema
Crepitus
Unable to bear weight

Dislocation
Pain
Deformity
Loss of movement or joint "locking"
Rigidity
Moderate to severe swelling

Head Injuries

Skull Fracture
Obvious deformity or visible damage to the skull
Pain, tenderness or swelling at the wound site
Battle's Sign (late)
Raccoon's Eyes (late)
Aniscoria (late)
Orbital "blowout"

Head Injury (Medical or Traumatic Cause)
Change in bone continuity or scalp lacerations
Aniscoria (Late)
Raccoon's Eyes (Late)
Battle's Sign (Late)
Facial Droop
Projectile Vomiting
Aphasia/Dysphagia
Ataxic Gait
Hemiparesis
CSF drainage (+ Halo Test)
Altered Mentation
Severe Headache
Incontinence
Priapism
Presence of Cushing's Triad:

- ↑ BP
- ↓ HR
- ↑ or erratic RR

Concussion (presentation depends on severity)
Loss of Consciousness with resulting confusion
Retrograde Amnesia
Mild to moderate irritability
Combativeness
Vomiting
Incontinence
Seizure

Cerebral Contusion
Loss of Consciousness with resulting confusion
Retrograde amnesia
Partial or total Paralysis
Aniscoria
Projectile Vomiting
Presence of Cushing's Triad
Profound Personality Change

Subdural Hematoma (SDH)
Progressive deterioration of mental status
Vomiting
Unilateral pupillary dilation
Presence of Cushing's Triad

Epidural Hematoma
Ebb and flow of consciousness that progressively deteriorates
During lucid periods, severe headache
Fixed and dilated pupil on impact side
Seizure

Common Field Disorders and Clinical Manifestations (Differentials)

Hemorrhagic CVA

(Leaking cerebral aneurysms present similarly)

Delayed onset (often hours)
AMS, personality change, combativeness
Presence of Cushing's Triad
Facial Droop or Ptosis
Aphasia/Dysphasia
Hemiparesis or weakness/tingling/numbness on one side
Ataxic gait
Loss of vision, diplopia or blurred vision
Incontinence
Nausea, vomiting
Tongue deviation

Ischemic CVA

Types: Embolic, Thrombic, Systemic Hypoperfusion or Venous Thrombosis

Rapid onset (often minutes)
AMS, personality change, combativeness
Presence of Cushing's Triad
Facial Droop or Ptosis
Aphasia/Dysphasia
Hemiparesis or weakness/tingling/numbness on one side
Ataxic gait
Loss of vision, diplopia or blurred vision
Incontinence
Nausea, vomiting
Tongue deviation

Transient Ischemic Attack (TIA)

Headache/dizziness or syncope
Difficulty performing familiar tasks or recognizing objects
AMS, personality change, combativeness
Presence of Cushing's Triad
Facial Droop or Ptosis
Aphasia/Dysphasia
Hemiparesis or weakness/tingling/numbness on one side
Ataxic gait
Loss of vision, diplopia or blurred vision
Incontinence
Nausea, vomiting
Tongue deviation

Symptoms typically resolve within 24 h but are indicative of a looming neurological event.

Cardiorespiratory Syndromes/Injuries

Myocardial Contusion

Generalized chest pain
Ecchymosis of chest wall
Tachycardia and/or dysrhythmia

Flail Chest

Paradoxical motion
Increasing airway resistance
Air Hunger
Guarding of chest wall
Subcutaneous Emphysema
Unilaterally diminished or absent breath sounds

Simple Pneumothorax

Sudden, sharp onset of chest pain
Dyspnea
Unilaterally diminished or absent breath sounds

Tension Pneumothorax

Severe progressive dyspnea
Unilateral chest wall movement
Cyanosis
Air hunger
Tracheal deviation (late)
Beck's Triad:

- JVD
- Muffled Heart Tones
- Narrowing pulse pressures

Retractions
Nasal Flaring
Shock due to obstructive cause
Hyperresonance to percussion

Hemothorax

Severe progressive dyspnea
Cyanosis
Unilaterally diminished or absent breath sounds
Dullness to percussion
Air hunger
Retractions
Nasal Flaring

Pulmonary Contusion

Severe dyspnea
Air hunger
Cyanosis
Retractions and nasal flaring
Rapidly developing shock

Cardiac Arrest

Unresponsive
Pulseless
Apneic
Cyanotic
Absent breath sounds and heart tones

Common Field Disorders and Clinical Manifestations (Differentials)

Pericarditis

Chest pain (radiation to the back)
Chest pain worsens when laying down and improves when leaning forward
Diffuse ST segment elevation in all leads except aVR and V1
Dry cough
Fever
Fatigue
Anxiety
Cardiac Tamponade
Congestive Heart Failure
Social history: check for recent dental work

Cardiac Tamponade

Dyspnea
Chest pain
Beck's Triad
Variable shock presentations due to obstructive cause

Acute Myocardial Infarction (AMI)

Substernal chest pain that may radiate to the left neck, arm and jaw
Described as pressure in lieu of pain
Dyspnea
Diaphoresis
Pale, cool, clammy skin
Cyanosis
Nausea, vomiting
Weakness, syncope, dizziness, anxiety
Upper Epigastric pain
Levine's sign
Dysrhythmia, tachycardia or bradycardia
AMS
Cardiac arrest

Angina

Substernal chest pain that may radiate to the left neck, arm and jaw
Described as pressure in lieu of pain
Dyspnea
Diaphoresis
Pale, cool, clammy skin
Cyanosis
Nausea, vomiting
Weakness, syncope, dizziness, anxiety

Stable Angina relieved with rest, Unstable Angina persists despite rest.

Subcutaneous Emphysema

Impaired breathing
Cyanosis
Raised, blister-like areas under the skin
Crackling sound with pressure to the affected area

Atypical MI Presentations (may be *some* of the following symptoms)

Little/no pain
Shortness of Breath
Syncope
Weakness
Indigestion
Confusion
Aching shoulders
Neurological symptoms
Any other anginal equivalents

Pulmonary Embolus

Pink, frothy sputum and cough
JVD
Fever
Pain in the muscles, joints, tendons
Mottling of involved extremity
Sudden onset of chest pain and dyspnea
Clear, wheeze or rhonchi heard upon auscultation
Subcutaneous emphysema
Slurred speech, Altered mental status
Cardiac Arrest
Social history: recent immobility, smoking in conjunction with oral contraceptive use, recent surgery

Deep Vein Thrombosis (DVT)

Mottling, edema, erythema, tenderness of involved extremity
Warmth in the involved extremity
Engorgement of superficial veins in involved extremity
Positive Homan's sign
Decreased pulse quality in involved extremity
Chest Pain
Social history: recent immobility, smoking in conjunction with oral contraceptive use, recent surgery

Traumatic Asphyxia

Exopthalmos
Scleral Petechiae
Facial Cyanosis
Hemoptysis
Shortness of breath, dyspnea
Laryngeal Edema

Common Field Disorders and Clinical Manifestations (Differentials)

Asthma
Tripod position
Dyspnea
Wheeze or "tight" breath sounds heard in bases, can be expiratory or inspiratory/expiratory
(Because of resonance, wheeze can displace into superior lobes)
Prolonged expiratory phase
"Sharkfin" capnograph
"Normal" tracheal sounds
Spasmodic, dry cough
Decreased air movement
Tachycardia
Air hunger
Social history: Home use of nebulizers, oxygen tanks or MDIs

COPD-Bronchitis
"Blue Bloater"
Productive cough with sputum
Sputum occasionally yellow or green or tinged with blood
Typically overweight because of sedentary lifestyle
Cyanosis
Wheezing, rhonchi in lung fields
Dyspnea on exertion (DOE)
Social history: careers in environments with occupational inhalation hazard, tobacco use

COPD-Emphysema
"Pink-Puffer"
Barrel chested, thin
Prolonged, difficult expiratory
Tripod position
Pursed-lip breathing
JVD
Peri-oral cyanosis
Flushed appearance
Breath sounds mixed: wheeze and rhonchi
Social History: careers in environments with occupational inhalation hazard, tobacco use, home use of oxygen, nebulizers or MDIs

R-sided Heart Failure
Clear breath sounds
Pitting Peripheral edema
JVD
Hypertension
Chest Pain
Ascites
Hepatomegaly

L-sided Heart Failure
Pink, frothy sputum
Harsh rales upon auscultation of lung fields
JVD
Diaphoresis
Dyspnea
Orthopnea
Increased work of breathing
S4 heart tones
Pulmonary edema
Cyanosis

Hyperventilation Syndrome
Air Hunger
Marked anxiety/panic
Carpopedal Spasms
Numbness/Tingling in the hands and feet
Chest tightness
Clear breath sounds
Tachycardia
Syncope

Croup
Characteristic and frequent "seal-bark" cough
Stridor
Hoarseness
Restlessness/Anxiety
Tachycardia
Cyanosis
Nausea, vomiting
Fever
Social history: Peak occurrence from 3 months to 3 years

Epiglottitis
Pain and difficulty swallowing
Marked fever (102-104 F)
Excessive salivation
Stridor
Changes in voice pitch/quality
Orthopnea
Tripod position
Chin thrust outward
Dysphagia
Quiet, shallow breathing
Cyanosis
Asphyxiation

Common Field Disorders and Clinical Manifestations (Differentials)

Inhalation Exposure
Severe headache
Nausea/Vomiting
Shortness of breath
Dyspnea
Chest pain, tightness
Burning, tearing eyes
Cyanosis
Cough, abnormal lung sounds
Facial, respiratory burns
Dizziness, deteriorating level of consciousness

Diaphragmatic Tear/Rupture
Bowel sounds auscultated in the thorax
Excessive coughing or yawning
Decreased breath sounds on affected side
Dyspnea
Chest or abdominal pain
Orthopnea
Upper epigastric or shoulder pain
Social history: recent blunt/penetrating trauma or surgery to the chest

Intra-abdominal Illness

Hollow Organ Pain
Crampy, colicky pain
Intermittent
Patients may prefer to walk around to relieve pain

Solid Organ Pain
Dull, constant pain
Patients prefer to be in the supine or fetal position

Splenic Injury
LUQ
Steady, dull pain (if capsule intact)
Sharp pain (if capsule ruptured)
Refers to left neck and shoulder
Can be accompanied by hemorrhagic shock

Appendicitis
Umbilical pain moving to RLQ (McBurney Point)
Abdominal bloating, diarrhea, constipation
Loss of appetite
Malaise
Fever

Cholecystitis
RUQ
Colicky, cramping pain
Refers to left shoulder or in between shoulder blades
Nausea, vomiting
Vomit may be severe and may progress to vomiting of bile
Fever

Pancreatitis
LUQ
Sudden onset of constant, severe pain
Pain may appear to be "boring through to the back"

Abdominal/Thoracic Aortic Aneurysm (AAA/TAA)
Medial in origin
Severe "tearing" pain
Longitudinal demarcation line
Mottling on involved side
Difference in pulse quality/blood pressure between sides
Severe chest pain or abdominal pain
Palpable abdominal mass

Intestinal Pain (Diverticulitis/Crohn's/ IBS, etc.)
Crampy, colicky pain that may be constant and dull or sharp
Abdominal bloating, distension
Nausea, vomiting
Diarrhea or constipation
Melena

Occult Liver disorder
Jaundice
RUQ and epigastric pain
Ocular icterus
Nausea, vomiting
Weakness, lethargy

Genitourinary Illness

Kidney Stones
Flank pain that may refer to the testis on the affected side in men
Colicky pain
Increased frequency in urination (but not output)
Fever, chills
Nausea, vomiting, abdominal distension
Hematuria
Loss of appetite, weight

Common Field Disorders and Clinical Manifestations (Differentials)

Spontaneous Abortion
Suspicion/Knowledge of pregnancy
Vaginal spotting/bleeding
Colicky pain in lower quadrants
Passage of tissue
Social history: Patient reports no fetal activity

Ectopic Pregnancy
Acute abdominal pain
Vaginal spotting
Sub-diaphragmatic pain that may refer to one or both shoulders
Tender, bloated, cramping abdomen on one side
Palpable abdominal mass
Weakness, Fever
Indications of hypovolemic shock
Social history: Missed menstrual cycle

Abruptio Placenta
Severe bleeding (may be occult)
Severe abdominal pain and rigidity
Signs of shock
Patient may describe "continuous" contractions

Placenta Previa
Sudden, painless vaginal bleeding that is light to heavy and bright red in color
Signs of shock
Labor-like pain

Ruptured Uterus
"Tearing" sensation in abdomen, which may have an hourglass appearance
Severe, localized pain
Vaginal bleeding
Nausea, vomiting
Cessation of noticeable uterine contractions

Prepartum hemorrhage
Moderate to severe vaginal bleeding
Shock

Urinary Tract Infection (UTI)
Dysuria, polyuria
Fever
Abdominal cramping in the hypogastric region
Decreased urine output despite increased frequency

Rape
Physical and psychological paralysis
Pain, bleeding or tearing from penetration
Physical signs of choking, gagging, restraint (ligature marks, bruises about the face and neck)
Hyperventilation, anxiety
Loss of consciousness
Nausea, vomiting

Preeclampsia
Hypertension
Pitting Edema
Sudden weight gain
Blurred vision/spots
Decreased urinary output
Severe, persistent headache
Persistent vomiting
Deteriorating level of consciousness
RUQ abdominal pain
Seizures (late)

Neurological and Endocrinological Illness

Dementia
Short-term memory loss
Decline in intellectual ability
Decline in judgment

Alzheimer's
Anorexia
Decrease in self-care ability
Regression
Marked decline in intellectual ability
Marked decline in judgment
Unfamiliarity with known people, places or objects
Social history: patient or residence may be in a profound state of disarray

Insulin Shock (Hypoglycemia)
ACUTE onset
Pale, cool, clammy, diaphoretic
Altered mental status, Dizziness
Snoring or sonorous respirations
Dilated pupils
Nausea, vomiting, hunger
Visual disturbances, alterations in mentation, combativeness
Slurred speech or dysphasia/ Patient may appear "drunk"
Decorticate or decerebrate posturing/Seizures (late)
Cardiac arrest

Common Field Disorders and Clinical Manifestations (Differentials)

Diabetic Ketoacidosis (DKA)
GRADUAL onset
Kussmaul's respirations
"Ketotic" or sweet, fruity odor
Diaphoresis with flushed, warm skin
3P's: Polyuria, polyphagia, polydipsia
Abdominal pain
Weakness fatigue
Generally alert and oriented but responsiveness can vary depending on severity and tolerance
Tachycardia
Can occur when CBG exceeds 250mg/dL

Hyperosmolar Hyperglycemic Nonketotic Syndrome (HHNS)
GRADUAL onset
Dry mouth
Extreme thirst
Warm, flushed, dry skin (NO sweating)
Loss of vision
Confusion, hallucinations
Fever (usually above 101 F)
Can occur when CBG exceeds 600mg/dL

Environmental/Traumatic Injuries

Spinal Injuries
Pain without movement
Obvious spinal deformity or vertebral step-off
Numbness, tingling, weakness of one or multiple extremities
Paralysis
Impaired breathing
Incontinence
Priapism
Demarcation line indicating neurologic shock
Concerns: Presence of distracting injury cannot equivocally rule-out spinal injury.

Hypothermia
Skin cold to touch
Shivering
Vague, slow, slurred speech
Amnesia, incoherence
Loss of fine motor control
Poor judgment, disorientation, coma
Ataxic gait making patient appear "drunk"
Skin color ranging from cyanosis to waxen
Sluggish pupils
Semi-rigid skin
Cardiac arrest

Heat Cramps
Severe muscular cramps, pain in large muscle groups
Hot, sweaty skin
Tachycardic but normotensive
Nausea
Dizziness

Heat Exhaustion
Headache, giddiness, weakness
Nausea, vomiting
Diaphoresis
Thirst
Brief periods of syncope
Tachycardia, tachypnea
Dilated pupils
Pale, cool, clammy skin
Heat cramps, aches
Ataxic gait
Visual and auditory disturbances
Temperature within normal limits or mild fever

Heat Stroke
Hot, reddish skin
Sweating mechanism ceases
Initially tachycardic and strong, progressing to bradycardia as damage continues unabated
Pupils initially constricted, then dilated
Tremors/Seizures
Deteriorating LOC/Coma
Initially tachypneic with deep pattern, eventually slowing as damage progresses
Headache
Nausea, vomiting
Hypotension
Marked fever

Black Widow Spider Bite
Hypertension, tachycardia
Flushing/Diaphoresis
Facial Grimace
"Pinprick" sensation at site
Pain/Spasms in shoulders, back, chest, abdomen (large muscle groups)
Fever/headache
Rash
Nausea, vomiting
Altered mental status, Syncope
Rigid abdomen or abdominal fasciculations
Chest Pain, respiratory difficulty

Common Field Disorders and Clinical Manifestations (Differentials)

Brown Recluse Spider Bite

"Flu-like" symptoms of fever, chills, joint pain within hours of the bite
Nausea, vomiting
Pain at site
Myalgias
"Bullseye" bite pattern
Itching

Coral Snake Bite

Tiny scratch marks
Little pain, swelling or discoloration
Blurred vision
Ptosis
Slurred speech
Salivation, diaphoresis
Drowsiness
Nausea, vomiting
Shock/coma
Dyspnea
Seizures/Paralysis
Total CNS shutdown

Pit Viper Bite

Immediate, severe burning, pain, discoloration and swelling at the site
Numbness/blistering around bite
Diaphoresis
Tachycardia, hypotension, tachypnea
Weakness, syncope
Numbness, tingling of mouth
Fever/chills
Fasciculations
Dimmed vision
Headache
Distinct puncture wounds

Contact Dermatitis (Poisonous Plant)

Fluid-filled, oozing blisters
Itching, burning
Swelling
Pain
Note: Poisonous plant irritations should "touch-transfer", they should not "creep" up an extremity. Creeping may indicate an infectious cause.

Absorbed Poisons

Burns, lesions, inflammation or heat at site
Itching, rash
Respiratory difficulty
Cardiac dysfunction

Poisonous Plant Ingestion

Intense burning of tongue or mouth
Nausea, vomiting
Diarrhea
Watering of mouth, nose and eyes
Diaphoresis
Weakness/Paralysis
Abdominal Pain
Hallucinations
Respiratory Depression
CNS depression
Seizures
Cardiac dysrhythmias

Ingested Poisons

Dilated or constricted pupils
Nausea, vomiting, diarrhea
Severe abdominal pain, distension
Salivation, "foaming" at the mouth
Peri-oral burns
Unusual breath
Deteriorating level of consciousness
Seizures

Shock

Hypovolemic

(body losing volume)
Pale, cool, clammy, diaphoretic
Hypotensive, tachycardia, tachypneic as decompensation mechanisms progress
External or occult blood loss
Nausea, vomiting
Anxiety, feeling of impending doom
Respiratory difficulty
Numbness, tingling in distal extremities
Deteriorating level of consciousness
Death

Neurologic

(systemic vasodilation due to disrupted synapses)
Demarcation line at injury site (cool, clammy, diaphoretic above; pink, warm dry below)
Pupillary disturbances (dilated or unilateral dilation)
Tachycardia, hypotension, tachypnea
Paralysis or hemiparesis
Altered mental status
Coma/Death

Common Field Disorders and Clinical Manifestations (Differentials)

Anaphylactic

(systemic vasodilation and increased capillary permeability)

Urticaria, Wheals or Petechiae
Angioedema
Tachycardia, hypotension, tachypnea
Persistent nausea, vomiting
Skin may be cool, clammy, diaphoretic and without rash
Wheeze upon auscultation
Respiratory difficulty, severe dyspnea
Altered mental status, coma, death

Septic

(systemic vasodilation and increased cellular permeability)

Purpura, petechiae or other rash
Fever
Tachycardia, hypotension, tachypnea
Nausea, vomiting, diarrhea
Joint pain
Altered mental status
Death

Obstructive

(Tamponade, PE, Tension Pneumothoraces)

Beck's Triad
Tachycardia, hypotension, tachypnea
Chest Pain
Respiratory difficulty
Breath sounds diminished or absent with tension pneumo, clear and present for tamponade
Air Hunger
Retractions
Death

Acid-Base Disturbances
*****Remember ROME*****
(Respiratory Opposite, Metabolic Equal)

Metabolic Acidosis

- Excess acid depletes bicarbonate or bicarbonate is lost by the kidneys as the primary disturbance.
- Hyperventilation lowers pCO_2, kidneys excrete more H^+ ions and retain more bicarbonate in order to compensate.
- Renal failure, ketosis, ASA poisonins and overproduction of lactic acid are the usual causes.
- $\downarrow$ pH $\downarrow CO_2$ $\downarrow HCO_3$

Respiratory Acidosis

- Results from an inefficient excretion of CO_2 by the lungs.
- The body compensates by retaining bicarbonate and H^+ excretion by the kidneys.
- Chronic pulmonary disease, drug depression of the respiratory center are the usual causes.
- $\downarrow$pH $\uparrow CO_2$ $\uparrow HCO_3$

Metabolic Alkalosis

- Resulting from excess plasma bicarbonate
- The body compensates by hypoventilating, which raises pCO_2 to acidify blood, kidneys increase H^+ retention and excrete HCO_3.
- Loss of gastric juice, chloride depletion, excess corticosteroid hormones, ingestion of bicarbonate or other antacids are the usual causes.
- $\uparrow$pH $\uparrow CO_2$ $\uparrow HCO_3$

Respiratory Alkalosis

- Resulting from hyperventilation, which lowers pCO_2.
- The body compensates by increasing the excretion of bicarbonate and retaining H^+ in the kidneys.
- Severe anxiety with hyperventilation, CNS disease, hypoxia and pulmonary imbalances are the usual causes.
- $\uparrow$ pH $\downarrow CO_2$ $\downarrow HCO_3$

Common Field Disorders and Clinical Manifestations (Differentials)

Electrolyte Imbalances

EXCESS	***DEFICIT***
Sodium (136 to 145mEq/L)	
Hypernatremia	*Hyponatremia*
>147 mEq/L	*<135mEq/L*
Cellular shrinking causes CNS irritability	Cellular swelling causes cerebral edema,
Tachycardia	Headache, stupor, coma,
Dry, flushed skin	Peripheral edema
Hypertension	Nausea, vomiting
Thirst	Polyuria, absence of thirst
Elevated temperature	Decreased body temperature
Weight loss, anuria	Tachycardia, hypotension
Potassium (3.5 to 4.5 mEq/L)	
Hyperkalemia	*Hypokalemia*
>5.5 mEq/L	*<3.5 mEq/L*
Depressed myocardial conductivity	Cardiac irritability
Muscle cramping	Dysrhythmias
Paresthesias	Vomiting, thirst,
Nausea, Diarrhea	Paralytic ileus
Metabolic Acidosis	Metabolic Alkalosis
Calcium (8.6 to 10.5 mg/dL)	
Hypercalcemia	*Hypocalcemia*
>12 mg/dL	*<8.5 mg/dL*
Decreased neuromuscular excitability	Increased neuromuscular excitability
Muscle weakness	Skeletal muscle cramps
CNS depression	Tetany
Stupor to coma	Laryngospasm
Increased risk of fractures	Asphyxiation
Vomiting, constipation	Death
Kidney stones	
Magnesium (1.8 to 2.4 mEq/L)	
Hypermagnesemia	*Hypomagnesemia*
>4.5 mg/dL	*<1.5 mEq/L*
Skeletal muscle depression	Hypcalcemia and hypokalemia
Muscle weakness	Neuromuscular irritability
Hypotension	Tetany
Bradycardia	Convulsions
Respiratory depression	Tachycardia
	Hypertension

Los Angeles County Emergency Services Agency

EDUCATIONAL CONTENT TERMINOLOGY VARIANCES & REMINDERS
NATIONAL DOT CURRICULUM OR TEXTBOOKS vs LOS ANGELES COUNTY SCOPE OF PRACTICE

EDUCATIONAL CONTENT	NATIONAL DOT CURRICULUM TEXTBOOKS	LOS ANGELES COUNTY SCOPE OF PRACTICE
Abdominal Evisceration	1. Cover organs with moist sterile dressing then apply an additional dry dressing and tape all 4 sides -- *no variance* 2. Cover visceral with plastic wrap (non-adherent) and tape all 4 sides to ensure an airtight seal. -- *no variance*	Difficult to obtain a non-adherent dressing in the field. Generally not carried by EMS personnel. Best method would be to use moist dressing and then cover with an additional dry dressing.
Administration of oxygen in patients with chest pain	American Heart Association recommends 4L/minute of oxygen via nasal cannula. National Registry uses AHA standards.	Los Angeles County recommends high flow oxygen via mask unless patient is unable to tolerate mask then administer 5-6 Liters via nasal cannula.
AED for Pediatrics	Some textbooks state that AEDs may be used for pediatric patient 8-years-of-age and above. The current American Heart Association guidelines in the ECC document for 2005 state that AEDs could be used for infants to 8 years of age. National Registry uses AHA standards.	Los Angeles County had previously used the criteria for 8-years-of-age or above, or if longer than the Broselow tape. This was changed November 2004, to include 1-year-of-age and above, using pediatric pads or an attenuator that decreases the joules delivered by the AED. In 2007 the Los Angeles Medical Council voted that AED defibrillation for infants was acceptable using pediatric pads or an attenuator that decreases the joules delivered by the AED.
Airway Management Techniques – Open mouth – Scissors technique	The scissors technique is being taught to open the mouth for inserting an oropharyngeal airway.	Never insert fingers in the mouth. This can result in patient biting down or tearing gloves on teeth. Use another OPA to open mouth if necessary to insert an OPA.
Alcohol	Limited information available regarding alcohol poisoning and withdrawal	Need to place greater emphasis on alcohol abuse. Alcohol is the number one abused drug in the United States.
Amputated body parts – care of	Some sources state to wrap in dry sterile dressing and others in moist saline dressings.	Use only dry sterile dressing and put in water tight bag. Place bag on ice or in cold/ice water. Avoid direct contact of amputated part with ice. Moist dressings macerate tissue and may cause problem with re-implantation.
Artificial ventilation – order of preference	1. Mouth-to-mask 2. Two-rescuer bag-valve-mask 3. Flow restricted, oxygen-powered ventilation device 4. One-rescuer bag-valve-mask	1. Two-rescuer bag-valve-mask 2. One-rescuer bag-valve-mask 3. Mouth-to-mask (pocket or recue mask) 4. Flow restricted, oxygen-powered ventilation device. – Only used by some agencies/departments. *NOT to be used in chest trauma.*

EDUCATIONAL CONTENT	NATIONAL DOT CURRICULUM TEXTBOOKS	LOS ANGELES COUNTY SCOPE OF PRACTICE
Artificial ventilation formula – flow rates and volume delivered	Discuss minimum flow rates and volumes delivered 1. Using a mouth-to-mask device <u>without supplemental oxygen</u>, breaths should be delivered at 10ml/kg or average of 700-1000ml over a 2 second period. 2. Using a mouth-to-mask device <u>with supplemental oxygen</u>, breaths should be delivered at 6-7ml/kg or average 400-600ml over a 1-2 second period which reduces the chance of gastric inflation. 3 In pediatric patients, breaths should be delivered a 6-7ml/kg (no average available since weight range varies significantly).	Need to place greater emphasis flow rates and volume delivered.
Burns – transport	Cool burns initially with sterile normal saline then apply dry sterile dressing, <u>DO NOT</u> transport with moist dressings above burns that are 20% or greater. Transport to burn center if meets criteria.	Cool burns initially with sterile normal saline then apply dry sterile dressing, <u>DO NOT</u> transport with moist dressings. <u>DO NOT</u> transport to burn centers, but to appropriate facility, either the most accessible hospital or trauma center if patient meets trauma center criteria.
Child Birth 1. Position 2. Knee-chest position in prolapsed cord	1. DOT Curriculum addresses mother being either in semi-Fowler's or supine position. Some text show mother in a semi-fowler's position with knees flexed and apart – *<u>no variance from L.A. skill sheet</u>* 2. Alternative given is to elevate mother's hips or place her in the knee-chest position for prolapsed cord.	1. Either Semi-Fowler's or the supine position may be used depending on circumstances. 2. Placing the mother in a knee-chest position is extremely embarrassing to the mother. It does not help get pressure off the cord and may be dangerous to the mother, baby and the provider, going code 3.
Child Birth 1. Umbilical cord – clamping 2. Umbilical cord – cutting	1. Place 1st clamp 1" from newborn and 2nd clamp 2" away from 1st clamp (3" from newborn). Some texts state clamp anywhere from1" - 6" from mom. 2. Some text state that one should wait until the cord stops pulsating before clamping and cutting the cord.	1. Place 1st clamp 6" from newborn and 2nd clamp 2" away from 1st clamp (8" from newborn). This allows access to umbilical veins if needed and also allows for re-clamping if indicated. The most important thing is to make sure that until the cord is clamped the baby is held at the level of the vagina. If it is held above the level of the vagina, the baby loses too much blood back into the cord and if held below the vagina, this may result in over loading the baby with blood. 2. Waiting until the cord stops pulsating is not necessary. Clamping the cord and cutting it should be done after the baby' mouth and nose are suctioned and the airway is clear.

EDUCATIONAL CONTENT	NATIONAL DOT CURRICULUM TEXTBOOKS	LOS ANGELES COUNTY SCOPE OF PRACTICE	
Eye injuries 1. Puncture wound or impaled object 2. Chemical burns	Patch both eyes	Patch only affected eye. Patching both eyes results in the increase in patient anxiety due to not being able to see and does not prevent the affected eye from moving.	
Cooling measures 1. Fever 2. Heat Stroke	1. Active cooling measures for fever. 2. Active cooling measures for heat related situations -- *no variance*	1. Passive cooling measures for fever only. Children may experience a febrile seizure when the temperature rises quickly. When the child is cooled rapidly and no antipyretic medication is given (fever reducing medication) the temperature may spike rapidly. Also, with active cooling measures the child shivers which again raises their temperature. 2. Active cooling measures for heat related situations. Patients no longer have the ability to regulate their temperature and need to be cooled rapidly to prevent brain damage and organ failure.	
Flail chest management	1. Splint the flail segment to the rest of the thoracic cage by using manual pressure. 2. Tape a bulky dressing from one side to the other side. 3. Place patient on backboard with the injured side down (affected side). 4. Tape a padded board over the segment.	1. Initially splint flail segment by using manual pressure until able to complete splinting for transport. 2. Tape bulky dressing from one side to the other side. 3. DO NOT place patient on backboard with the injured side down. If the mechanism of injury had enough force to cause a flail segment, spinal injury may also have occurred and spinal immobilization is indicated. 4. DO NOT tape a padded board over the segment.	
Food poisoning	Incorporate various types of food poisoning	Need to place greater emphasis on types of food poisoning.	
Glasgow Coma Scale	Scale: Eye Opening Verbal Response Motor Response *Normal Report = 4-5-6*	Scale: Eye Opening Motor Response Verbal Response *Normal Report = 4-6-5*	The scale order was changed on the LA County EMS "Patient Care Record" and is documented and reported verbally to hospital personnel using the EMV order.
Hazmat placards/classification system	Class 1 Explosives Class 2 Gases Class 3 Flammable liquids and combustibles liquids Class 4 Flammable solids/spontaneous combustibles/dangerous-when-wet materials Class 5 Oxidizers and organic peroxides Class 6 Toxic materials and infectious substances Class 7 Radioactive materials Class 8 Corrosive materials Class 9 Miscellaneous dangerous goods	Need to place greater emphasis on hazard classification system.	

EDUCATIONAL CONTENT	NATIONAL DOT CURRICULUM TEXTBOOKS	LOS ANGELES COUNTY SCOPE OF PRACTICE
Insect Bites and Stings	Use constricting band above and below site	Constricting bands NOT used in L.A. County for bites and stings. Extremities should be immobilized and kept below the level of the heart.
Insect Stinger or Venom Sac -- Removal	1. Remove with a stinger by scraping stinger out with an object such as a plastic card. 2. Pinch stinger or venom sac between thumb and forefinger and remove (recent study shows that this is acceptable). – *no variance*	***Most importantly the stinger and sac need to be removed quickly***. The stinger of a honey bee must be removed as rapidly as possible. Remove the barb by pinching or pulling it out as soon as possible, no need to scrap out with a stiff object. The honey bee is the only insect where the stinger is barbed and is not withdrawn when the insect flies away and the barb can inject venom up to 20 minutes resulting in severe systemic reaction. Remove the patient from area as soon as possible since pheromones are released which will attract other bees.
Log Roll – rescuer who gives command	Rescuer at the patients head	Rescuer at the patient's head or chest may give command. The preferred method is that the rescuer at the chest gives the command since the torso is the heaviest part of the body and this person needs to be ready to roll the patient. Both methods are acceptable, but it must be made clear on scene as to ***who is responsible to give the command to roll the patient.***
Medical Control	Contact Medical Control for on-line medical direction	No capability in LA County for EMTs to receive on-line medical direction. Ref. 802: EMT-I Scope of Practice provides for off-line medical direction only.
Medications 1. Bronchodilator inhaler 2. Epinephrine Autoinjector 3. Nitroglycerin 4. Oral Glucose 5. Activated Charcoal	Use with medical control direction 1. Bronchodilator inhaler -- *No variance* 2. Epinephrine Autoinjector-- *No variance* 3. Nitroglycerin -- May give 3 doses and BP must be 90 mmHg systolic 4. Oral Glucose -- *No variance* 5. Activated Charcoal -- Able to administer if directed by medical control	No on-line medical control available in LA County. Allows for assisting with medications by off-line medical control direction - Policy 802.2 -L. A County EMT-I Expanded Scope of Practice. 3. Nitroglycerin -- May give ONLY 1 dose, but none may be administered if the if patient has already taken 3 doses or BP is below 100mmHg. 4. Oral Glucose – Is the only medication that can be carried by EMTs. 5. Activated Charcoal -- Not used in L.A. County.
Medications – Nebulizer and Breathing Machines	Some text state and illustrate the administration of bronchodilators via nebulizers and breathing machines.	EMTs may assist the patient with using a nebulizer, but may not add the medication to the device. Adding the medication must be done by the patient or caregiver. This is due to multidose medications, drawing up medications, and calculating dosages is not in the expanded scope of practice for EMTs.
Newborn - assessment	APGAR is part of the newborn assessment	Los Angeles County does not require an APGAR to be done, because it delays the care and sometimes transport. However, if the EMT chooses to do an APGAR and document it, this provides a clearer picture of the newborn.
Oxygen Administration Mask	Most text and DOT state that liter flow rate is 8-15 when administering O2 via mask.	Los Angeles County states high flow oxygen at 10-15 liter should be administered if patient is able to tolerate it.

EDUCATIONAL CONTENT	NATIONAL DOT CURRICULUM TEXTBOOKS	LOS ANGELES COUNTY SCOPE OF PRACTICE
Pharmacology	Activated Charcoal may be used	Activated Charcoal must be taught, but not in the L. A. County scope of practice.
Pneumatic Anti-Shock Garment (PASG) - MAST Suit	Used for pelvic stabilization and long bone fractures of the lower extremities – *no variance*	Most providers no longer carry a MAST Suit. If carried on rescue vehicle it may be used for pelvic stabilization and long bone fractures of the lower extremities.
Poison Control	Contact poison control for direction	Currently not able to contact poison control for direction. Rapid patient transport is indicated.
Poisonous Plants	Various types of poisonous plants	Need to place greater emphasis on poisonous plants.
Positive Pressure Ventilation	Reminder Positive Pressure consists of: 1. Mouth-Mouth ventilation 2. Mouth to Mask ventilation 3. Bag-valve-mask ventilation 4. Oxygen breathing devices	These are all methods that actively ventilate a patient. Mouth-Mouth is still the best method, but is not used in prehospital setting. All providers should at least carry a pocket mask.
Primary Assessment –Counting pulse and respirations	Most text give the impression that pulse and respirations are counted here by providing information of vital signs in scenarios presented.	Pulse and respirations are not counted in the primary assessment. Should only be noted as normal, fast or slow. Complete pulse and respiratory counts a done during the secondary assessment.
Realignment of bones 1. Wrist 2. Angulated fractures 3. Long bones	Suggest realigning all bone fractures 1. If compromised circulation to hand – *no variance* 2. Realign all angulated fractures if unable to splint – *no variance* 3. Long bones – if compromised circulation.	Realign bones only if compromised circulation, nerve function, or unable to splint in position found. ***DO NOT realign joints***.
Restraints	Prone position for restraining patients	Placing a restrained patient in a prone position is not an accepted practice and prohibited by Ref. 838 – Application of Patient Restraints. The prone position may result in positional asphyxia and death.
Shock	Types of shock not mentioned in DOT Curriculum except to define as hypoperfusion. Various Text include: Anaphylactic Cardiogenic Hypovolemic/Metabolic (loss of fluid and electrolytes) Neurogenic/Vasodilatory (vasogenic) Psychogenic Septic	Types of shock: Hypovolemic -- includes metabolic Cardiogenic Distributive Obstructive Distributive shock includes anaphylactic, neurogenic, psychogenic and septic shock as sub-classifications.
Snake Bites	Use constricting band above and below site	Constricting band not used in L.A. County for snake bites.

EDUCATIONAL CONTENT	NATIONAL DOT CURRICULUM TEXTBOOKS	LOS ANGELES COUNTY SCOPE OF PRACTICE
Spinal Immobilization	May place chin strap over the chin.	In Los Angeles County, placing the chin strap over the chin is not recommended because the patient may not be able to open the mouth in case of vomiting. Extremities should be immobilized and kept /below the level of the heart.
Sucking Chest Wound	Some text state to seal 3 or all 4 sides.	Los Angeles County teaches to apply an occlusive dressing and seal only 3 sides.
Traction Splint	Use on mid-shaft femur fractures	May also be used on mid-shaft tibial/fibula factures as long as all leg joints are not involved. Used only in tibial/fibula fractures if there is circulatory and/or neurological compromise.

Developed:1/06 Revised:12/07, 12/08, 1/10

TERMINOLOGY VARIENCES

Word/Phrase	Current Terminology
Frostbite	Cold injury
O-ring	Flexible gasket

This document is updated whenever a discrepancy is found in the National Standards or in textbooks that may be different from the practice in Los Angeles County or concepts that should receive more focus during the training program.

Section 2:
Patient Assessment

MEDICAL CONTROL GUIDELINE: ALTERED LEVEL OF CONSCIOUSNESS

PRINCIPLES:

1. Evaluation and documentation of the patient's level of consciousness are key components of a thorough patient assessment.

2. Signs and symptoms of altered level of consciousness (ALOC) may present as disorientation to person, place or time; confusion; lethargy; impaired cognition; coma; inappropriate aggressiveness; or hostility. These findings should alert EMS personnel to the possibility that the patient may have a serious underlying medical condition.

3. The patient's baseline level of consciousness should be taken into consideration when evaluating whether the ALOC finding represents an acute change or is normal for the patient.

GUIDELINES:

1. Assess orientation by asking the patient the following:
   a. Name
   b. Where they live/where they are
   c. Day of week/year/time of day

   Patients unable to reasonably answer one or more of the above shall be considered to have ALOC.

2. Utilize the appropriate Glasgow Coma Scale (GCS) to assess the neurological status of all patients. Report and document the GCS in the following order: eye opening, verbal response, and motor response.

	Adult	Child (1-4 yrs.)	Infant
EYE OPENING			
4	Spontaneous	Spontaneous	Spontaneous
3	To voice	To voice	To voice
2	To pain	To pain	To pain
1	None	None	None
VERBAL RESPONSE			
5	Oriented	Oriented	Smiles and coos appropriately
4	Confused	Confused	Cries and consolable
3	Inappropriate	Inappropriate	Persistent inappropriate crying and/or screaming
2	Incomprehensible	Incomprehensible	Grunts or is agitated or is restless
1	None	None	None
MOTOR RESPONSE			
6	Obedient	Obedient	Spontaneous
5	Purposeful	Localized	Localized
4	Withdrawal	Withdrawal	Withdrawal
3	Flexion	Flexion	Flexion
2	Extension	Extension	Extension
1	None	None	None

NOTE: For patients unable to communicate or patients with a language barrier, estimate appropriateness of motor response, obedience, and verbal response by consulting with the family and/or primary caregiver(s), if applicable.

MEDICAL CONTROL GUIDELINE: PERFUSION STATUS

PRINCIPLES:

1. Perfusion status is determined by a combination of parameters that includes heart rate, blood pressure, tissue color and mentation. No one parameter alone can be used to determine perfusion status.

2. Adequate perfusion is defined as adequate circulation of blood through organs and tissues, manifested by normal pulse, tissue color, level of consciousness and blood pressure.

3. Poor perfusion is defined as inadequate circulation of blood through organs and tissues manifested by vital sign abnormalities and/or signs and symptoms of organ dysfunction.

4. Base hospital contact should be initiated on patients who are hypotensive and/or those who have poor perfusion.

GUIDELINES:

1. EMS providers should evaluate for the following signs and use clinical judgement to determine poor perfusion status, which may include but not limited to:

    a. Adult systolic blood pressure (SBP) less than 90mmHg, pediatric SBP less than 70mmHg

    b. Bradycardia, tachycardia and/or poor pulse quality (weak/thready)

    c. Altered mental status (including anxiety, restlessness, lethargy, combative behavior)

    d. Delayed capillary refill time (greater than 2 seconds) and/or changes in tissue color including pallor, cyanosis or mottling

MEDICAL CONTROL GUIDELINE: PAIN ASSESSMENT

PRINCIPLES:

1. All patients with any complaint of pain shall have an appropriate pain assessment and management.

2. An accurate and thorough pain assessment requires initial and ongoing assessments be performed and documented.

3. Measurement of a patient's pain is subjective; therefore, the patient best determines the presence and severity of their pain.

4. Recording a pain level using a pain scale provides health care providers with a baseline against which to compare subsequent evaluations of the patient's pain.

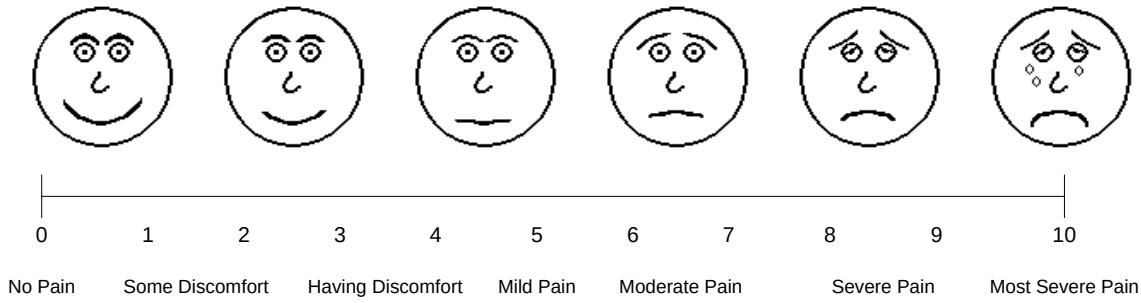
5. Los Angeles County utilizes the "Numeric Pain Intensity", the "Facial Expression", and FLACC (Face, Legs, Activity, Cry and Consolability) Behavioral Tool pain scales.

GUIDELINES:

1. Perform an initial pain assessment including:
   a. Onset
   b. Provoked
   c. Quality
   d. Region, Radiation and Reoccurrence
   e. Severity – Scale/Intensity
   f. Time/Duration

2. Use the Numeric Pain Intensity scale by asking the patient to rate their pain on a 0-10 scale; zero (0) equals no pain and ten (10) equals the most severe pain. Document the number selected on the EMS Report Form.

3. Use the Facial Expression pain scale if unable to use the Numeric Pain Intensity scale.



4. Utilize the FLACC Behavioral Tool for children less than 3 years of age or those with cognitive impairments or any child who is unable to use the other scales. The patient is assessed in each of the categories with a score applied to behaviors being evaluated. The five scores are totaled and the severity of pain determined based on the 0-10 pain scale.

Behavior	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant frown, clenched jaw, quivering chin
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, tense, shifting back and forth, hesitant to move, guarding	Arched, rigid or jerking, fixed position, rubbing of body part
Cry	No cry/moan (awake or asleep)	Moans or whispers, occasional cries, sighs or complaint	Cries steadily, screams, sobs, moans, groans, frequent complaints
Consolability	Calm, content, relaxed, needs no consoling	Reassured by hugging, talking to, distractible	Difficult to console or comfort

5. Reassess the patient's pain frequently and after any intervention. Document the reassessment of pain on the EMS Report Form.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

PATIENT ASSESSMENT / VITAL SIGNS
RESPIRATIONS / BREATHING

PERFORMANCE OBJECTIVES
Demonstrate proficiency in performing an accurate respiratory assessment.

CONDITION
Perform an accurate respiratory assessment for the primary and secondary assessment. The examiner will assess respirations with the examinee to determine the accuracy of the assessment. Necessary equipment will be adjacent to the patient.

EQUIPMENT
Live model, timing device, stethoscope, eye protection, mask, gown, gloves.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.
- Reading must be within +/- 2 breaths/minute of examiner's determination.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions ** ***Place a surgical mask on the patient and use an N95 respirator on self- <u>if suspected airborne disease</u>***	• Mandatory personal protective equipment - gloves

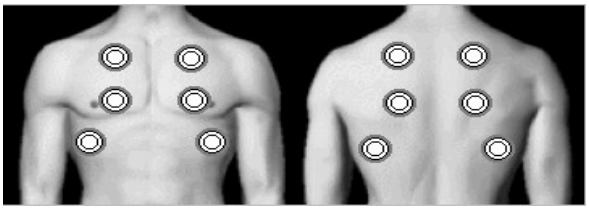
PRIMARY ASSESSMENT	
Skill Component	**Key Concepts**
♦ Consider the need for additional BSI	• Situational - goggles, mask, gown • Surgical masks are to be used on patients when airborne diseases are suspected. • Surgical masks provide only droplet containment with little filtration protection. • N95 respirators on provider provide higher levels of protection. • When an outbreak occurs, PPE guidance will be provided by the local health officials.
♦ Observe or feel for rise and fall of chest or abdomen	• Evaluate the patient's respirations as subtly as possible. Patients have a tendency to increase their respirations if they know they are being assessed. • The rescuer may have to feel the patient's chest or abdomen to check for rise and fall if tidal volume is decreased or patient is dressed in a large jacket or many layers of clothing. Lay patient's arm over chest or abdomen, watch movement of shoulders, etc. • Infants are "abdominal breathers" which causes the abdomen to protrude and the chest wall to retract. **NOTE: THIS IS A NORMAL FINDING.**
♦ Assess respirations/Manage breathing: • Rate (normal, fast, slow) • Effort/Quality • Tidal volume • Rhythm/Pattern ** ***Administer O_2 per Los Angeles County Reference No 1302*** ** ***Provide positive pressure ventilation with a BMV- <u>if inadequate ventilation</u>***	• <u>Rate</u> - determine if fast or slow. The rate is not counted during the primary assessment. • <u>Effort/Quality</u> – Is evaluated by the presence of accessory muscles use ~~of~~, patient position (tripod, reclined, etc.), clear or diminished sounds, equal or unequal, labored, noisy, absent, and the ability to speak in complete sentences, or unable to due to being short of breath. • <u>Tidal volume</u> – Must be determined if it is normal, adequate, shallow, increased or decreased.

	Continued… • Determine if the tidal volume and rate are adequate to assure effective ventilation - use BMV to increase tidal volume or rate if necessary. • A goal of oxygen administration is to deliver the minimum amount of oxygen to meet the needs of the patient and to maintain a SpO_2 at or above 94-98%. • When available, use pulse oximetry to guide oxygen delivery. The desired SpO_2 for most non-critical patients is 94-98%. • **SPECIAL CONSIDERATION:** For chronic obstructive pulmonary disease (COPD), the goal is to titrate oxygen to keep the SpO_2 at 88-92%.
♦ Assess breath sounds (rapid chest auscultation) - *if difficulty breathing or shortness of breath*	• Assess only 1-2 breaths to confirm presence and equality of breath sounds at 5th - 6th intercostal space mid-axillary line on each side of the chest.

SECONDARY ASSESSMENT

Skill Component	Key Concepts
♦ Observe or feel for rise and fall of chest or abdomen	
♦ Assess/Manage breathing: • Rate (respirations/minute) • Effort/Quality • Tidal volume • Rhythm/Pattern (regular/irregular) ** ***Consider O_2 therapy*** ** ***Consider BMV- if inadequate ventilation*** ** ***Place a surgical mask on patient and use an N95 respirator on self- if suspected airborne disease and not already done***	• Rate can be calculated by counting for 30 seconds and multiplying by 2. Abnormal pattern should be counted for 1 full minute. • Respiratory rate >40 or <10 may not provide adequate tidal volume. Be prepared to assist with bag-valve-mask ventilation if level of consciousness is decreased. • Respiratory rhythm assessed is either regular or irregular. • Respiratory pattern is determined after complete assessment and may include any of the following: - normal - sighing - Biot's - bradypnea - Cheyne-Stokes - ataxic - tachypnea - Kussmaul - air-trapping - agonal - hyperventilation (hyperpnea)
♦ Assess breath sounds (3 bilateral anterior or posterior fields) - *if difficulty breathing or shortness of breath*	• Breath sounds are assessed in three (3) bilateral anterior or posterior fields; apices, mid-lung, and bases.

RE-ASSESSMENT/DOCUMENTATION
(Ongoing Assessment)

Skill Component	Key Concepts
§ Repeat respiratory assessment a minimum of every five (5) minutes for unstable patients or 15 minutes for stable patients. • Re-assess/Manage breathing: • Rate (respirations/minute) • Effort/Quality • Tidal volume • Rhythm/Pattern (regular or irregular) • Re-assess breath sounds (3 bilateral anterior or posterior fields) - if difficulty breathing or shortness of breath • Consider BMV - if inadequate ventilation	• An unstable patient is one who have abnormal vital signs, S/S of poor perfusion, or if there is a suspicion that the patient's condition may deteriorate. • Re-assess full breath sounds whenever there is a change in patient's condition or respiratory pattern. 

PATIENT REPORT AND DOCUMENTATION	
Skill Component	**Key Concepts**
§ Give patient report to equal or higher level of care provider **Exception**: *Report may be given to a lower level of care provider when an ALS to BLS downgrade has occurred*	• Report should consist of all pertinent information regarding the assessment findings, treatment rendered and patients response to care provided.
§ Verbalize/Document: • Respiratory assessment: - rate (respirations/minute) - effort/quality - tidal volume - rhythm/pattern (regular or irregular) • SpO_2 • Breath sounds • Oxygen administration: - airway adjunct/ventilatory devices used - oxygen liter flow - ventilation rate	• Respiratory rate, tidal volume, rhythm/pattern and breath sounds should be reported and documented. • Airway adjuncts and ventilatory devices are mechanical aids that assist in maintaining a patent airway, ventilating or delivering oxygen. These adjuncts/devices include: oxygen mask, nasal cannula, oropharyngeal and nasopharyngeal airway, bag~~-valve-~~mask-ventilation device, a tracheostomy, endotracheal or esophageal combitube, etc. • Documentation must be on either the Los Angeles County EMS Report, ePCR, or departmental Patient Care Record form.

Developed 3/02, Revised 10/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

PATIENT ASSESSMENT / VITAL SIGNS
RESPIRATIONS / BREATHING
Supplemental Information

DEFINITIONS:

- Accessory muscles – Are the muscles used when a patient has difficulty breathing. They include the shoulder muscle (trapezius), neck muscles (sternocleidomastoid and scalenus), chest muscles (pectoralis and intercostals), and abdominal muscles.
- Dyspnea – Is the subjective feeling of shortness of breath. It is usually associated with heart or lung disease, but also occurs normally with intense physical activity or at high altitudes.
- Inspiratory-Expiratory ratio (I.E. ratio) - This ratio is the time of inspiration to the time of expiration. The active inhalation phase lasts 1/3 the time of the passive exhalation phase. It takes longer to exhale than to inhale. If the rate of breathing increases, the ratio may change to 1:2 or 1:1 depending on the rate. In patients with COPD and asthma, air trapping occurs and to exhale completely the ratio may increase to 1:4.
- Respiration (ventilations) - In normal breathing each breath includes 2 phases; inspiration and expiration
- Respirator – N95 or higher filters protect the healthcare provider from breathing in small particles which may contain viruses. They must be fitted to the face so that most air is inhaled through the filter material. N95 are disposable and should only be used once.
- Tripod position – The patient is in a high-fowlers sitting position with the patient leaning forward on both arms allowing for accessory muscles (pectoralis minor and major) to elevate the rib cage resulting in maximum chest expansion and diaphragmatic function. In addition, a patient in respiratory distress places his head and neck in a natural sniffing position that aligns the larynx and trachea allowing for better air flow.

NOTES:

- The amount of air exchange is dependent on the rate and the tidal volume.
- An adult patient breathing slower than 10 breaths/minute or faster than 24 breaths/minute should be evaluated for inadequate breathing. The pulse oximetry reading is helpful in this situation.
- Signs of respiratory distress:
  - Respiratory rate < 10 breaths/minute or > than 24 breaths/minute
  - Accessory muscle use
  - Intercostal and sternal retractions
  - Pale, cyanotic, or cool (clammy) skin
  - Abnormal I:E ratio
  - Abnormal respiratory pattern
  - Decreased, unequal or abnormal lung sounds
  - Labored breathing
  - Shallow or uneven chest rise and fall
  - Unable to speak in complete sentences between breaths (only 2-3 words at a time)
- Facemasks and N95 respirator are to be used in cases of suspected airborne diseases such as:

  Pandemic Flu season
  Plague
  Severe Acute Respiratory Syndrome (SARS-CoV)
  Tuberculosis (TB)
  Pertussis (Whooping Cough)

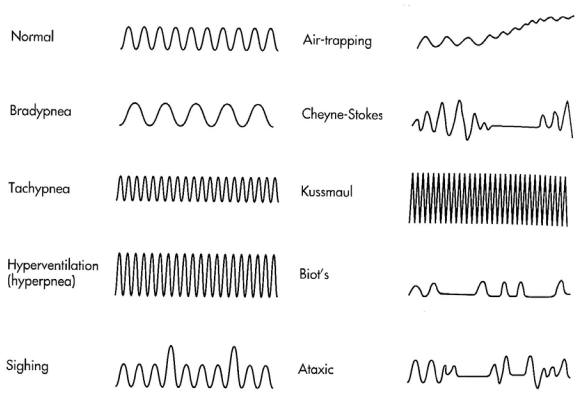
RESPIRATIONS / BREATHING

Supplemental Information (Continued)

Tidal Volume	Normal Respiratory Rates	Accessory Muscles
Normal/Adequate Increased Shallow (decreased)	Adults 12-20 Child 15-30 Infants 25-50 Newborn 30-60	***Adults*** • Trapezius (shoulder) *[assist with inspiration]* • Sternocleidomastoid (neck) *[assist with inspiration]* • Scalenus (neck) *[assist with inspiration]* • Abdominal *[assist with expiration]* ***Pediatric*** • Intercostal retractions • Sternal retractions ***"Children retract in severity from the bottom up"***

Type of Respirations	Characteristics	Possible Cause
Normal/Adequate	Breathing is ordinary - neither deep or shallow	Normal respirations
Shallow	Slight movement of the chest or abdomen	Respiratory depression, chest wall injury, pleuritic pain
Labored	Increased effort of breathing, use of accessory muscles, *nasal flaring, *intercostal retractions, sternal retractions* * mostly seen in infants and children	Respiratory insufficiency and failure ***(In infants and children, cardiac arrest is most commonly caused by respiratory arrest)***
Noisy	Snoring, wheezing, gurgling, crowing and stridor	Partial airway obstruction from a foreign object, swelling, neck position, fluid in the lungs, or constriction of the airways

Respiratory Patterns



Graph obtained from Saunders, Paramedic Textbook 2nd ed. Fig. 11-13

Respirations	Definition
Eupnea	Normal breathing
Bradypnea	Slower than normal rate
Apnea	No breathing
Tachypnea	Faster than normal rate
Hyperventilation (hyperpnea)	Increased rate and/or depth (faster and/or deeper than normal respirations)
Ataxic	Irregularly - irregular
Biot's	Irregular with periods of apnea (similar to but not as regular as Cheyne Stokes)
Cheyne-Stokes	Regular increase and decrease in depth followed by a period of apnea
Kussmaul	Rapid, regular deep respirations caused by diabetic ketoacidosis or other metabolic acidosis
Central Neurogenic Hyperventilation	Pattern similar to Kussmaul but caused by increased intracranial pressure (head injury)
Air trapping	Prolonged but inefficient expiratory effort, commonly seen in COPD or asthma

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

PATIENT ASSESSMENT
CHEST AUSCULTATION

PERFORMANCE OBJECTIVES
Demonstrate proficiency in performing rapid and/or comprehensive auscultation of the anterior and posterior breath sounds.

CONDITION
Auscultate anterior and posterior breath sounds and perform rapid chest auscultation in critical situations on a conscious patient using a live model or respiration simulator. Necessary equipment will be adjacent to the patient or brought to the field setting.

EQUIPMENT
Live model or respiration simulator, stethoscope/dual teaching stethoscope, goggles, mask, gown, gloves.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establishes body substance isolation precautions	• Mandatory personal protective equipment – gloves at all times • Situational - long sleeves, goggles, masks, gown as needed
♦ Direct the patient to breathe deeply in and out through their open mouth when you are ready to listen at specific areas	• When auscultating breath sounds, you need to determine whether they are normal (vesicular), or abnormal (adventitious). • Breathing with an open mouth increases air flow resulting in more accurate sounds. • Having the patient cough if their lungs are congested will clear secretions and result in hearing sounds such as crackles (rales) and rhonchi. • Absent breath sounds means that you cannot hear any flow of air through the bronchial tubes on one (1) side of the chest or another, or both sides. • Clear breath sounds mean that you hear air traveling in and out of one (1) lung or the other, or both lungs, and that there are no adventitious sounds. • Crackles (rales) are the sounds of air passing through fluid in the alveoli. Hi-pitched crackles are called “fine,” and low-pitched sounds are called “coarse.” • Rhonchi are low pitched rattling sounds caused by mucus in the larger airway. Rhonchi clear with coughing. • Wheezing is air moving through a constricted and/or inflamed bronchial tube. Wheezing is typically heard on exhalation but as the patient’s condition worsens, the patient may have inspiratory and expiratory wheezing. • Stridor is the high-pitched sound heard on inspiration as air is attempting to pass through a partially obstructed airway.

RAPID AUSCULTATION PROCEDURE	
Skill Component	**Key Concepts**
♦ Place the diaphragm of stethoscope directly on patient’s skin over the auscultation site	• Hold the head of the stethoscope between the index and middle fingers and press it firmly against the chest. This allows for improved auscultation of breath sounds and reduces external noises. • The diaphragm of the stethoscope may be slipped into place, under the patient’s clothing, without exposing the patient’s chest.

Skill Component	Key Concepts
♦ Listen for the presence and equality of bilateral breath sounds only: • Instruct the patient to take a deep breath - *if responsive* • Listen at the level of the 5th - 6th intercostal space mid-axillary line	• Rapid auscultation should be done in emergent situations and after placement of advanced airways. • Assess 1-2 inhalations and exhalations to confirm the presence and equality of breath sounds. • Determining the type of breath sounds requires further evaluation which is indicated during the secondary assessment.

ANTERIOR CHEST AUSCULTATION PROCEDURE	
Skill Component	**Key Concepts**
♦ Place the diaphragm of stethoscope directly on patient's skin over the auscultation site	• Hold the head of the stethoscope between the index and middle fingers and press it firmly against the chest. This allows for improved auscultation of breath sounds and reduces external noises. • The diaphragm of the stethoscope may be slipped into place, under the patient's clothing, without exposing the patient's chest.
♦ Auscultate three (3) bilateral anterior fields: • Apices - 1" below the clavicle at mid-clavicular line • Mid-lung fields - 3rd - 4th intercostal spaces (ICS) at the mid-clavicular line • Bases - 6th ICS space at the mid-axillary line	• Both sides of the chest must be auscultated to determine if the breath sounds are equal bilaterally. • Apices – The sound is more bronchial (air movement) and quieter • Mid-lung fields – Are usually heard the loudest • Bases – The sounds are more vesicular (alveolar exchange) and quieter
♦ Auscultate bilateral breath sounds for the presence and equality of bilateral breath sounds only: ***Instruct the patient to take a slow deep breath- if responsive*** ***Listen at the level of the 5th - 6th intercostal space mid-axillary line***	• Rapid auscultation should be done in emergent situations and after placement of advanced airways. • Assess 1-2 inhalations and exhalations to confirm the presence and equality of breath sounds. • Determining the type of breath sounds requires further evaluation which is not indicated at this time.

POSTERIOR CHEST AUSCULTATION PROCEDURE	
Skill Component	**Key Concepts**
♦ Place the diaphragm of stethoscope directly on patient's skin over the auscultation site	• Hold the head of the stethoscope between the index and middle fingers and press it firmly against the chest. This allows for improved auscultation of breath sounds and reduces external noises. • The diaphragm of the stethoscope may be slipped into place, under the patient's clothing, without exposing the patient's chest.
♦ Listen to a minimum of three (3) bilateral posterior fields: • Apices - are located at the vertebral border at the level of T-3 (3rd rib) • Mid-lung fields – are located at the inferior angle of the scapula • Bases – are located three (3) finger breadths below the inferior angle of the scapula at the level of the diaphragm (approx. 10th rib)	• In a conscious patient, have the patient roll their shoulders forward to spread scapulae in order to hear breath sounds more accurately. • In an unconscious patient, place the head of the stethoscope between the scapula • Auscultation of the posterior chest is preferred because sounds are of better quality louder in this location.

Skill Component	Key Concepts
♦ Listen for the presence and equality of bilateral breath sounds only: • Instruct the patient to take a deep breath - *if responsive* • Listen at the level of the 5th - 6th intercostal space mid-axillary line	• Rapid auscultation should be done in emergent situations and after placement of advanced airways. • Assess 1-2 full inhalations and exhalations to confirm the presence and equality of breath sounds. • Determining the type of breath sounds requires further evaluation which is not indicated at this time.

RE-ASSESSMENT
(Ongoing Assessment

Skill Component	Key Concepts
♦ Re-auscultate anterior and posterior breath sounds • The patient has shortness of breath • Has received treatment for adventitious sounds (i.e. an inhaler)	• Rapid chest auscultation may be appropriate in situations where only breath sounds confirmation is needed. • Full assessment of all 6 fields anteriorly and/or posteriorly may be needed to assess changes in patient's pulmonary status.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Verbalize/Document: • Initial and ongoing breath sounds: - type of sounds heard - absent sounds • Location of auscultation (anterior or posterior) • Site where abnormal sounds are heard	• If breath sounds are absent or unable to obtain, document the reason the sounds could not be heard/obtained. - If absent - may be due to lobectomy, atelectasis, bronchoconstriction, bronchospasms, or an unknown reason. - If unable to obtain, may be due to environment too noisy or dangerous, patient refuses, etc. • Documenting reassessment information provides a comprehensive picture of patient's response to treatment. • Documentation must be on either the Los Angeles County EMS Report form, ePCR, or departmental Patient Care Record form.

Developed 3/02 Revised 10/2018

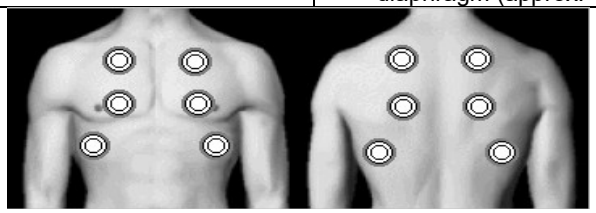
EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

PATIENT ASSESSMENT/**CHEST AUSCULTATION**

Supplemental Information

Auscultation Sites

Anterior	Posterior
Apices – One (1) inch below the clavicle at mid-clavicular line Mid-lung fields - 3rd-4th ICS at mid-clavicular line Bases - 6th intercostal space at mid- axillary line	Apices – Are located at the vertebral border at the level of T-3 (3rd rib) Mid-lung fields – Are located at the inferior angle of the scapula Bases – Are located three (3) finger breadths below the inferior angle of the scapula at the level of the diaphragm (approx. 10th rib)



DEFINITIONS:

- Adventitious - Abnormal sounds. Result from obstruction of either the large or small airways and are most commonly heard on inspiration - crackles, wheezes and rhonchi.
- Atelectasis - A collapse or airless condition of the lungs. This may be caused by obstruction, hypoventilation, mucus plugs or excessive secretions.
- Bronchial -sounds heard over a major bronchus are harsh, high-pitched sounds with an equal inspiratory and expiratory phase.
- Death Rattle - Audible rales that are heard without a stethoscope. This is usually heard as patient is dying.
- Lobectomy - The surgical removal of a lobe of the lung or any organ.
- Tracheal - sounds heard over the trachea; loud and high-pitched with a pause between inspiratory and expiratory phase (expiratory phase slightly longer).
- Vesicular - normal breath sounds heard all over the chest distal to the central airways; soft sound and is primarily an inspiratory sound. May be diminished in older, obese, or very muscular patients. Harsher sounds heard if ventilations are rapid and deep or in children due to their thin, elastic chest walls.

BREATH SOUNDS	OTHER TERMS	DESCRIPTION
Clear	Normal	Clear and quiet breath sounds heard during inspiration and expiration. They are louder during inspiration.
Rales	Crackles Crepitation Wet	Crackling, popping sound produced by air passing over airway secretions/fluid or the sudden opening of collapsed airways. They may be coarse or fine and heard usually on inspiration but can be heard on expiration. They are louder during inspiration.
Rhonchi	Sonorous rales Congested	Low- pitched continuous rumbling, snoring sound produced by narrowing of the larger airways due to thick secretions or muscle spasms. Sonorous wheezing sounds may be heard on inspiration or expiration (usually expiration). This often clears or changes with coughing.
Wheezes	Musical rales	High-pitched continuous sound produced by narrowing of the smaller airways. Whistling sounds may be heard on inspiration or expiration - louder during expiration. ***They are more severe if heard on inspiration.***
Stridor	Crowing	Brassy, crowing sound produced by obstruction in the upper airways. May be caused by epiglottitis, viral croup, or foreign body - most prominent on inspiration. They are heard best over the larynx or trachea.

NOTES:

- Firm pressure must be applied with the head of the stethoscope to eliminate friction sounds of chest hairs rubbing against stethoscope.
- Breath sounds are heard more prominently at the mid-lung field because the lungs are smaller at the apices and bases.
- Compare the sounds heard bilaterally and listen to both the inspiratory and expiratory phase.
- **DO NOT** listen to breath sounds over clothing. This causes significant alteration of sounds heard.
- In pediatric patients breath sounds may be heard throughout torso.
- As patients become more severe, breath sounds may cross over and a combination of sounds may be heard, or one (1) sound may be obliterated by another.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

PATIENT ASSESSMENT / VITAL SIGNS
PULSE

PERFORMANCE OBJECTIVES
Demonstrate competency in performing an accurate pulse assessment.

CONDITION
Perform an accurate pulse assessment for the primary and secondary assessment. The examiner assesses the opposite radial or brachial pulse to determine the accuracy of the assessment. Necessary equipment will be adjacent to the patient or brought to the field setting.

EQUIPMENT
Live model, timing device, stethoscope, goggles, mask, gown, gloves.

PERFORMANCE CRITERIA

- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.
- Reading must be within +/- 4 beats/minute of examiner's determination.

PREPARATION	
Skill Component	**Key Concepts**
♦ Take body substance isolation precautions	• Mandatory (minimal) personal protective equipment – gloves
♦ Locate the most common arterial points: • Peripheral - brachial - radial - ulnar - popliteal - tibial (posterior tibial) - pedal (dorsalis pedis) • Central - carotid - femoral - apical	• Students should be able to locate and palpate all major arterial points. • **Auscultated apical pulses should be obtained on pediatric patients, trauma patients with no detectable pulse, and on patients who are to be pronounced dead in the field.** • Central pulses should **always** be palpated if you are unable to palpate any peripheral pulses. • If patient is critical, peripheral and central pulses should be palpated simultaneously. • Palpate for a pulse using two (2) fingers, (index and middle). Avoid the use of the thumb to palpate a pulse due to the possibility of feeling one's own pulse. • Femoral pulses are palpated in the inguinal fold. • Pedal pulses (10-15%) are often difficult to find. Check other signs of circulation. Mark pulses with an X if/when they are located.

PRIMARY ASSESSMENT	
Skill Component	**Key Concepts**
♦ Assess the pulse: • Rate (normal, fast, slow) • Rhythm (regularity) • Quality (strength) § ***If ALS is on-scene, and the pulse is irregular, suggest placing the patient on a cardiac monitor***	• Rate - Determine if the rate is fast or slow. The actual beats per minute are not counted during the primary assessment. • Rhythm (regularity) – The pulse (heart rhythm) may be either regular or irregular. - regular rhythm – there is a consistent interval between beats - irregular rhythm – a beat may come early, late, or not at all. * ***All irregular rhythms are abnormal rhythms.*** • Quality (strength) - determines the "feel" of the pulse. It is described as: strong (normal), full or bounding (stronger than normal), weak or thready (difficult to feel).

SECONDARY ASSESSMENT	
Skill Component	**Key Concepts**
♦ Assess pulse: • Rate (beats/minute) • Rhythm (regularity) • Quality (strength) § ***If ALS is on-scene, and the pulse is irregular, suggest placing the patient on a cardiac monitor***	• The pulse rate can be determined by counting for 30 seconds and multiplying by 2 if the rhythm is NORMAL. • If the patient has an irregular pulse, it MUST be counted for one (1) full minute. • **DO NOT** rely on a cardiac monitor as an accurate pulse rate indicator.

RE-ASSESSMENT (Ongoing Assessment)	
Skill Component	**Key Concepts**
♦ Re-assess the pulse a minimum of every five (5) minutes for unstable patient, and every 15 minutes for stable patients: ' Re-assess the pulse for: • Rate (beats/minute) • Rhythm (regularity) • Quality (strength)	• Unstable patients are patients who have abnormal vital signs, S/S of poor perfusion, if there is a suspicion that the patient's condition may deteriorate, or when the patient's condition changes.

PATIENT REPORT AND DOCUMENTATION	
Skill Component	**Key Concepts**
§ Verbalize/Document: • Rate (beats/minute) • Rhythm (regularity) • Quality (strength) • ECG reading - *if applicable*	• If the monitor is applied, document the palpated pulse and the heart rate on the monitor. • **DO NOT** rely on a cardiac monitor as an accurate pulse rate indicator. • Documentation must be on either the Los Angeles County EMS Report form, ePCR, or departmental Patient Care Record form.

Developed: 3/02 Revised 10/1/2018

PATIENT ASSESSMENT / VITAL SIGNS
PULSE

Supplemental Information

Note:

- 10-15% of pedal pulses are difficult to find. Check other signs of circulation. Mark pulses with an "X" if located.

Normal Pulse Rate		Pulse Quality/Strength	
Adult	60-100	Strong	normal
Adolescent 11-14 years	60-105	Full/bounding	stronger than normal
School Age 6-10 years	70-110	Weak/thready	difficult to feel
Preschool 3-5 years	80-120		
Toddler 1-3 years	80-130		
Infant 6-12 months	80-140		
Infant 0-5 months	90-140		
Newborn (Neonate) 0-28 days	120-140		

COMMON CAUSES OF ABNORMAL PULSE RATE OR RHYTHM		
Tachycardia	**Bradycardia**	**Irregular Rhythm**
Exercise Hypoxia Fever Infection Hypovolemia Hyperthyroidism Emotional upset Stimulating drugs/medications Myocardial infarction Pain Hyperthermia	Heart disease Organophosphates Calcium channel or beta blocking agents Vagal response Myocardial infarction Pain Intracranial pressure CNS depressing drugs/medications Athletic conditioning Hypothermia	Electrolyte imbalance Conduction defects Cardiac damage (MI) Drug/Chemical ingestion or exposure Medications Hypoxia Abnormal body temperature

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

PATIENT ASSESSMENT / VITAL SIGNS
BLOOD PRESSURE (BP)

PERFORMANCE OBJECTIVES
Demonstrate proficiency in obtaining a blood pressure (+/- 4mmHg) using the auscultation method, palpation method, and by using a noninvasive blood pressure monitor.

CONDITION
Auscultate a systolic and diastolic blood pressure, palpate a systolic blood pressure, and obtain a non-invasive blood pressure on a live model. Necessary equipment will be adjacent to the patient or brought to the field setting.

EQUIPMENT
Live model, large/medium/pediatric sphygmomanometer, non-invasive blood pressure monitor, stethoscope/dual teaching stethoscope, goggles, mask, gown, gloves.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.
- Reading must be within +/- 6 mmHg (systolic and diastolic) of examiner's determination.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions	• Mandatory personal protective equipment - gloves • Situational - goggles, mask, gown
♦ Select and expose an appropriate site: • Upper extremity • Lower extremity	• Letting the patient know what he/she may feel during the measurement allows for a more accurate reading. Constriction of the arm or limb that is held in a tense position results in an inaccurate reading and leads to discomfort, blood clots, and a potential injury to the vein.
♦ Select appropriate size blood pressure cuff	• Each EMS unit should carry all sizes of BP cuffs (large, adult, and pediatric). • The appropriate cuff size must be selected to ensure an accurate measurement. - The cuff width should cover 2/3rd of the upper portion of the limb. - The bladder of the cuff should encircle 2/3rd of the circumference of the limb. - Using a cuff too large gives a false "low" reading. - Using a cuff too small gives a false "high" reading.

UPPER EXTREMITY AUSCULTATED BLOOD PRESSURE PROCEDURE	
Skill Component	**Key Concepts**
♦ Apply the cuff snuggly around arm: • Approximately 1" above antecubital space • Center the bladder over the brachial artery • Ensure bulb and tubing are at bottom of cuff - *if possible*	• The center of the bladder cuff must be placed over brachial artery in order to register sounds clearly. • The bulb and tubing should be at the bottom of the cuff unless a limb contracture or other-problems prevent this.

Skill Component	Key Concepts
♦ Locate the brachial artery and palpate for a pulse	• The purpose for locating the brachial artery is to find the best site for sound reproduction. • The rescuer must use their fingertips to palpate for a pulse. • The thumb should NEVER be used as it contains its own pulse which may be mistaken for the patient's pulse.
♦ Insert the earpieces of the stethoscope into the rescuer's ears	• The earpieces must be facing forward. This allows for better sound conduction.
♦ Place the diaphragm/bell of the stethoscope over the brachial artery	• Prior to placing the diaphragm of the stethoscope over the brachial artery, tap on the diaphragm/bell and listen for the sound through the earpieces. This enables you to determine which side of the head of the stethoscope to place over the artery. • If stethoscope has a dual head, use the bell side of the head of the stethoscope for better sound conduction.
♦ Place/hold arm at the level of the heart	• The arm should be held at the level of the heart for the best sounds to be heard.
♦ Inflate the cuff while listening for pulse sounds ***** Inflate the cuff an additional 20-30mmHg above the level where the pulse sound stops,***	• Over inflation of the cuff causes vasospasms and/or pain and results in a false high reading.
♦ Deflate the cuff 2-4 mmHg/second and note where the first sound is heard *(systolic pressure)*	• Deflating the cuff too slowly causes venous congestion and results in a false high reading. • The first sound heard indicates the initial flow of blood through the artery (ventricular contraction ejecting blood into the arterial system). • If the first sound is not heard, deflate the cuff completely and wait a minimum of 30 seconds before attempting re-inflation to prevent venous congestion.
♦ Continue to deflate the cuff 2-4 mmHg/second and **note** where the first change in tone changes or disappears *(diastolic pressure)* (+/- 4mmHg)	• The sounds may disappear completely at this point or they may change (muffled). This occurs because the pressure in the cuff falls below the pressure in the artery. This is considered the diastolic pressure (ventricles in diastole - resting phase).

LOWER EXTREMITY AUSCULTATED BLOOD PRESSURE PROCEDURE

Skill Component	Key Concepts
♦ Apply the cuff snuggly around the thigh: • Approximately 1" above the crease behind the knee • Center the bladder over the popliteal artery • Ensure bulb and tubing are at bottom of cuff - *if possible* *****Place the patient in the supine position***	• The lower extremity should be used to determine the blood pressure when the upper arm cannot be used. • The patient should be placed in a supine position and the lower extremity should be relaxed for an accurate reading to occur. • The center of the bladder must be placed over the popliteal artery in order to register sounds clearly. • The lower extremity systolic pressure may be 10-40 mmHg higher than in the upper extremities. The diastolic pressure may be the same or lower than the arm.
♦ Locate the popliteal artery and palpate pulse	• The purpose for locating the popliteal artery is to find the proper site to place the diaphragm of the stethoscope. • Use the fingertips to palpate and **NOT** the thumb.
♦ Insert the earpieces of the stethoscope into ears	• The earpieces must be facing forward. This allows for better sound conduction.

Skill Component	Key Concepts
♦ Place the diaphragm/bell of the stethoscope over the popliteal artery	• Prior to placing the diaphragm of the stethoscope over the brachial artery, tap on the diaphragm/bell and listen for the sound through the earpieces. This enables you to determine which side of the head of the stethoscope to place over the artery. • If stethoscope has a dual head, use the bell side of the head for better sound conduction.
♦ Place/hold leg at the level of the heart	• The leg should be held at the level of the heart for the best sounds to be heard.
♦ Inflate the cuff while listening for pulse sounds ***** After the pulse sound disappears, inflate the cuff an additional 20-30mmHg above the level where the pulse sound stopped***	• Over inflation of the cuff causes vasospasms and/or pain and results in a false high reading.
♦ Deflate the cuff 2-4 mmHg/second and note where the first sound is heard *(systolic pressure)* (+/- 4mmHg)	• Deflating the cuff too slowly causes venous congestion and results in a false high reading. • The first sound heard indicates the initial flow of blood through the artery (ventricular contraction ejecting blood into the arterial system). • If the first sound is not heard, deflate the cuff completely and wait a minimum of 30 seconds before attempting re-inflation to prevent venous congestion.
♦ Continue to deflate the cuff 2-4 mmHg/second and note where the last distinct sound is heard *(diastolic pressure)* (+/- 4mmHg).	• The sounds may disappear completely at this point or they may change (muffled). This occurs because the pressure in the cuff falls below the pressure in the artery. This is considered the diastolic pressure (ventricles in diastole - resting phase). This is recorded as the 2nd or last sound (120/80).

PALPATED BLOOD PRESSURE PROCEDURE

Skill Component	Key Concepts
♦ Places the cuff on snuggly around the arm: • Approximately 1" above antecubital space • Center the bladder over the brachial artery • Ensure bulb and tubing are at bottom of cuff - *if possible*	• Obtaining a ***palpated BP is NEVER preferred.*** A palpated BP only provides a systolic pressure and does not provide a diastolic pressure. Therefore, important diagnostic information is not known (i.e. the pulse pressure). • The pulse pressure is the difference between the systolic and diastolic pressure (i.e. 120/80 has a pulse pressure of 40mmHg). Pulse pressure readings of greater than 40mmHg may be indicative of serious underlying medical emergencies. Without a diastolic reading, a widened pulse pressure (> 40 mmHg) would go undetected. • A palpated blood pressure should only be used when environmental noise precludes you from hearing the sounds. An auscultated pressure should always be attempted initially and ASAP during the ongoing assessment. • Palpated pressure readings are lower than auscultated readings. • The arm should be held at level of the heart in order to obtain the best measurement. • The center of the bladder must be placed over brachial artery in order to obtain an accurate measurement.

Skill Component	Key Concepts
♦ Locate and palpate the pulse at the brachial or radial artery	• The brachial artery gives the most accurate systolic reading.
♦ Place/hold arm at the level of the heart	
♦ Inflate the cuff while palpating the radial pulse ** ***After the radial pulse disappears, inflate the cuff an additional 20-30mmHg above the level where the pulse stopped***	• Over inflation of the cuff causes vasospasms and/or pain and results in a false high reading.
♦ Deflate cuff 2-4 mmHg/second and note where the first beat is felt (+/- 4mmHg)	• Deflating the cuff too slowly causes venous congestion and results in a false high reading. • The first beat felt indicates the initial flow of blood through the artery (ventricular contraction ejecting blood into the arterial system).

NON-INVASIVE BLOOD PRESSURE MONITOR (NIBP) PROCEDURE	
Skill Component	**Key Concepts**
♦ Obtains a baseline auscultated blood pressure reading	• A baseline auscultated blood pressure must be obtained and documented prior to the use of a noninvasive blood pressure monitor.
♦ Apply and position the noninvasive cuff on the arm or thigh	• The noninvasive blood pressure monitor is applied in the same manner as the sphygmomanometer.
♦ Place/Hold arm/leg at the level of the heart	
♦ Activate the device by depressing the button	• Letting the patient know what he/she may feel during the measurement allows for a more accurate reading. Constriction of the arm or limb that is held in a tense position results in an inaccurate reading and leads to discomfort, blood clots, and a potential injury to the vein.
♦ Obtain and interpret the reading, +/- 4mmHg of the auscultated blood pressure .	• The systolic and diastolic pressure will be noted in the display portion of the device. • If the initial BP reading obtained does not correlate with the patient's clinical picture, the pressure is high, bilateral pulses are unequal, or if there is a suspicion of an aortic dissection an auscultated blood pressure must be obtained. • If the reading was not obtainable, the device will indicate this in the display portion of the device.

RE-ASSESSMENT (Ongoing Assessment)	
Skill Component	**Key Concepts**
§ Re-assess auscultated or palpated blood pressure as required: • Unstable patients every 5 minutes • Stable patients every 15 minutes	• If a palpated blood pressure was obtained initially, obtain an auscultated blood pressure **ASAP**. • Obtain a BP readings in the both arms if the initial BP reading obtained does not correlate with the patient's clinical picture, the pressure is high, bilateral pulses are unequal, or if there is a suspicion of an aortic dissection.

PATIENT REPORT AND DOCUMENTATION	
Skill Component	**Key Concepts**
§ Verbalize/Document: • Blood pressure reading • Site used • Patient's position	• Documentation must be on either the Los Angeles County EMS Report form or Provider Patient Care Record or ePCR. • Documenting reassessment information provides a comprehensive picture of patient's response to treatment. • If blood pressure is palpated or a lower extremity is used to obtain a blood pressure, document the rationale for using this method or site. • The site used may provide different pressure values which are specific to the upper or lower extremity. • It is important to document the patient's position as to standing, sitting or lying down.

Developed 3/02 Revised 10/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

PATIENT ASSESSMENT / VITAL SIGNS
BLOOD PRESSURE

Supplemental Information

DEFINITIONS:

- Blood pressure - measurement of force applied against the walls of the arteries as the heart pumps blood through the body. Determined by stroke volume (amount of blood ejected into the arterial system with one ventricular contraction), heart rate, and peripheral vascular resistance (BP=combination of SV, HR, and PVR)
- Pulse pressure -is defined as the difference in pressure between the systolic and diastolic pressure. This diagnostic information is important in certain conditions:
  - Widening pulse pressure may indicate increased intracranial pressure
  - Narrowing pulse pressure may indicate cardiogenic, hypovolemic or other forms of shock which have a decreasing systolic pressure

NOTES:

- The extremity should be at the level of the heart and in a relaxed position or readings will be inaccurate:
  - above heart level leads to a false "low" reading
  - below heart level leads to a false "high" reading
- The brachial artery gives the most accurate systolic reading. It can be palpated all the way down to approximately 70mmg/Hg. The radial artery is no longer palpable below 80mmHg.
- If you will be using an NIBP, a baseline auscultated blood pressure must be obtained and documented prior to its use.
- The noninvasive blood pressure monitor is applied in the same manner as the sphygmomanometer.
- The systolic and diastolic pressure will be noted in the display portion of the device.
- If the initial BP reading obtained does not correlate with the patient's clinical picture, the pressure is high, bilateral pulses are unequal, or if there is a suspicion of an aortic dissection an auscultated blood pressure must be obtained.
- If the reading was not obtainable, the device will indicate this in the display portion of the device.
- Hypertension in adults is when the systolic pressure is sustained > 140mmHg **OR** diastolic pressure > 90mmHg. However, patients with chronic hypertension may be in shock when pressures drop below their normal and are considered adequate for non-hypertensive patients.

Normal systolic blood pressure parameters		Systolic blood pressures denoting hypotension when associated with signs and symptoms of shock	
Newborn	50-70	Males	< 90 Systolic
Infant	80-100	Females	< 80 Systolic
Child	80-110	Children	< 70 Systolic
Adult	90-140		

Common Pitfalls	
Situation	**Results**
Cuff is too large	False low reading
Cuff is too small	False high reading
Center of the bladder is not over the brachial artery	Inaccurate reading
Cuff is deflated too slowly	Causes venous congestion = false high reading
Cuff is over inflated	Causes vasospasms/pain = false high reading

Documentation	
Readings	**Readings**
Two sound readings	Systolic/diastolic (120/72)
Palpated reading	Systolic/palpated (90/P).
In some situations the diastolic sound may not disappear completely and is recorded as systolic/zero (72/0).	

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

PATIENT ASSESSMENT
FINGER STICK BLOOD GLUCOSE TESTING

PERFORMANCE OBJECTIVES
Demonstrate proficiency in recognizing the indications, contraindications, and criteria for administration of oral glucose administration and finger stick blood sugar testing for a patient having an altered level of consciousness and a suspected history of diabetes.

CONDITION
Establish that a simulated patient with an altered level of consciousness who meets the criteria for administration of oral glucose and Necessary equipment will be adjacent to the simulated patient. The glucometer has been

EQUIPMENT
Simulated patient, oxygen tank with a flow meter, oxygen mask, blood pressure cuff, stethoscope, glucometer, lancets, tongue blade or bite stick, timing device, clipboard, PCR forms, pen, goggles, masks, gown, gloves, sharps container.

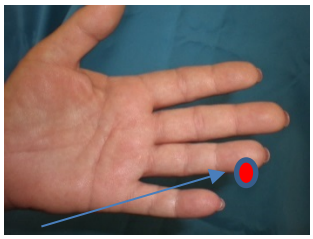
PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions	• Mandatory personal protective equipment - gloves • Situational - goggles, masks, gown
♦ Complete a primary assessment • General impression • Life-threatening condition • Assess mental status/stimulus response (AVPU) • Assess/Manage airway • Assess/Manage breathing	
♦ Complete a secondary assessment • SAMPLE history • Vital Signs • Obtain an oxygen saturation (SpO_2) reading – if available ***Place the patient on oxygen in accordance with Los Angeles County EMS Agency Reference Number 1302**	• Obtaining and documenting a baseline set of vital signs assists with determining if the patient is improving or deteriorating after medication delivery • Document the SpO_2 reading on the provider report or ePCR. • A goal of oxygen administration is to deliver the minimum amount of oxygen to meet the needs of the patient and to maintain an oxygen saturation level of 94-98%. • **SPECIAL CONSIDERATION:** For chronic obstructive pulmonary disease (COPD), the goal is to titrate oxygen to keep the SpO_2 at 88-92%.
♦ Verbalize the indications for finger stick blood sugar testing: ◦ altered level of consciousness with suspected hypoglycemia ◦ unconscious with a suspected history of diabetes	• In order to perform finger stick blood sugar testing, EMTs must be on duty and working for a provider agency that has been approved by the EMS Agency Medical Director to carry a glucometer on the ambulance. • EMTs may assist the patient with the patient's own glucometer. If the EMT is **NOT** knowledgeable in the use of the specific device, and the patient and/or family members are not present to assist the EMT, the device should not be used. • Once a provider agency has been approved to carry glucometers on a basic life support apparatus, EMTs may assist the paramedic by obtaining a blood glucose level.
♦ Ensure the device has been calibrated	• Calibration must be in accordance with the manufacturers recommendations

Skill Component	Key Concepts
♦ Verbalize the signs and symptoms of hypoglycemia • Rapid onset • Cool, pale, and moist skins • Rapid (tachycardia) and weak pulse • Confusion/disorientation • Unconsciousness • Seizures • Weakness • Stroke-like symptoms	• The signs and symptoms of hypoglycemia are due to the release of endogenous epinephrine while the blood sugar is decreasing. • The brain is the only organ that does not require the use of insulin as a glucose transport mechanism into the cell. • When there are low levels of insulin in the blood, the cells will uptake glucose at a slower rate • The brain is extremely sensitive to low levels of sugar in the blood. Therefore, signs and symptoms of hypoglycemia occur rapidly.
♦ Verbalize the signs and symptoms of hyperglycemia • Gradual onset (6-12 hours) • Warm and dry skin • Rapid and deep respirations (Kussmaul) • Fruity breath • Rapid, weak, and thready pulse • Polydipsia – excessive thirst • Polyphagia - hunger • Polyuria – excessive urination • Restlessness - progressing to coma	• When there is a lack of insulin in the system, the cells starve for energy and will begin to break down fat, which leads to the increase of acid within the body systems. The pH of the body decreases. In an attempt to bring the body back to the state of homeostasis, the body attempts to compensate by attempting to breathe off the excess acid. This will be accomplished by rapid and deep respirations known as “Kussmaul” respirations. The breath smells “fruity.” • When the blood sugar reaches 185mg/dL, the kidneys can no longer reabsorb the excess glucose. When the level reaches around 225mg/dL, sugar is spilled into the urine. Additionally, glucose is a large molecule that draws water that is urinated out of the system. This leads to severe dehydration. The patient experiences hunger (polyphagia) because the cells are starving,
♦ Verbalize the normal and abnormal low blood glucose levels: • Normal –70 -120mg/dL • Low - < 60mg/dL • High - > 120mg/dL	• The following are the most common causes of hypoglycemia: ➢ The patient takes his/her insulin but does not eat ➢ The patient takes his/her insulin but exercises beyond their normal level ➢ The patient takes too much insulin • **In Los Angeles County, prehospital providers should treat a blood sugar of < 60mg/dL.** However, EMTs may treat a patient with oral glucose in the field without a blood glucose reading if the patient is suspected to be hypoglycemic based upon his/her presenting signs and symptoms.
♦ Calls for an Advanced Life Support Unit	• If the use of a glucometer is required, an ALS Unit must be contacted and be enroute. However, if the ETA for the responding ALS unit exceeds the ETA to the most appropriate emergency department, the EMT should consider transporting the patient.
♦ Prepare the equipment required for blood glucose determination by following the manufacturer’s directions	• There are numerous devices on the market. Therefore, it is essential to follow the manufacturer’s directions for that specific device.

PROCEDURE

Skill Component	Key Concepts
♦ Turn on the glucometer	
♦ Place the patient’s hand in dependent position for 10-15 seconds	• Pricking the fingers to obtain a blood sugar reading can lead to discomfort. Therefore, using a non-dominant hand is recommended. • Placing the hand in a dependent position allows blood to pool in the fingertips making it easier to obtain a drop of blood.

Skill Component	Key Concepts
♦ Grasp the patient's finger	• The best locations for a finger stick are generally the 3rd and 4th fingers of the non-dominant hand. • If possible, avoid the 1st (thumb), 2nd (index), and 5th (little) fingers. The 1st finger has a pulse, the 2nd finger is sensitive and may be callused, and the 5th finger has insufficient tissue depth to prevent bone injury. • Fingers that are swollen, cold, cyanotic, or scarred should be avoided.
♦ Cleanse the site using aseptic technique: • Use an alcohol wipe to cleanse the fingertip in a circular motion from inner to outer • Allow the fingertip to air-dry	• Allowing alcohol to dry on the fingertip is an essential step to receiving an accurate reading. Excess water or alcohol may result in diluting the blood sample thereby altering your reading.
♦ Puncture the lateral aspect of the fingertip with a single use lancet device  http://poct.duhs.duke.edu/wysiwyg/downloads/fingerstick Training.ppt.	• Never use the center of the finger pad or the tip of the finger. • Puncture the fingertip in the fleshy part of the finger slightly to the side of the center and across the groves. This enables the blood to form as a drop on the fingertip. If the puncture is parallel to the lines of the fingertip, the blood will not form as a drop but will run down the finger making blood collection difficult. • A single use lancet device is spring loaded that activates when a button is pressed. Once activated, the lancet is projected forward and then retracts back into the device. • Use caution to avoid placing the lancet device into contact with the rescuers finger as opposed to the patient's finger to avoid an inadvertent needle stick. • The fingers of the hand are the only approved sites for obtaining a blood glucose reading.
♦ Squeeze the fingertip gently to form a drop of blood	• Free-flowing blood is necessary to obtain a reliable result. Increased pressure beyond that necessary to hold the finger can result in inaccurate results. • Milking the end the finger pad **must not be performed** as this may result in hemolysis or increased tissue fluid in the blood that will alter the result of the reading due to dilution.
♦ Wipe away the first drop of blood using a 2 X 2 dressing or cotton ball	• The first drop of blood tends to contain excess fluid from the tissues. Wiping away the first drop of blood assist with obtaining an accurate reading.
♦ Re-squeeze the fingertip gently to form a drop of blood	• Apply light pressure to the site, only if necessary, to obtain another drop of blood that is large enough to fill the test strip. • Avoid milking the fingertip as this may result in hemolysis or causing an increased amount of fluid in the blood
♦ Place the blood into the glucometer using the device-specific receptacle at the appropriate time.	• Follow the manufacturer's directions.
♦ Interpret the results of the blood sugar testing from the device	• The normal range for blood sugar is 70-120mg/dL. • Administration of oral glucose is recommended for a blood glucose level of 60mg/dL or less. • If error codes are noted, they must be addressed and reported
♦ Apply a sterile adhesive bandage on the finger stick site	• Application of direct pressure with gauze or cotton ball is always the first step in bleeding control. • Patients with a bleeding disorder or taking blood thinners including aspirin, coumadin, and lovenox may bleed for a longer period.
♦ Interpret the results of the blood sugar testing from the device	• The normal range for blood sugar is 70-120mg/dL. • Administration of oral glucose is recommended for a blood glucose level of 60mg/dL or less if the patient is alert and is able to follow commands.

Skill Component	Key Concepts
♦ Dispose the lancet and test strip into a sharps container	• The lancet and test strip should be placed directly into an approved sharps container. If the container is over-stuffed with needles, replace it with a new container as over-stuffed containers may cause a needle to penetrate the plastic and cause an inadvertent needle stick. Replace the sharps disposal container when it is ¾ full.
♦ Turn the machine off	

RE-ASSESSMENT (Ongoing Assessment)	
Skill Component	**Key Concepts**
§ Re-assesses the patient at least every **5 minutes**: • Primary assessment • Relevant portion of the secondary assessment • Vital signs: Blood Pressure, Pulse, Respirations • SpO_2 reading • Response to oral glucose – *if administered* ***§ Manage patient's condition as indicated.***	• A patient with an altered mental status must be re-assessed every 5 minutes. • The purpose of the ongoing assessment is to recognize signs and symptoms of improvement or deterioration of the patient's condition. • Evaluating and comparing results from a prior assessment assists in trending the patient's condition. This helps to facilitate rapid interventions - if required.

PATIENT REPORT AND DOCUMENTATION	
Skill Component	**Key Concepts**
§ Verbalize/Document • Blood glucose reading • Assessment findings before and after administration of oral glucose • Drug: Name, dose, route, time, • Patient's response to medication • Respiratory/Cardiovascular status • Mental status • Vital signs: Blood pressure, pulse, and respirations	• Documentation of the results of blood sugar testing must be on the Provider's form, or an ePCR. • Document administration only in the comment section on the Los Angeles County EMS Report, • Documenting re-assessment information provides a comprehensive picture of patient's response to treatment.

Developed: 10/2017 Revised 11/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

FINGER STICK BLOOD GLUCOSE TESTING

Supplemental Information

DEFINITION:

Diabetes mellitus (DM): Diabetes is a metabolic disorder in which the body is in-capable of metabolizing simple carbohydrates (glucose). Mellitus is a Greek word meaning "sweet." It is a reference to the presence of glucose spilling out of the kidneys into the urine.

ASSESSMENT: ALTERED LEVEL OF CONSCIOUSNESS / SEIZURE / WEAKNESS / DIZZINESS / SYNCOPE

- Causative event and if acute or chronic
- Time of onset
- Duration of event
- Orientation level (name, place, and time)
- Associated symptoms (neuro deficits, pupil response)
- Position found in
- Length of time unconscious
- Incontinence
- Dysrhythmia
- Possible causes: (not all inclusive)
  - **A** alcohol, anoxia, allergic reaction, arrhythmia (dysrhythmia)
  - **E** epilepsy, electrolyte imbalance
  - **I** insulin (hyper-hypoglycemia)
  - **O** overdose
  - **U** uremia, under-dose
  - **T** trauma
  - **I** infection
  - **P** psychiatric, post-ictal, poisoning (ingestion, inhalation), palpitation (dysrhythmias)
  - **S** stroke

NOTES:

- In life-threatening situations, an ALS Unit must be enroute or BLS should consider transport if ALS arrival is longer than transport time.
- Glucose is the basic sugar in the body. Glucose and oxygen are the primary fuels required by the body for cellular metabolism.
- Adults with diabetes have a higher incidence of kidney failure and heart disease. It also effects walls of vessels and leads to a condition known as microangiopathy. Diabetes also leads to nerve damage, which results in the loss of function and feeling to the areas innervated by that nerve. Couples with vessel damage, these patients' wounds may occur that are not noted at the time and left uncared for they lead to gangrene of the affected extremity. Approximately 60% of amputations are attributed to Diabetes.
- Insulin is a hormone that is produced by specialized cells called the islets of Langerhans in the pancreas. These cells become damaged from viruses or over-consumption of sugar over years and the result is ceased or decreased production of insulin. The only cells in the body that are not dependent upon insulin to facilitate glucose from moving in to the cells are the brain cells.
- There are two (2) forms of diabetes mellitus: type 1 and type 2. Both types result in very serious medical conditions that can be life-threatening.
- Type 1 diabetes has once been referred to as "juvenile onset" diabetes because it typically occurs during childhood. Type 2 diabetes has been called "adult onset" because it typically manifests itself during adulthood. Type 1 diabetes always requires insulin while type 2 can be managed by oral medication or insulin, or a combination of both.
- The three (3) hallmark signs and symptoms of Diabetes include:
  - **Polyphagia** – increased hunger due to the inability to transport glucose into the cell
  - **Polydipsia** – increased thirst due to large fluid losses caused by diuresis
  - **Polyuria** – increased urine output due to water being attracted to the excess glucose and diuresis

FINGER STICK BLOOD GLUCOSE TESTING

Supplemental Information

- Examples of oral medications used to treat Type 2 diabetes: **NOTE:** Medication names a subject to change.
  - Metformin (Glucophage)
  - Sitagliptin (Januvia)
  - Rosiglitazone (Avandia)
  - Pioglitazone (ACTOS)
  - Chlorpropamide (Diabinese)
  - Glyburide (Micronase)
- Examples of insulin used to treat Type 1 diabetes:
  - Humulin
  - Novolog
  - Lantus
  - Novolin
  - Exubera
  - Apidra
  - Toujeo
  - Tresiba
  - Levemir

Section 3:
Cardiology

Learn the Facts

You should have a comprehensive understanding of:

- Anatomy & Physiology
- Conditions listed in the index
- Glossary words
- Medical terms listed in each chapter
- Pathophysiology

Understand the Concepts

You should have an extensive understanding of the following:

1. Acute stroke
2. American Heart Association (AHA) Basic Life Support current guidelines
3. Anatomy of the heart and cardiovascular system
4. Angina
5. Complications of electrical injuries and treatment
6. Dyspnea/Nocturnal dyspnea
7. Hypertension (HTN)/Hypotension
8. Pathophysiology of Acute Coronary Syndrome (ACS)
9. Pathophysiology of left-sided heart failure
10. Pulseless Electrical Activity (PEA)
11. Return of spontaneous circulation (ROSC)
12. Shockable rhythms and indications for an AED
13. Signs and symptoms of a cardiac dysrhythmia

Perform the Skills

Finally, you should be able to:

1. Administer prescribed cardiac medication
2. Differentiate between left and right sided heart failure
3. Differentiate between types of strokes
4. Evaluate chest pain without cardiac origin
5. Identify a stroke
6. Identify cardiogenic shock
7. Identify chest pain (not cardiac in origin)
8. Treat a hypotensive patient
9. Treat for return of spontaneous circulation (ROSC)

Cardiology Conditions

Angina Pectoris

Inadequate oxygen supply to the heart muscle, or myocardium. Often caused by partial blockage of the coronary arteries, which causes ischemia.

- Subjective
  - Chest pain (substernal) radiating to the neck/jaw/arms/back/shoulders, mild to moderate discomfort described as heavy/pressure/tightness, duration > 30min, pain usually relieved with rest
  - Diaphoresis is not a common symptom and should increase your suspicion for true pain/ischemia

- Objective
  - Vital Signs: Ensure that pt. is hemodynamically stable

- Differential Diagnosis
  - Myocardial Infarction
  - Congestive Heart Failure
  - Pleurisy
  - Pneumonia
  - Costochondritis

Myocardial Infarction

A portion of the heart muscle dies because of the lack of an adequate supply of oxygenated blood.

- Subjective
  - Chest pain (substernal) radiating to the neck/jaw/arms/back/shoulders, intense discomfort described as heavy/pressure/tightness, duration greater than 30min, pain not relieved with rest
  - Associated symptoms – Diaphoresis, shortness of breath, nausea, or vomiting
  - Treatments Initiated Prior to Arrival
    - Nitroglycerin and/or Aspirin self-administered?
    - Antacids self-administered?
    - Other medications self-administered?

- Risk Factors
  - Obesity
  - Diabetes
  - Smoking
  - Hypertension
  - Hypercholesterolemia

- Objective
  - Vital Signs: Ensure that pt. is hemodynamically stable

- Differential Diagnosis
  - Unstable Angina
  - Congestive Heart Failure
  - Pleurisy
  - Pneumonia
  - Costochondritis

○ Aortic Dissection

A tear in the aortic intima, where blood passes into the aortic media, thereby separating the intima from the surrounding media and/or adventitia, and creating a false lumen.

- Subjective
  - Acute onset of tearing chest pain radiating anterior/posterior
  - Other symptoms include hoarseness, syncope, nausea/vomiting, abdominal pain, and paralysis

- Risk Factors
  - Aortic Coarctation (narrowing of the aorta where the pulmonary vein attaches to the aorta)
  - Atherosclerosis (hardening of an artery due to atheromatous plaque)
  - Connective Tissue Disorders (Marfan Syndrome, Scurvy)
  - Hypertension (most common)
  - Diabetes
  - Pregnancy
  - Smoking

- Objective
  - Vital Signs: HTN and/or tachycardia
  - Physical Exam: Pulsating abdominal mass

- Differential Diagnosis
  - Myocardial Infarction
  - Acute Pericarditis
  - Pulmonary Embolus
  - Pneumothorax
  - Peptic Ulcer Disease
  - Esophageal Spasm

○ Congestive Heart Failure

A condition where there is a build-up of fluid (congestion) in the body from the pump failure of the heart.

- Subjective
  - Dyspnea, chest pain, orthopnea, palpitations, peripheral edema, weakness/fatigue,
  - Gradual vs. Sudden Onset
    - Gradual – dietary indiscretion, noncompliance with medication, worsening of heart functions or renal insufficiency
    - Sudden – new onset arrhythmias, acute myocardial infarction, or acute onset of valvular heart disease

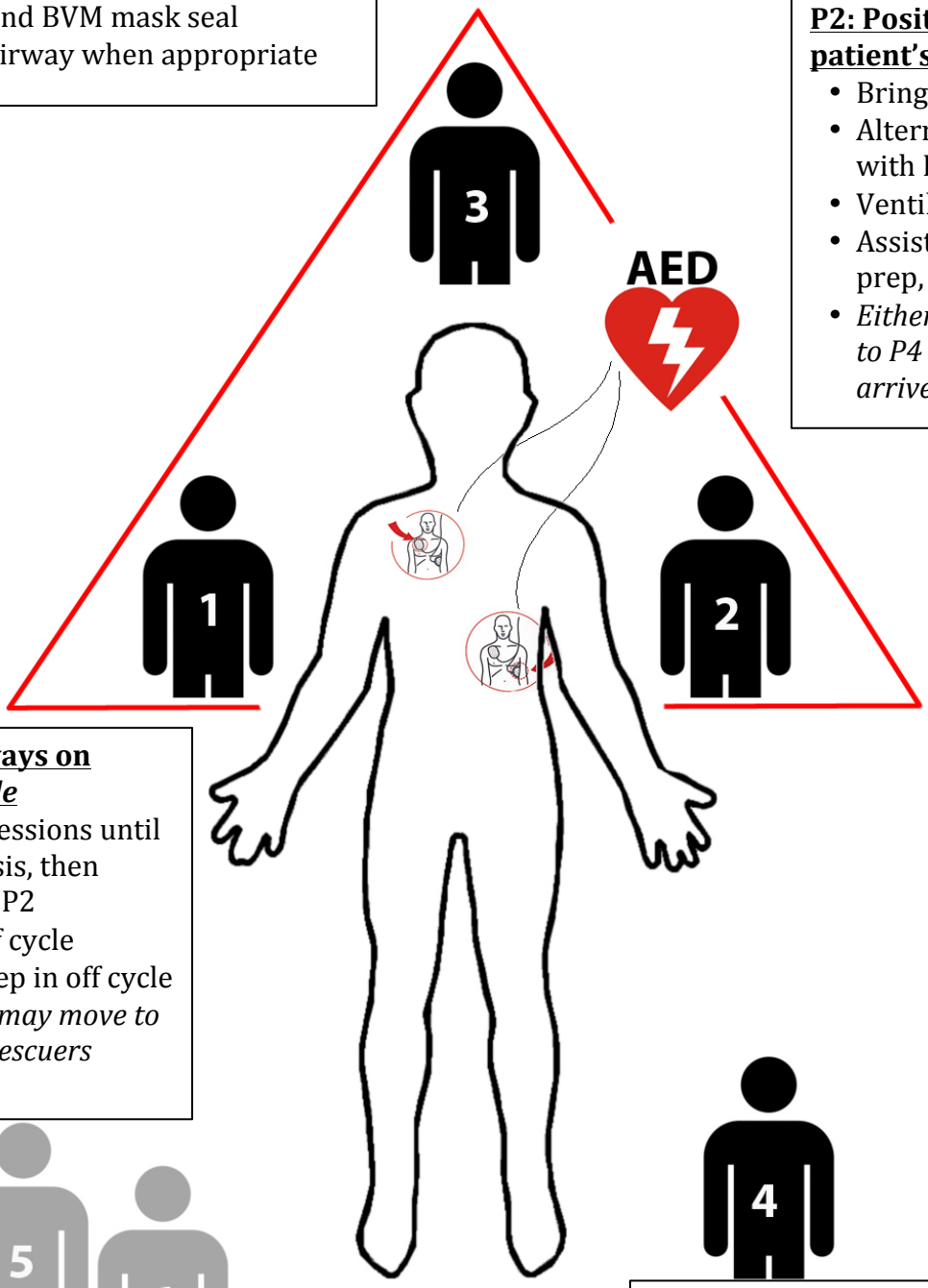
- Objective
  - Physical Exam:
    - HEENT – Jugular venous distention
    - Lungs – Rales, accessory muscle use
    - Abdomen – Ascites supports long-standing CHF
    - Extremities – Diminished pulses and/or peripheral edema
    - Neurological – Diminished with Hypoperfusion

- Differential Diagnosis
  - Pneumonia
  - Myocardial Infarction
  - Pulmonary Embolism
  - Thyrotoxicosis
  - Renal Failure

BLS CPR Pit Crew

P3: Position 3 always at patient's *Head*
- Opens and clears airway; inserts adjunct
- Assembles/applies BVM, suction, O_2
- Provides 2-hand BVM mask seal
- Inserts King airway when appropriate

P2: Position 2 always on patient's *Left side*
- Brings and operates AED
- Alternates compressions with P1
- Ventilates in off cycle
- Assists with King airway prep, if needed
- *Either P1 or P2 may move to P4 when more rescuers arrive*



P1: Position 1 always on patient's *Right side*
- Initiates compressions until AED first analysis, then alternates with P2
- Ventilates in off cycle
- King Airway prep in off cycle
- *Either P1 or P2 may move to P4 when more rescuers arrive*

Advanced providers *can come in and deliver meds [P5] and operate a cardiac monitor [P6] by/from the legs, outside the CPR triangle*

P4: Position 4 *outside the CPR triangle, by the legs until ALS comes*
- Code Commander/Team Leader
- Makes all treatment decisions
- Ensures high-quality CPR
- Question bystanders/handle scene control
- Interface/hand-off with ALS

Summary of High-Quality CPR Components for BLS Providers

Component	Adults and Adolescents	Children (Age 1 Year to Puberty)	Infants (Age Less Than 1 Year, Excluding Newborns)
Scene safety	Make sure the environment is safe for rescuers and victim		
Recognition of cardiac arrest	Check for responsiveness No breathing or only gasping (ie, no normal breathing) No definite pulse felt within 10 seconds (Breathing and pulse check can be performed simultaneously in less than 10 seconds)		
Activation of emergency response system	If you are alone with no mobile phone, leave the victim to activate the emergency response system and get the AED before beginning CPR Otherwise, send someone and begin CPR immediately; use the AED as soon as it is available	***Witnessed collapse*** Follow steps for adults and adolescents on the left ***Unwitnessed collapse*** Give 2 minutes of CPR Leave the victim to activate the emergency response system and get the AED Return to the child or infant and resume CPR; use the AED as soon as it is available	
Compression-ventilation ratio *without advanced airway*	***1 or 2 rescuers*** 30:2	***1 rescuer*** 30:2 ***2 or more rescuers*** 15:2	
Compression-ventilation ratio *with advanced airway*	Continuous compressions at a rate of 100-120/min Give 1 breath every 6 seconds (10 breaths/min)		
Compression rate	100-120/min		
Compression depth	At least 2 inches (5 cm)*	At least one third AP diameter of chest About 2 inches (5 cm)	At least one third AP diameter of chest About 1½ inches (4 cm)
Hand placement	2 hands on the lower half of the breastbone (sternum)	2 hands or 1 hand (optional for very small child) on the lower half of the breastbone (sternum)	***1 rescuer*** 2 fingers in the center of the chest, just below the nipple line ***2 or more rescuers*** 2 thumb–encircling hands in the center of the chest, just below the nipple line
Chest recoil	Allow full recoil of chest after each compression; do not lean on the chest after each compression		
Minimizing interruptions	Limit interruptions in chest compressions to less than 10 seconds		

*Compression depth should be no more than 2.4 inches (6 cm).

Abbreviations: AED, automated external defibrillator; AP, anteroposterior; CPR, cardiopulmonary resuscitation.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

AIRWAY EMERGENCY: ADULT/CHILD AIRWAY OBSTRUCTION

PERFORMANCE OBJECTIVES
Demonstrate competency in recognizing and managing a foreign body airway obstruction in an adult or child who is choking

CONDITION
Recognize and manage an airway obstruction in an adult or child who is found choking. Necessary equipment will be adjacent to the manikin or brought to the field setting.

EQUIPMENT
Adult & child CPR manikin, adult & child bag- mask-ventilation (BMV) or barrier device, O_2 connecting tubing, oxygen source with flow regulator, suction, goggles, various masks, gown, gloves, timing device, airway bag.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required, if indicated.
- Items identified by (§) should be practiced.
- Ventilations and compressions must be performed at the minimum rate required.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions (BSI)	• Mandatory (minimal) personal protective equipment – gloves
♦ Assess for scene safety/scene size-up	
♦ Evaluate the need for additional BSI precautions	• Situational - goggles, mask, gown
♦ Approach and introduce yourself to the patient and/or caregivers – *if circumstance, time and resources allow*	• Establishing rapport with the patient confidence provides reassurance to the patient. • When introducing yourself to a child, use age-appropriate techniques. • Caregivers should hold a young child during the assessment if the patient is coughing.

RESPONSIVE ADULT PROCEDURE	
Skill Component	**Key Concepts**
♦ Establish that the patient is choking: ** ***Call for additional resources –*** *if needed*	• Mild Obstruction: - adequate air exchange - coughing - gagging - wheezing (May wheeze between coughs) • Severe Obstruction: - poor or no air exchange - increased work of breathing - weak, ineffective cough or no cough - stridor (high-pitched upper airway noise while inhaling - inability to speak - clutching the neck (universal sign of choking) - cyanosis - decreasing level of consciousness

Skill Component	Key Concepts
♦ Attempt to remove foreign body obstruction: • **Mild obstruction** - Do not interfere with the patient's attempt to relieve the obstruction (coughing) • **Severe obstruction** - Perform abdominal thrusts (Heimlich maneuver) - Stand or kneel in an athletic position behind the patient and place thumb side of fist against the patient's abdomen, in the midline, slightly above the navel and well below the breastbone. (between the patient's xiphoid and umbilicus) - Grasp his/her fist with other hand and press your fist into the patient's abdomen with a quick, forceful upward thrust. give quick forceful inward and upward thrusts *as many times as needed*	• **DO NOT** interfere if the patient has an effective cough. Stay with the patient and monitor the patient's condition. • If the patient is sitting or standing, place the patient in a position that allows for balance and supports the patient when performing abdominal thrusts. • Fever, congestion, hoarseness, or drooling are signs of infection. If present in the adult, immediate transport to the Most Accessible Receiving (MAR) must occur. In the child, immediate transport to an Emergency Department Approved for Pediatrics (EDAP) must occur as foreign body airway maneuvers will not resolve this type of condition. • An athletic position is defined as standing behind the patient with the rescuers knees slightly flexed and their body slightly rotated off to one side of the patient.
♦ Repeat abdominal thrusts until the obstruction is relieved or the patient becomes unresponsive.	• Abdominal thrusts must continue until the object is expelled, the patient starts to breathe, or becomes unresponsive. Give each thrust with the intention of relieving the obstruction. • Each thrust must be delivered as a separate and distinct movement with sufficient force to relieve the obstruction. • The obstruction may have been relieved if the patient becomes unresponsive due to muscle relaxation.

UNRESPONSIVE ADULT
PROCEDURE

Skill Component	Key Concepts
♦ Lower the patient gently to the ground or a firm surface in a supine position. ** ***Call for additional resources***	• If the patient is on a soft surface, compressions will be less effective. • If the patient is found in a prone position with suspected trauma, the patient should be turned using the log-roll method to avoid flexion or twisting of the neck and back.
♦ Initiate compressions without checking for a pulse: - Begin with compressions - Rate of 100-120/minute - Compress to a depth of at least two (2) inches in the adult - Compresses to a depth of about two (2) inches in the child	• **DO NOT PERFORM A PULSE CHECK** prior to initiating chest compressions • Chest compressions may create as much force as abdominal thrusts so the patient may expel the object
♦ Open the airway by performing a head tilt/chin lift maneuver after 30 compressions ** ***Check the mouth for an object in the back of the throat. If the object is seen and can be easily removed, remove it.***	• Each time you open the airway to give breaths, open the patient's mouth and look for the object. If you see the object, remove it. • **DO NOT** perform a blind finger sweeps, as this may force the object further down the trachea. • The tongue is the most common cause of airway obstruction due to decreased muscle tone. • The tongue and epiglottis may obstruct the entrance of the trachea due to inspiratory efforts creating negative pressure in the airway.

Skill Component	Key Concepts
♦ Attempt to ventilate the patient by administering two (2) breaths (one (1) second each)	• Making a ventilation attempt may facilitate the foreign body into a position where air may be able to be passed around the foreign body and into the lungs.
♦ Resume compressions until: • the object is removed • ALS assumes care	• Complete 5 cycles or approximately 2 minutes of CPR at 30:2. • Open the airway before delivering breaths. If the object is seen, remove it, if possible.
♦ Re-assess patient if obstruction is relieved and check for: - **R**esponsiveness to stimuli - **P**ulse - **B**reathing ** ***Provide rescue breathing – See adult or child BMV or Mouth-to-Mask skills*** ****Deliver oxygen – if indicated, per Los Angeles County EMS Agency Reference No. 1302***	• Responsive patients should be placed in a position of comfort. • A breathing non-responsive patient should be placed in a position to reduce the chance of the airway occlusion by the tongue, and aspiration of mucus or vomit.

RE-ASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
§ Re-assess the patient at least every five (5) minutes or sooner once the obstruction is relieved • Respirations and circulation continually • Primary assessment • Relevant portion of the secondary assessment • Vital signs ****Manage patient condition as indicated.***	• Patients requiring resuscitation from chocking are critical and must be re-evaluated at least every five (5) minutes or sooner. • Evaluating and comparing results from the previous assessment assists with recognizing if the patient is improving, responding to treatment, or if their condition is deteriorating. • The need for additional treatment is based upon information gained during reassessment.
§ Explain the care being delivered and transport destination to the patient/caregiver	• Communication is important when dealing with the patient, family, or caregiver. This is a very critical and frightening time for all involved and providing information helps in decreasing the stress they are experiencing.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Give patient report to equal or higher level of care personnel	• The patient report should consist of all pertinent information regarding the assessment findings, treatment rendered, and the patient's response to care provided.

Skill Component	Key Concepts
§ Verbalize/Document: • Cause of obstruction - identify foreign body • Observed or reported signs of obstruction: - skin signs - absent or inadequate respirations • Response to obstruction maneuver Reassessment of airway • Additional treatment provided	• Re-assessment of the airway includes: - chest rise and fall - skin color - airway patency • Documentation must be on either the Los Angeles County EMS Report, ePCR, or departmental Patient Care Record.

Developed: 10/01 Revised: 10/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

AIRWAY EMERGENCY: ADULT AIRWAY OBSTRUCTION

Supplemental Information

INDICATIONS: Patients who show signs of mild or severe airway obstruction

CONTRAINDICATIONS: None when the above condition applies.

COMPONENTS OF AN AIRWAY BAG:	
BMV devices – adult, child, infant	**Portable suction**
OP/NP airways – all sizes	**Suction equipment– various sizes**
Nasal cannula	**Portable oxygen cylinder and oxygen regulator**
Simple face mask – adult, child, and infants	**Pulse Oximeter**
Non-rebreather – adult, child, and infants	**Water soluble lubricant**

NOTES:

- Perform chest thrusts for responsive patients who are pregnant or obese.
- Responsive patients with a pulse should be placed in a position of comfort, unless spinal motion restriction is indicated.
- Unresponsive patients with a pulse should be placed in the recovery position to reduce the chance of the airway being occluded by the tongue and the aspiration of mucus or vomitus.
- Remove dentures **only** if they cannot be kept in place. Fitted dentures provide a good seal while using a BMV.
- If the obstruction is relieved, there may be a potential that not all foreign body fragments are completely removed.
- Patients who received abdominal thrusts should be encouraged to seek medical evaluation to ensure there are no complications, injuries, or retained foreign body fragments.
- **DO NOT** hyperventilate. Hyperventilation reduces the success of survival due to cerebral vasoconstriction resulting in decreased cerebral perfusion. In addition, hyperventilation increases intrathoracic pressure and decreases venous return to the heart resulting in diminished cardiac output. ***Rescuers have a tendency to ventilate too rapidly*.**
- Critical patients are patients who have abnormal vital signs, signs/symptoms of poor perfusion, or if there is a suspicion that the patient's condition may deteriorate.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

CARDIAC EMERGENCY: CARDIOPULMONARY RESUSCITATION ADULT – 1 and 2 RESCUER CPR

PERFORMANCE OBJECTIVE
Assess signs of cardiopulmonary arrest in an adult and perform one (1) and two (2) person cardiopulmonary resuscitation in compliance the 2015 Emergency Cardiac Care (ECC) standards.

CONDITION
Assess and perform cardiopulmonary resuscitation for an adult patient who appears to be unresponsive. Necessary equipment will be adjacent to the manikin or brought to the field setting.

EQUIPMENT
Adult CPR manikin, bag-mask (BMV) device, O_2 connecting tubing, oxygen source with flow regulator, AED, oropharyngeal and nasopharyngeal airways appropriate for manikin, silicone spray, water-soluble lubricant, goggles, various masks, gown, gloves, suction, timing device, PCR form, airway bag.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required, if indicated.
- Items identified by (§) should be practiced.
- Ventilations and compressions must be performed at the minimum rate required.

PREPARATION	
Skill Component	**Key Concepts**
♦ Take body substance isolation precautions	• Mandatory personal protective equipment – gloves should be worn at all times • Situational - goggles, masks, gown as needed
♦ Assess scene safety/scene size-up ** ***Consider spinal motion restriction (SMR) - <u>if indicated</u>***	• If trauma is suspected, treat as a trauma patient. This is determined by the environment and information obtained from bystanders.
♦ Evaluate the need for additional BSI precautions	• Situational - goggles, masks, gown as needed
§ Approaches the patient and explains the care being delivered and transport destination to the patient/caregiver	• Communication is important when dealing with the patient, family, or caregiver. This is a very critical and frightening time for all involved and providing information helps in decreasing the stress they are experiencing.

PROCEDURE	
Skill Component	**Key Concepts**
♦ Checks responsiveness ***Tap the shoulder and shouts "Are you OK?"***	• You do not want to start CPR on a sleeping patient. Always tap the shoulder and shout "Are you OK?" • Healthcare Providers must call for help upon finding a patient unresponsive while continuing to assess the breathing and pulse. The goal is to get the AED to the patient ASAP. • **DO NOT** start CPR in patients who meet the criteria for Reference No. 814 or 815.

Skill Component	Key Concepts
♦ Palpate for a carotid pulse while simultaneously assessing for breathing: *****Check for a carotid pulse for up to 10 seconds*** *****Check for breathing for up to 10 seconds***	• Palpate for a pulse at the same time as assessing breathing minimizes the delay in starting CPR. • The carotid pulse is located in the groove of the neck between the trachea and the neck muscles. • To check for breathing, scan the patient's chest for rise and fall for no longer than 10 seconds • To check for breathing, scan the patient's chest for rise and fall for no more than 10 seconds. • Palpate carotid pulse on same side as the rescuer. **DO NOT** reach across the neck. An alternative to palpating a carotid pulse is to palpate the femoral pulse. • If you are unsure if the patient has a pulse, begin chest compressions. Unnecessary CPR is less harmful than if CPR is not performed when indicated.
♦ Call for additional resources – <u>if needed</u> ** ***Request an AED - <u>if not already on scene</u>*** ** ***Move the patient onto a hard surface***	• <u>If two (2) rescuers are present</u>, the 2nd rescuer should request ALS and get the AED • <u>If a team is present</u>: One (1) rescuer calls for ALS rescuer and defibrillator One (1) rescuer starts chest compressions Two (2) rescuers provides ventilation with a BMV • If the patient is on a soft surface, place a board under the patient or move the patient to the floor.
♦ Move the patient onto a hard surface – *if indicated* *****Place a CPR board under the patient or move onto the floor***	• A hard surface allows for the compression of the heart between the chest wall and the vertebrae for increased blood flow.
♦ Expose the chest	• Exposing the chest aids with proper hand placement on the chest.
♦ Initiate chest compressions*:* ** ***Start compressions (C-A-B sequence)*** • Perform compressions of the lower ½ of breastbone (DO NOT compress on or over the xiphoid process). • OR • Heel of one hand on the sternum and other hand on top of the 1st hand • Depth: at least two (2) inches • Rate: 30 compressions at a rate of at least 100-120/minute (hard and fast) • Ratio cycle: 30 compressions to two (2) ventilations ** ***DO NOT compress on or near the xiphoid process.*** ** ***Allow for complete chest recoil between compressions*** ** ***Attach the AED as soon as available***	• **<u>DO NOT DELAY THE INITIATION OF CHEST COMPRESSIONS.</u>** **<u>Compression landmark</u>:** • The heel of one (1) hand is placed on the center of the breastbone. • While providers may use one (1) or two (2) hands, the two handed method is preferred in Los Angeles County. **One (<u>1) handed method:</u>** • The heel of one hand is placed on the sternum while stabilizing the wrist with the opposite hand **Two (<u>2) handed method:</u>** • Place the heel of one hand on top of the 1st hand • Fingers may be extended or interlaced, but must be kept off the chest • Shoulders directly over hands • Arms straight and elbows locked - delivers force of compression straight down in order to be more effective • Allow chest to return to normal position (chest recoil) after down stroke to allow blood to flow into the chest and heart (50% of time for down stroke and 50% for chest relaxation) • Compressions need to be at least two (2) inches to be effective. • Delays/interruptions in chest compressions must be minimized to 10 seconds or less.

	Continued…. • Compression rate: A rate of at least 100-120/minute (speed of compressions) delivers fewer than 100-120/minute due to interruption of providing ventilations. The actual number is determined by the accuracy and consistency of the compression cycle (30 compressions should be delivered within 15-18 seconds or less). • The viability of organs is directly affected by perfusion and oxygenation. The longer a patient is without CPR, the greater the damage to vital organs. • The AED should be used as soon as it becomes available. Continue CPR while charging.
MAY SWITCH TO AED SKILL HERE	
Skill Component	**Key Concepts**
♦ Resume chest compressions immediately if a shock has been delivered	• Pulse checks **ARE NOT** performed after a shock has been delivered. • By resuming chest compressions immediately after shocking the patient, the chances for ROSC are increased.
♦ Open/Maintain a patent airway: • Medical - head-tilt/chin-lift • Trauma – jaw thrust ** ***Clear/suction airway - if indicated*** ** ***Consider nasopharyngeal or oropharyngeal airway - if indicated***	• When a head, neck, or spine injury is suspected, use the jaw thrust maneuver. • If the jaw thrust maneuver does not open the airway to allow for adequate ventilation, use the head tilt-chin lift technique.
♦ Manage ventilations: • Give 2 breaths with BMV device or pocket mask - (1 second/breath) ** ***Ensure adequate chest rise – may reposition head one (1) time if chest rise is not adequate*** ** ***Avoid excessive ventilation*** ** ***Perform continuous chest compressions If advanced airway is in place,*** ***- 10 breaths per minute or breath one (1) every six (6) seconds,***	• While performing ventilations, use *only* enough force to allow for good chest rise. Over-inflation causes gastric distention which will affect tidal volume by elevating the diaphragm. • Do not make more than one (1) attempt to ensure adequate chest rise and fall as this causes unnecessary delays in resuming chest compressions. • Using a BMV by a single rescuer is difficult and may not be as effective as a pocket mask due to inadequate seal and this may reduce the number of compressions delivered per minute. • Dentures should ***only*** be removed if they cannot be kept in place to prevent an airway obstruction. Fitted dentures maintain form for a good seal. • If an advanced airway is in place, perform continuous chest compressions. Ventilations are administered at a rate of 10 breaths/minute or (One (1) breath every six (6) seconds).
♦ Establish a cycle of compressions to ventilation ratio of 30:2	• A compression cycle consists of 30 compressions to 2 ventilations • Five (5) compression cycles should take approximately 2 minutes at a ratio of 30:2.

Skill Component	Key Concepts
♦ Switch roles about every two (2) minutes – *if additional rescuers are available* ** Resumes CPR beginning with compressions at a rate of 100-120/minute and ending with two (2) ventilations ** ***Establishes a compression to ventilation ratio of 30:2 for 1 rescuer*** ** ***Delivers two (2) breaths (Each breath over one (1) second)*** ** ***Completes about two (2) minutes of CPR***	• Switching roles about every five (5) minutes prevents rescuer fatigue. • Switching roles should take less than 5 seconds. • If using an AED, make switch when AED is analyzing to minimize interruption in compressions to 10 seconds or less. • The universal rate for compressions in all cardiac arrest patients is 100 to 120/minute with the exception of neonates. • A compression cycle consists of 30 compressions and 2 ventilations. • 5 compression cycles should take approximately 2 minutes.
♦ Continue CPR until ALS arrives or patient shows signs of return of spontaneous circulation (ROSC) • If circulation is present and breathing is normal – place in recovery position and monitor for a pulse every five (5) minutes • If circulation is present, but breathing is absent or inadequate - continue with rescue breathing 10-12 ventilations/minute (1 breath every 5-6 seconds) • If no circulation present - continue CPR ratio 30-2	• Signs of return of circulation are movement and/or response to verbal or tactile stimuli • Signs of poor perfusion are pallor, mottling, cyanosis and altered level of consciousness. • Consider transport to the nearest receiving hospital after 20 minutes of EMS resuscitation if no other resources are enroute, -- Reference No. 502. • Paramedics are required to take the patient with ROSC to an approved STEMI receiving hospital – Reference No. 513.

IF RETURN OF SPONTANEOUS CIRCULATION:

Skill Component	Key Concepts
♦ Re-assess the patient about every five (5) minutes after return of spontaneous circulation (ROSC): • Check for: • **R**esponsiveness • **P**ulse • **B**reathing	• The main considerations of post-resuscitation are: - Check for a pulse about every five (5) minutes - Perform a primary and pertinent secondary assessment at least every five (5) minutes. • If a pulse is present and the patient is not breathing adequately, start ventilations utilizing a BMV or ventilate with advanced airway (placed by ALS provider) including end tidal CO_2 monitoring.
♦ Perform rescue breathing - *if indicated* • Ventilation rate: • 10-12 breaths/minute (one (1) breath every 5-6 seconds) • - Advanced airway – 10 breaths/minute (one (1) breath every six (6) seconds)	• If respirations are absent or inadequate, the rescuer must open the airway and ventilate the patient to prevent hypoxic injury to the brain and other organs. • Hypoxia may result in bradycardia which leads to cardiac arrest.
§ Explain the care being delivered and the transport destination to the patient/caregivers	• Communication is important when dealing with the patient, family, or caregiver. This is a very critical and frightening time for all involved and providing information helps in decreasing the stress they are experiencing.

RE-ASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
♦ Re-assess the patient at least every five (5) minutes once the patient has return of spontaneous respirations and circulation (ROSC): • **R**esponsiveness • **P**ulse • **B**reathing ***** Manage patient's condition as indicated.***	• This is an unstable patient and must be re-evaluated about every five (5) minutes if any treatment is initiated, medication administered, or if the patient's condition changes. • Unstable patients are patients who have abnormal vital signs, signs/symptoms of poor perfusion, or if there is a suspicion that the patient's condition may deteriorate. • The main considerations of post-resuscitation are: - Check for a pulse about every five (5)minutes - Perform a primary and pertinent secondary assessment at least every five (5) minutes.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Give patient report to equal or higher level of care personnel	• The patient report should consist of all pertinent information regarding the assessment findings, treatment rendered, and the patient's response to care provided.
• This is an unstable patient and must be re-evaluated about every five (5) minutes if any treatment is initiated, medication administered, or if the patient's condition changes. • Unstable patients are patients who have abnormal vital signs, signs/symptoms of poor perfusion, or if there is a suspicion that the patient's condition may deteriorate. • The main considerations of post-resuscitation are: - Check for a pulse about every five (5)minutes - Perform a primary and pertinent secondary assessment at least every five (5) minutes.	• This is an unstable patient and must be re-evaluated about every five (5) minutes if any treatment is initiated, medication administered, or if the patient's condition changes. • Unstable patients are patients who have abnormal vital signs, signs/symptoms of poor perfusion, or if there is a suspicion that the patient's condition may deteriorate. • The main considerations of post-resuscitation are: - Check for a pulse about every five (5)minutes - Perform a primary and pertinent secondary assessment at least every five (5) minutes.

Developed: 11/01 Revised 10/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

CARDIAC EMERGENCY / CARDIOPULMONARY RESUSCITATION
ADULT - 1 OR 2 RESCUER CPR

Supplemental Information

DEFINITIONS:

- *Recovery position* – Patient is turned onto their left side with their bottom arm underneath them, bent at the elbow, and hand near the head. The hand of the upper arm is near the cheek, and the upper leg is bent to stabilize the patient. No single position is perfect for all patients, but the recovery position is preferred to maintain a patent airway and spinal stability, minimize risk of aspiration, and limit pressure on bony prominences and nerves. It also allows for visualization of respirations and skin color, and provides access for needed interventions.

COMPLICATIONS:

- Gastric distention
- Rib fractures
- Sternal fractures
- Separation of ribs from sternum
- Laceration of liver or spleen
- Pneumothorax
- Hemothorax
- Lung and heart contusion
- Fat emboli

PRECAUTIONS:

- EMS personnel often deliver excessive ventilations during CPR which may result in:
  - increased intrathoracic pressure and impedance of venous return resulting in decreased cardiac output, cerebral blood flow, and coronary perfusion
  - air trapping and barotraumas in children with small-airway obstruction
  - increases risk of regurgitation and aspiration in children without an advanced airway

NOTES:

- An alternative to palpating the carotid pulse is palpating the femoral pulse.
- Chest compressions must be performed on a hard surface. If on a soft surface, place a board under the patient or move the patient to the floor.
- CPR cycle begins with compressions and ends with ventilations.
- The tongue is the most common cause of airway obstruction due to decreased muscle tone.
- The tongue and epiglottis may obstruct the entrance of the trachea due to inspiratory efforts creating negative pressure in the airway.
- Use the jaw thrust maneuver when a head, neck, or spine injury is suspected. If the jaw thrust maneuver does not open the airway to allow for adequate ventilation, use the head tilt-chin lift technique.
- If the patient is in a prone position with suspected trauma, the patient should be turned using log-roll method to avoid flexion or twisting of the neck or back.
- If the patient is breathing adequately with no signs of trauma, place in recovery position as soon as the primary assessment is complete and have suction immediately available. This prevents airway obstruction by the tongue and from mucus or vomitus.
- **DO NOT** hyperventilate patient; this increases intrathoracic pressure, decreases venous return to the heart, and diminishes cardiac output and survival.
- Insert an oropharyngeal or nasopharyngeal airway when using a BMV device for ventilation.

POLICIES:

- Reference No. 502 - Patient Destination
- Reference No. 510 - Pediatric Patient Destination
- Reference No. 513 – ST Elevation Myocardial Infarction Patient Destination
- Reference No. 814 - Determination/Pronouncement of Death in the Field
- Reference No. 815 - Honoring Prehospital Do-Not-Resuscitate (DNR) Orders
- Reference No. 815.1 - State of California EMS Prehospital Do-Not-Resuscitate (DNR) Form
- Reference No. 815.2 - Physician Orders for Life Sustaining Treatment (POLST) Form

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

CARDIAC EMERGENCY: CARDIOPULMONARY RESUSCITATION CHILD – 1 and 2 RESCUER CPR

PERFORMANCE OBJECTIVES
Assess signs of cardiopulmonary arrest in a child and demonstrate competency in performing cardiopulmonary resuscitation and managing a full arrest.

CONDITION
Assess and perform cardiopulmonary resuscitation for a child who appears to be unresponsive. Necessary equipment will be adjacent to the manikin or brought to the field setting.

EQUIPMENT
Child CPR manikin, bag- mask- valve device, O_2 connecting tubing, oxygen source with flow regulator, AED, oropharyngeal and nasopharyngeal airway appropriate for manikin, silicone spray, water-soluble lubricant, towels for positioning, goggles, masks, gown, gloves, suction, timing device.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required, if indicated, by the scenario.
- Items identified by (§) should be practiced.
- Ventilations and compressions must be at least at the minimum rate required.

PREPARATION	
Skill Component	**Key Concepts**
♦ Take body substance isolation precautions	• Mandatory personal protective equipment – gloves at all times
♦ Assess scene safety/scene size-up ** ***Consider spinal motion restriction (SMR) - <u>if indicated</u>***	• If trauma is suspected, treat as trauma (determined by environment and information obtained from bystanders). • Depending on the size of the child and if SMR is required, an additional rescuer is needed to maintain in-line axial stabilization.
♦ Evaluate additional BSI needs	• Situational - long sleeves, goggles, masks, gown as needed
♦ Approach the child and introduce yourself to the caregivers	

PROCEDURE	
Skill Component	**Key Concepts**
♦ Check responsiveness: ** Tap the child's shoulder and shout "Are you OK?"	• You do not want to start CPR on a sleeping child. Always tap the shoulder and shout "Are you OK?" • Healthcare Providers must call for help upon finding a patient unresponsive while continuing to assess the breathing and pulse. The goal is to get the AED there as soon as possible. • CPR should not be initiated in children who meet the criteria for: Reference No. 814 or 815.
♦ Check for a carotid or femoral pulse while simultaneously assessing breathing: ** ***Assess for a carotid or femoral pulse for no less than 5 seconds but for no longer than 10 seconds*** ** ***Assess breathing for up to 10 seconds***	• The femoral pulse can be located by using two (2) fingers in the inner thigh midway between the hip bone and the pubic bone and just below the crease where the leg meets the torso (groin). • Care must be taken to avoid placing excessive pressure on the carotid or femoral pulse. Pressing too hard may obliterate the pulse in a small child. • Palpating for the presence of a carotid pulse should be performed on same side as the rescuer. DO NOT reach across the neck. An alternative to palpating a carotid pulse is to palpate the femoral pulse.

	Continued… • It can be difficult to determine the presence of a pulse in a small child. Therefore, if you do not feel a pulse within 10 seconds, begin chest compressions. • When assessing for breathing, scan the patient's chest for rise and fall for no longer than 10 seconds. • Unnecessary CPR is less harmful than if CPR is not performed when indicated. • An alternative to palpating the carotid/femoral pulse is by utilizing a stethoscope to auscultate an apical heart rate. (each lub-dub = 1 beat)
Skill Component	**Key Concepts**
♦ Call for additional resources – <u>if needed</u> ** ***Request an AED - <u>if not already on scene</u>***	• <u>If two rescuers</u> are present, the 2nd rescuer should contact ALS and get the AED • <u>If a team</u> is present: 1 rescuer calls for ALS and defibrillator 1 rescuer starts chest compressions 2 rescuers provides ventilation with a BMV
♦ Place child on hard surface ** ***Place a CPR board under the child or move the child onto the floor***	• Chest compressions must be performed on a hard surface. If the patient is on a soft surface, place a CPR board under the child or move the child to the floor. • A hard surface allows for the compression of the heart between the chest wall and the vertebrae for increased blood flow.
♦ Expose the chest	• Exposing the chest aids with proper hand placement on the chest.
♦ Initiate chest compressions: ** Perform compressions over the lower ½ half of the breastbone ** Use 1 or 2 hands: - 1 hand - heel of hand on lower ½ of breastbone - 2 hands – heel of one hand on breastbone with the other hand on top of the 1st hand ** Depth: at least ⅓ of anterior-posterior chest size or about 2 inches or 5cm. ** Rate: at least 100-120/minute (30:2) for 1 rescuer and (15:2) for 2 rescuers. ** ***Start compression cycle - (C-A-B sequence)*** - if no pulse or signs of circulation - if pulse < 60 beats/minute with poor perfusion ** ***Allow for complete chest recoil between compressions*** ** ***Utilize the AED as soon available*** ** ***DO NOT compress on or near the xiphoid process*** ** ***Avoid leaning on the chest*** ** ***Minimize delays and interruptions of compression to less than 10 seconds.***	• **<u>DO NOT DELAY THE INITIATION OF CHEST COMPRESSIONS</u>** • If a child has a pulse rate of less than 60/minute with poor perfusion, CPR must be initiated. Bradycardia in children causes the cardiac output to be insufficient for adequate perfusion and cardiac arrest may be imminent. • Chest compressions should be initiated if you are unsure that if the child has a pulse. Unnecessary CPR is less harmful than if CPR is not performed when indicated. • It is important to allow for full recoil of the chest at the end of each compression and minimize interruptions and delays of chest compressions to 10 seconds or less. • The viability of organs is directly affected by perfusion and oxygenation. The longer a child is without CPR, the greater the damage to vital organs. • For most children, the compression technique will be the same as for an adult: heel of one hand on sternum with the other hand on top of the 1st hand. <u>1 handed method:</u> • Heel of one hand on the breastbone <u>2 handed method:</u> - place the heel of one hand on top of the 1st hand - fingers may be extended or interlaced, but must be kept off chest - shoulders directly over hands - arms straight and elbows locked - delivers force of compression straight down in order to be more effective - allow chest to return to normal position - use the AED as soon as it becomes available. Some AED models are designed for both pediatric and adult use. • CPR must be continued while charging to minimize delays and interruptions in compressions.

Skill Component	Key Concepts
♦ Apply AED pads (must not touch or overlap): • Children/Infants - Anterior-Posterior 1st pad anterior over breastbone 2nd pad posterior between the shoulder blades - Anterior- Anterior Right pad - Wrap over a small child's shoulder Left pad - Left anterior to cover the midclavicular and mid-axillary lines	• **DO NOT INTERRUPT CHEST COMPRESSIONS WHILE APPLYING THE AED PADS ON THE PATIENT.** • Research has shown that if rescuers minimize the interval between the last compression and shock delivery, the shock is much more likely to be effective thereby increasing the chances for the return of spontaneous circulation (ROSC). • Some manufacturers recommend that pads are placed on specific sites/sides – follow the manufacturer's guidelines. • AED pads cannot **TOUCH** one another and should be place about 1" apart. - When pads touch, arcing may occur and result in skin burns. - When pads overlap, the AED is unable to read the rhythm and will result in **no shock** advised.
MAY SWITCH TO AED SKILL HERE	
Skill Component	**Key Concepts**
♦ Resume chest compressions immediately after a shock has been delivered	• Pulse checks ARE NOT performed after a shock has been delivered. • By immediately resuming chest compressions after shocking the patient, the chances for ROSC are increased.
♦ Open/Maintain a patent airway: • Medical • head-tilt/chin-lift • Trauma - jaw-thrust - neutral position (external ear canal should be level with the top of the shoulder ** ***Clear/suction airway - if indicated*** ** ***Consider nasopharyngeal or oropharyngeal airway - if indicated***	• The use of shoulder padding maintains proper airway and spinal alignment. • Use jaw thrust maneuver when head, neck or spine injury is suspected. • If the jaw thrust maneuver does not open the airway to allow for adequate ventilation, use the head tilt-chin lift technique. • It may be necessary to move a child's head through a range of positions to provide an optimal airway. (Only if no trauma is suspected) However, an attempt should be made to minimize movement of the spine and the head and neck. • The use of shoulder padding maintains proper airway and spinal alignment. • The tongue and epiglottis may obstruct the entrance of the trachea due to inspiratory efforts creating negative pressure in the airway. • The child's airway is more compliant and may collapse during respiratory effort. The airway is easily obstructed by mucus, blood, pus, edema, external compression and hyperextension
♦ Manage ventilations: • Give 2 breaths with BMV device or pocket mask - (Each breath over 1 second) • Insert an oral airway or nasopharyngeal airway - *if indicated* ** ***Ensure adequate chest rise*** ** ***Avoid excessive ventilation***	• While performing ventilations, use *only* enough force to allow for good chest rise. Over-inflation causes gastric distention which will affect tidal volume by elevating the diaphragm. • Do not make more than one (1) attempt to ensure adequate chest rise and fall as this causes a delay in resuming chest compressions. • Using a BMV by a single rescuer is difficult and may not be as effective as a pocket mask due to inadequate seal and this may reduce the number of compressions delivered per minute. • EMS personnel often deliver excessive ventilations during CPR which may result in: - increased intrathoracic pressure and impedance of venous return resulting in decreased cardiac output, cerebral blood flow, and coronary perfusion - air trapping and barotraumas in children with small-airway obstruction - increases risk of regurgitation and aspiration in children without an advanced airway

Skill Component	Key Concepts
♦ Switch roles after about 2 minutes (5 cycles of 30:2 or 10 cycles of 15:2) – *if additional rescuers are available* ***** Resumes CPR beginning with compressions and ending with ventilation at a rate of 100-120/minute*** ***** Establishes a compression to ventilation ratio of 30:2 for one rescuer and 15:2 for two rescuers.*** ***** Delivers 2 breaths (Each breath over 1 second)*** ***** Completes about 2 minutes of CPR***	• Switching roles about every two (2) minutes (5 cycles) prevents rescuer fatigue. • Switching roles should take less than 5 seconds. • If using an AED, make the switch when the AED is analyzing the rhythm to minimize interruptions and delays in compressions to 10 seconds or less. • The universal rate for compressions in all cardiac arrest patients is 100 to 120/minute with the exception of the neonate. • A compression cycle consists of 30 compressions and 2 ventilations. • 5 compression cycles should take approximately 2 minutes.
♦ Continue CPR until ALS arrives or patient shows signs of return of spontaneous circulation (ROSC) • If circulation is present and breathing is normal – place in recovery position and monitor • If circulation present, but breathing is absent or inadequate - continue with rescue breathing 12-20 ventilations/minute (1 breath every 3-5 seconds) • If no circulation present - continue CPR ratio of 15:2 ***** Start compressions - if heart rate is less than 60/minute with poor perfusion***	• Signs of return of circulation include movement and/or response to verbal or tactile stimuli. • If there has been no ROSC after 20 minutes of EMS resuscitation and there are no other resources are enroute, consider transport to the nearest receiving hospital -- Reference No. 510.

IF RETURN OF SPONTANEOUS CIRCULATION

Skill Component	Key Concepts
♦ Reassess patient every 2 minutes after ROSC: • Check for: - responsiveness - pulse - breathing ***** Obtain a set of baseline vital signs*** ***** Place in position to protect airway - if patient has adequate respirations***	• The main considerations post-resuscitation are: - Perform pulse check about every 2 minutes. - Perform a primary and pertinent secondary assessment every 5 minutes. • The use of positive pressure ventilation is indicated if a pulse is present but the child is not breathing adequately. • Signs of poor perfusion are cool extremities, pallor, mottling, cyanosis, delayed capillary refill and continued decline of level of consciousness. • Placing the patient in left lateral position decreases the risk of aspiration.
♦ Perform rescue breathing - *if indicated* • Ventilation rate: - BMV – 12-20 breaths/minute (1 breath every 3-5 seconds)	• If respirations are absent or inadequate the rescuer must open the airway and ventilate the patient to prevent cardiac arrest and hypoxic injury to the brain and other organs. • Hypoxia may result in bradycardia and cardiac arrest. • Children under 12 years of age or less than 40Kg shall be managed with a BMV device, NP or OP.
§ Explain the care being delivered and the transport destination to caregivers	• Communication is important when dealing with the patient, family or caregiver. This is a very critical and frightening time for all involved and providing information helps in decreasing the stress they are experiencing.

REASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
♦ Repeat an ongoing assessment about **2 minutes once the child has return of spontaneous respirations and circulation:** • Primary assessment • Relevant portion of the secondary assessment • Vital signs	• If a pulse is present but the patient is not breathing adequately, start ventilations with a BMV device at a rate of 12-20/minute (1 breath every 3-5 seconds) • The main considerations of post-resuscitation are: - Check for a pulse about every 2 minutes - Perform a primary and pertinent secondary assessment at least every 2 minutes.
♦ Evaluate response to treatment:	• The child must be re-evaluated at least every 5 minutes if any treatment was initiated or medication administered.
♦ Evaluate results of on-going assessment and compare to baseline condition and vital signs *****Manage child's condition as indicated.***	• Evaluating and comparing results assists with determining if the patient is improving, responding to treatment, or if their condition is deteriorating. • The need for additional treatment is based upon the information gained during the reassessment.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Give patient report to equal or higher level of care personnel	• When giving a report to a higher level of care, it should consist of all pertinent information regarding the assessment finding, treatment rendered and patient response to care provided.
§ Verbalize/Document: • Documentation elements on EMS Report form should include: - if the arrest was witnessed - if CPR was initiated and by whom - the time CPR was initiated- if applicable - If the AED indicated that a shock was advised or no shock was indicated - the time from the arrest until the onset of CPR - response to treatment/defib - organ or tissue donor	• EMS Personnel are defined as EMTs and paramedics. Law enforcement and EMS personnel off duty who may have started CPR are considered citizens for documentation purposes. • The time of arrest cannot be determined in an unwitnessed arrest. However, documenting when the child was last seen may be helpful. • When assessing for pulses with CPR in progress, have an additional rescuer palpate for a pulse. If there is no pulse with compressions this may be due to inadequate compressions or hypovolemia. • Response to CPR – child regains pulse and/or respirations or remains pulseless and/or apneic. • Documenting reassessment information provides a comprehensive picture of patient's response to treatment. • Last assessment information, before patient care is transferred to ALS or hospital staff should be documented on the EMS form. • Documentation must be on either the Los Angeles County EMS Report or departmental Patient Care Record form or ePCR. • Documentation elements on EMS Report form should include: - if the arrest was witnessed - if CPR was initiated and by whom - the time CPR was initiated- if applicable - If the AED indicated that a shock was advised or no shock was indicated - the time from the arrest until the onset of CPR - response to treatment/defib - organ or tissue donor

Developed: 4/03 Revised: 8/17

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

CARDIAC EMERGENCY / CARDIOPULMONARY RESUSCITATION
CHILD – 1 and 2 RESCUER CPR
Supplemental Information

DEFINITIONS:

- *Recovery position* –Child is turned onto their side with the arm underneath bent at the elbow and hand near the head. The hand of the upper arm is near the cheek, and the upper leg is bent to stabilize the child. *Due to the varied ages and sizes in pediatric patients, there is no universal recovery position for children.* The recovery position is preferred to maintain a patent airway and spinal stability, minimize risk of aspiration, and limit pressure on bony prominences and nerves. It also allows for visualization of respirations and skin color, and provides access for needed interventions.

  The recovery position is not recommended for small children unless the head is adequately supported since the airway may become obstructed.

COMPLICATIONS:

- Gastric distention
- Rib fractures
- Sternal fractures
- Separation of ribs from sternum
- Laceration of liver or spleen
- Pneumothorax
- Hemothorax
- Lung and heart contusion
- Fat emboli

PRECAUTIONS:

- EMS personnel often deliver excessive ventilations during CPR which may result in:
  - increased intrathoracic pressure and impedance of venous return resulting in decreased cardiac output, cerebral blood flow, and coronary perfusion
  - air trapping and barotraumas in children with small-airway obstruction
  - increases risk of regurgitation and aspiration in children without an advanced airway

NOTES:

- Neutral position was once called “the sniffing position.”
- The viability of organs is directly affected by perfusion and oxygenation and the longer a child is without CPR, the greater the damage to vital organs.
- Child CPR technique is indicated for children 1 year-of-age to puberty – signs of puberty are the development of breasts in females and hair under the armpits in males.
- Do not start resuscitation if the child meets the criteria in Ref. No. 814 or 815.
- The tongue is the most common cause of airway obstruction due to decreased muscle tone.
- The tongue and epiglottis may obstruct the entrance of the trachea due to inspiratory efforts creating negative pressure in the airway:
- Move the child no more than necessary to maintain an open airway. An additional rescuer is needed to maintain in-line axial stabilization if spinal immobilization is required.
- If the child is breathing adequately with no signs of trauma, place in recovery position as soon as the primary assessment is completed and have suction immediately available. This prevents airway obstruction by the tongue, mucus or vomitus.
- Insert an oropharyngeal or nasopharyngeal airway when providing positive pressure ventilations.
- Initially there is enough residual oxygen is in the blood to allow for performing compressions early, but once CPR has been started, the oxygen content is depleted in the first few minutes.
- Some signs of inadequate breathing are: respiratory distress, fast/slow respirations, bradycardia, stridor, cyanosis, poor perfusion, and altered LOC.
- Depending on the size of the child, an alternative to palpating the carotid pulse is palpating the femoral pulse.
- Place appropriate padding under the shoulders to maintain proper airway and spinal alignment.
- Chest compressions must be performed on a hard surface, if on a soft surface place a board under the child or move the child to a table or floor, etc.
- CPR cycle begins with compressions and ends with ventilations.
- Insert an oropharyngeal or nasopharyngeal airway when providing positive pressure ventilatior

POLICIES:

- Reference No. 502 - Patient Destination
- Reference No. 510 - Pediatric Patient Destination
- Reference No. 814 - Determination/Pronouncement of Death in the Field
- Reference No. 815 - Honoring Prehospital Do-Not-Resuscitate (DNR) Orders
- Reference No. 815.1 - State of California EMS Prehospital Do-Not-Resuscitate (DNR) Form
- Reference No. 815.2 - Physician Orders for Life Sustaining Treatment (POLST) Form

American Heart Association 2015

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

AIRWAY EMERGENCY: INFANT AIRWAY OBSTRUCTION

PERFORMANCE OBJECTIVES
Demonstrate competency in recognizing and managing an airway obstruction in an infant who is choking.

CONDITION
Recognize and manage an airway obstruction in an infant who is found choking. Necessary equipment will be adjacent to the manikin or brought to the field setting.

EQUIPMENT
Infant manikin, infant bag-mask-ventilation device, O_2 connecting tubing, oxygen source with flow regulator, suction pediatric resuscitation tape, goggles, various masks, gown, gloves, timing device, airway bag.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions required, if indicated.
- Items identified by the symbol (§) should be practiced.
- Ventilations and compressions must be performed at the minimum rate required.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions	• Mandatory (minimal) personal protective equipment – gloves
♦ Assess scene safety/scene size-up	
♦ Evaluate need for additional BSI precautions	• Situational - goggles, mask, gown
♦ Approach the infant and introduce yourself to the infant, family or caregiver – *<u>if circumstance, time and resources allow</u>*	• The caregiver should hold the infant during the assessment if the infant is in no distress and responsive.

RESPONSIVE INFANT PROCEDURE	
Skill Component	**Key Concepts**
♦ Establish that the infant is choking: *****Call for additional resources – <u>if needed</u>*** *****<u>Mild obstruction</u> – Do not interfere with infant's attempt to relieve the obstruction (coughing)***	• **DO NOT** interfere if the infant has an effective cough. <u>Mild Obstruction:</u> - adequate air exchange - coughing - gagging - wheezing (May wheeze in between coughs). <u>Severe Obstruction:</u> - poor or no air exchange - increased work of breathing - weak, ineffective cough or no cough - stridor (high-pitched upper airway noise while inhaling) – Unable to make noise (cry) - cyanosis - decreasing level of consciousness

Skill Component	Key Concepts
♦ Attempt to remove foreign body obstruction – if severe obstruction Kneel or sit with the infant in your lap ***Position the patient by placing the infant prone on the rescuer's forearm*** ***Keep head lower than the body*** ***Support the jaw and face*** ***Perform five (5) back slaps, using the heel of the hand, between the shoulder blades*** ***Use enough force to remove the obstruction***	• Only attempt to remove an obstruction caused by a foreign body. • Fever, congestion, hoarseness, or drooling are signs of infection. If present, immediate transport to an Emergency Department Approved for Pediatrics (EDAP) must occur as foreign body airway maneuvers will not resolve this type of condition. • **DO NOT PERFORM** blind finger sweeps. This may force object further down the distal airway structures. • Use the heel of the hand to deliver slaps to the back between the shoulder blades. • You must deliver each slap with enough force to attempt to dislodge the object.
♦ Sandwiches the infant by placing the opposite arm on top of the infant. ***Rotate the infant onto the opposite arm*** ***Maintain support of the head and neck at all times*** ***Rotate the infant by:*** - ***placing the free hand on the occiput and back, cradling the infant between both hands and arms*** - ***turning the body as one (1) unit*** - ***maintain control of head and neck at all times*** - ***keep the head slightly lower than the body throughout the procedure***	• Placing the infant on your forearm, with their head lower than the chest while supporting their head, allows gravity to assist with moving the foreign body up into the mouth. Hold the jaw and face with fingers extended. **DO NOT** cover the mouth or compress the soft tissue of the neck. • Use caution to avoid compressing the soft tissues of the infant's neck.
♦ Perform up to five (5) chest thrusts ***Support the infant's head with your hand.*** • Places the infant's head slightly lower than the chest while resting on the forearm • Find lower 1/2 of sternum (1 finger width below nipple line) • Use two (2) finger pads • Compress at a depth of at least 1/3rd of chest diameter (about 1 ½ inches • Rate one (1) thrust per second	• Use caution to avoid compressing the soft tissues of the infant's neck. • The technique for chest thrusts is the same as for chest compressions when performing CPR. • Each thrust must be delivered as a separate and distinct movement with sufficient force to relieve the obstruction.
♦ Call for ALS - if obstruction is not relieved after two (2) minutes or infant becomes unresponsive	• The most common cause of cardiac arrest in infants is an inadequate airway. Attempt removal of obstruction for two (2) minutes before leaving the infant to call for other resources.
♦ Repeat a series of up to five (5) back slaps followed by five (5) chest thrusts until the obstruction is relieved or the infant becomes unresponsive	• The obstruction may have been relieved when the patient becomes unresponsive due to muscle relaxation.

UNRESPONSIVE INFANT PROCEDURE

Skill Component	Key Concepts
♦ Place the infant gently on a firm flat surface in a supine position.	• A firm surface allows compression of the chest and heart to create blood flow. Too soft of a surface will push the infant into the soft surface.

Skill Component	Key Concepts
♦ Initiate compressions: • Delivers at a rate of 100-120/min. • Compress at a least one-third the depth of the chest about 1 ½ inches	• **DO NOT CHECK FOR A PULSE** • Place the infant on a firm surface if possible. A firm surface allows compression of the chest and heart to create blood flow. • Five (5) cycles of CPR takes approximately two (2) minutes
♦ Open the airway by performing a head tilt/chin lift maneuver ** ***Check the mouth for an object in the back of the throat. If the object is seen and can be easily removed, remove it***	• The tongue is the most common cause of airway obstruction due to decreased muscle tone. • The tongue and epiglottis may obstruct the entrance of the trachea due to inspiratory efforts creating negative pressure in the airway. • It is important to maintain a neutral position in pediatric patients to prevent hyper-flexion of the neck which may inhibit ventilations or occlude the airway (head is relatively large for size of the body).
♦ Attempt to ventilate the infant: • Administer two (2) breaths, one (1) second each	• Making a ventilation attempt may facilitate the foreign body into a position where air may be able to be passed around the foreign body and into the lungs.
♦ Resume compressions until: • the object is removed • ALS assumes care	• Complete 5 cycles or approximately two (2) minutes of CPR at 30:2. • Open the airway before delivering breaths. If the object is seen, remove it if possible
♦ Re-assess patient if obstruction is relieved and check for: - **R**esponsiveness to stimuli - **P**ulse - **B**reathing ** ***Provide rescue breathing, one (1) breath every 3-5 seconds – if indicated*** ** ***Administer oxygen per Los Angeles County Reference No. 1304***	• Responsive infants should be held by the parents or caregivers. • A breathing non-responsive patient should be placed in a position to reduce the chance of the airway occlusion by the tongue, and aspiration of mucus or vomit.

RE-ASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
§ Reassess the infant **at least every** five (5) minutes or sooner once the obstruction is relieved • Respirations and circulation continuously • Initial assessment • Relevant portion of the secondary assessment • Vital signs ** ***Manage the infant's condition as indicated.***	• Choking infants that required resuscitation are priority patients and must be re-evaluated at least every five (5) minutes or sooner. • Evaluating and comparing results from the previous assessment assists with recognizing if the patient is improving, responding to treatment, or if their condition is deteriorating. • The need for additional treatment is based upon information gained during reassessment.

Skill Component	Key Concepts
§ Explain the care being delivered and the transport destination to the infant's family or-caregiver	• Communication is important when dealing with the infant, family, or caregiver. This is a very critical and frightening time for all involved and providing information helps in decreasing the stress they are experiencing.

PATIENT REPORT AND DOCUMENTATION	
Skill Component	**Key Concepts**
§ Give patient report to equal or higher level of care personnel	• Report should consist of all pertinent information regarding the assessment finding, treatment rendered and infant's response to care provided.
§ Verbalize/Document: • Event leading up to the obstruction • Cause of obstruction – type of obstruction/foreign body • Observed or reported signs of obstruction: - skin signs - absent or inadequate respirations • Response to obstruction maneuver • Reassessment of airway • Additional treatment provided	• Documentation must be on either the Los Angeles County EMS Report, departmental Patient Care Record form or ePCR.

Developed: 10/01 Revises: 10/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

AIRWAY EMERGENCY: INFANT AIRWAY OBSTRUCTION

Supplemental Information

INDICATIONS:

- Infants who show signs of mild or severe airway obstruction

CONTRAINDICATIONS:

- None when the above condition applies.

COMPONENTS OF AN AIRWAY BAG:	
BMV devices – adult, child, infant	**Portable suction**
OP/NP airways – all sizes	**Suction equipment– various sizes**
Nasal cannula	**Portable oxygen cylinder and oxygen regulator**
Simple face mask – adult, child, and infants	**Pulse Oximeter**
Non-rebreather – adult, child, and infants	**Water soluble lubricant**

NOTES:

- An infant is defined as < 12 months of age.
- Some signs of inadequate breathing are: respiratory distress, fast/slow respirations, bradycardia, stridor, cyanosis, poor perfusion, and altered LOC.
- **DO NOT** perform a blind finger sweep. This may force object further down trachea. If the object is seen and can easily be removed, remove it.
- An infant who is altered should be placed in a position to protect the airway to reduce the chance of the airway being occluded by the tongue and protected from aspiration of mucus or vomit.
- The tongue and epiglottis may obstruct the entrance of the trachea due to inspiratory efforts creating negative pressure in the airway.
- Any infant who received chest thrusts should be medical evaluated to ensure there are no complications, injuries, or retained foreign body fragments.
- **DO NOT** hyper-ventilate the patient. Hyperventilation reduces the success of survival due to cerebral vasoconstriction resulting in decreased cerebral perfusion. In addition, hyperventilation increases intrathoracic pressure and decreases venous return to the heart resulting in diminished cardiac output. ***Rescuers have a tendency to ventilate too rapidly.***
- Unstable patients are patients who have abnormal vital signs, signs/symptoms of poor perfusion, or if there is a suspicion that the patient's condition may deteriorate.
- To make compressions as effective as possible, place the infant on a firm surface if possible. Soft surface make compressions less effective due to pushing the infant down into the soft surface.

Figure 43. Relief of choking in an infant. **A,** Back slaps. **B,** Chest thrusts.

AHA Guideline ECC 2015

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

CARDIAC EMERGENCY: CARDIOPULMONARY RESUSCITATION INFANT - 1 and 2 RESCUER CPR

PERFORMANCE OBJECTIVES
Assess signs of cardiopulmonary arrest in an infant and perform one (1) and two (2) person cardiopulmonary resuscitation in compliance the 2015 Emergency Cardiac Care (ECC) standards.

CONDITION
Assess for signs of cardiopulmonary arrest and perform resuscitative measures as needed for an infant who appears to be unresponsive. Necessary equipment will be adjacent to the manikin or brought to the field setting.

EQUIPMENT
Infant CPR manikin, bag- mask- ventilation device, O_2 connecting tubing, oxygen source with flow regulator, AED, oropharyngeal airway appropriate for manikin, silicone spray, water-soluble lubricant, 10cc syringe, suction, goggles, masks, gown, gloves, emergency resuscitation tape, timing device.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated by the scenario.
- Items identified by (§) should be practiced.
- Ventilations and compressions must be at least at the minimum rate required.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions	• Mandatory personal protective equipment – gloves at all times • Situational - long sleeves, goggles, masks, gown as needed
♦ Assess scene safety/scene size-up ** ***Consider spinal motion restriction (SMR)- <u>if indicated</u>***	• If trauma is suspected, treat as trauma (determined by environment and information obtained from bystanders). **<u>Rescuers must consider the possibility of child abuse in infant cardia arrests</u>**. • Depending on the size of the infant and if SMR is required, an additional rescuer is needed to maintain in-line axial stabilization.
♦ Determines if additional BSI is needed	• Situational - goggles, masks, gown
§ Approaches the infant and explains the care being delivered and transport destination to the patient/caregiver	• Communication is important when dealing with the patient, family, or caregiver. This is a very critical and frightening time for all involved and providing information helps in decreasing the stress they are experiencing.

PROCEDURE	
Skill Component	**Key Concepts**
♦ Check responsiveness: ** ***Tap the heel of the foot and shout "Are you OK?"***	• Tap the infant's shoulder or the heel of the infant's foot and shout "Are you OK?" • Healthcare providers must call for help upon finding an infant unresponsive while continuing to assess the breathing and pulse. A goal is to get the correct size resuscitative equipment to the scene ASAP. • AEDs are rarely required during a pediatric resuscitation. Hypoxia and shock states are the most common causes of infant cardiac arrest. • CPR should not be initiated in children who meet the criteria for: Reference No. 814 or 815. • In a pediatric arrest, it is important to provide oxygenation and ventilation.

Skill Component	Key Concepts
♦ Call for additional resources – <u>if needed</u> ***Calls for ALS (911)*** ***Request an AED - <u>if not already on scene</u>*** ***If the event was NOT witnessed, perform about two (2) minutes (5 cycles of 30:2 or 10 cycles of 15:2) CPR prior to leaving the childt to call 911***	• <u>If two (2) rescuers</u> are present, the 2nd rescuer should contact ALS and get the AED. • <u>If four (4) team</u> members are present: One (1) rescuer calls for ALS and defibrillator One (1) rescuer initiates chest compressions Two (2) rescuers provides ventilation
♦ Check for a brachial pulse while simultaneously assessing for breathing: ***Assess for a brachial pulse for no less than 5 seconds but for no longer than 10 seconds*** ***Assess breathing for up to 10 seconds***	• The brachial pulse is located on medial aspect of the upper arm, midway between the infant's elbow and shoulder. • Care must be taken to avoid placing excessive pressure on the brachial pulse. Pressing too hard may obliterate the pulse in an infant. • Assess for the presence of a brachial at the same time as assessing for abdominal rise and fall (breathing) for up to 10 seconds. • It can be difficult to determine the absence or presence of a pulse in an infant. Therefore if you do not feel a pulse within 10 seconds and the infant is unresponsvie, begin compressions. • Palpating for the presence of a brachial pulse should be performed on **same side** as the rescuer. **DO NOT** reach across the body. The brachial pulse is found on the medial aspect of the upper arm between the elbow and shoulder. • An alternative to palpating the brachial pulse is to utilize a stethoscope to auscultate an apical heart rate (each lub-dub= 1 beat) • The infant's head must be kept in the neutral position. Maximize airway patency by positioning the infant with the neck in a neutral position so that the external ear canal is level with the top of the infant's shoulder. • Agonal gasps are not breathing but may be present in the 1st several minutes after sudden cardiac arrest. • Gasps may sound like a snort, snore, or groan • If more than 2 rescuers, the 3rd rescuer should open the airway and start ventilations.
♦ Place the infant on a hard surface or onto the rescuer's thigh	• Chest compressions must be performed on a hard/firm surface. If the patient is on a soft surface, place a CPR board under the infant, move the infant to a table, or place the infant on your thigh. • A hard surface allows for the compression of the heart between the chest wall and the vertebrae for increased blood flow.
♦ Expose the torso	• Exposing the chest aids with proper hand placement on the chest.
♦ Initiate chest compressions: - if no pulse - if pulse < 60 beats/minute with poor perfusion ***Start compression cycle - (C-A-B sequence) Begins with compressions:*** • ***<u>Two (2) finger technique</u> – 1 rescuer*** - Location: Place two (2) fingers in the center of the infant's chest, just below the nipple line - Depth: Compress at least 1/3 of the AP diameter of the chest or about 1 ½ inches - Rate: at least 100-120/minute - Ratio Cycle: 30 compressions to two (2) ventilations	• **<u>DO NOT DELAY THE INITIATION OF CHEST COMPRESSIONS.</u>** • If an infant has a pulse rate of less than 60/minute with poor perfusion, CPR must be initiated. Bradycardia in infants causes the cardiac output to be insufficient for adequate perfusion and cardiac arrest may be imminent. • Chest compressions should be initiated if you are unsure that if the infant has a pulse. Unnecessary CPR is less harmful than if CPR is not performed when indicated. • The universal rate for compressions in all cardiac arrest patients is 100 to 120/minute with the exception of the neonate. • Techniques for chest compressions when performing CPR: - **Two (*<u>2) finger technique</u>*** – two (2) finger pads of either index & middle finger or middle & ring finger of one hand on lower 1/2 of sternum.

Continued… • ***Two* (2) T*humb-encircling technique* – *2 rescuer*** - Location: center of the chest just below nipple line - Depth: about 1/3 the AP diameter (4cm) of chest circumference - Rate: at least 100-120/minute - Ratio cycle: 15 compressions to two (2) ventilation ***** DO NOT compress on or near the xiphoid process*** ***** Allow for full chest recoil*** ***** Use AED to analyze the rhythm as soon as it is available and after every two (2) minutes of CPR. (approximately five (5) cycles), if indicated***	Continued… - ***Two* (2) *thumb-encircling technique*** *(two (2) rescuer CPR)* – Use both thumbs side by side in the center of the chest. • It is important to allow for full recoil of the chest at the end of each compression and minimize interruptions and delays of chest compressions to 10 seconds or less. • Slightly elevate chest so that head and neck remain in neutral position and the neck is not flexed or hyperextended. • The two (2)-thumb-encircling technique is preferred over the two (2) - finger technique because it produces improved blood flow. • The viability of organs is directly affected by perfusion and oxygenation. The longer an infant is without CPR, the greater the damage to vital organs. • Cardiac arrest in an infant is rarely from a cardiac event. Cardiac arrest in an infant is typically respiratory in nature. • The AED should be used as soon as it is available. Continue CPR while charging. • Some AED models are designed for both pediatric and adult use. If an attenuator system is not available, use adult pads and AED.

MAY SWITCH TO AED SKILL HERE	
Skill Component	**Key Concepts**
♦ Resume chest compressions immediately after a shock had been delivered	• Pulse checks **ARE NOT** performed after a shock has been delivered. • By resuming chest compressions after shocking the patient, the chances for ROSC are increased.
♦ Open/Maintain a patent airway: • Medical - head-tilt/chin-lift • Trauma—jaw-thrust - neutral position (tragus of ear level with top of shoulder) ***** Clear/suction airway - if indicated*** *****Inserts an OP airway - indicated***	• The use of shoulder padding maintains proper airway and spinal alignment. • The tongue is proportionately large in size to the oropharynx and may cause partial or complete airway obstruction in infants. • The infant's airway is more compliant and may collapse during respiratory effort. The airway is easily obstructed by mucus, blood, pus, edema, external compression and hyperextension. • Infants have limited lung expansion and depend more on diaphragm movement to generate a tidal volume. • If suspected trauma, the head and torso should be turned as a unit. • A second rescuer is needed to maintain in-line axial stabilization if spinal motion restriction is required. • The tongue and epiglottis may obstruct the entrance of the trachea due to inspiratory efforts creating negative pressure in the airway. • The infant's airway is more compliant and may collapse during respiratory effort. The airway is easily obstructed by mucus, blood, pus, edema, external compression and hyperextension
♦ Manage ventilations with a BMV device: ** Place BMV device or pocket mask over infant's nose and mouth and deliver two (2) breaths with BMV device or pocket mask, each breath over one (1) second while watching for visible chest rise. **** Insert an oral airway *if indicated*** ***** Ventilate at a rate of 12-20/min (one (1) breath every 3-5 seconds*** ***** Ensure adequate chest rise*** ***** Avoid ventilating too rapidly*** ***** Avoid excessive volume***	• Keep the head in the neutral position. Maximum airway patency by positioning the infant with the neck in a neutral position so that the external ear canal is level with the top of the infant's shoulder. • Rescue breathing is one (1) breath every 3-5 seconds (12-20/minute). Give each breath over one (1) second. Hypoxia results in bradycardia. • Use of an NP airway is contraindicated in infants due to the small diameter of the nares and the presence of adenoidal tissue. • If the airway is open and it is difficult to compress the bag and air leaks around the seal, an airway obstruction is present. • To ventilate, use *only* enough force to produce visible chest rise. Over-inflation causes gastric distention and elevating the diaphragm which will affect tidal volume.

	Continued… • EMS personnel often deliver ventilations **too** rapidly during CPR which may result in: - increased intrathoracic pressure and impedance of venous return resulting in decreased cardiac output, cerebral blood flow, and coronary perfusion - increases risk of regurgitation and aspiration in children without an advanced airway
Skill Component	**Key Concepts**
♦ Switch roles after about two (2) minutes (five (5) cycles of 30:2 or 10 cycles of 15:2) – *if additional rescuers are available* ***** Resumes CPR beginning with compressions and ending with ventilation at a rate of 100-120/minute*** ***** Establishes a compression to ventilation ratio of 30:2 for one rescuer and 15:2 for two (2) rescuers.*** ***** Delivers two (2) breaths (Each breath over one (1) second)*** ***** Completes about two (2) minutes of CPR***	• Switching roles about every 2 minutes (five (5) cycles of 30:2 or 10 cycles of 15:2) prevents rescuer fatigue. • Switching duties should take less than five (5) seconds. • If using an AED, make the switch when the AED is analyzing the rhythm to minimize interruptions and delays in compressions to 10 seconds or less. • The universal rate for compressions in all cardiac arrest victims is 100 to 120/minute with the exception of the neonate. • A compression cycle consists of 30 compressions to two (2) ventilations for a single rescuer. • Five (5) compression cycles of 30:2 should take approximately Two (2) minutes. • 10 cycles of 15:2 should take approximately two (2) minutes. • Technique for chest compressions when performing CPR: - ***Two 2 finger technique*** – Two (2) finger pads of either index & middle finger or middle & ring finger of one (1) hand on lower 1/2 of sternum - ***Two 2 thumb-encircling technique*** *(2 rescuer CPR)* – Use both thumbs side by side
♦ Continue CPR until ALS arrives or patient shows signs of return of spontaneous circulation (ROSC) • If circulation is present and breathing is normal – place in recovery position and monitor • If circulation present, but breathing is absent or inadequate - continue with rescue breathing 12-20 ventilations/minute (one (1) breath every 3-5 seconds) • If no circulation present - continue CPR ratio of 15:2 ****** ***Start compressions - if heart rate is less than 60/minute with poor perfusion***	• Signs of ROSC include movement and/or response to verbal or tactile stimuli. • If there has been no ROSC after 20 minutes of EMS resuscitation and there are no other resources are enroute, consider transport to the nearest receiving hospital -- Reference No. 510.

IF RETURN OF SPONTANEOUS CIRCULATION

Skill Component	Key Concepts
♦ Re-assess patient at least every five (5) minutes after return of spontaneous circulation (ROSC): • Check for: - **R**esponsiveness - **P**ulse - **B**reathing	• The main considerations post-resuscitation are: - Perform pulse check about every five (5) minutes. - Perform a primary and pertinent secondary assessment every five (5) minutes. • The use of positive pressure ventilation is indicated when a pulse is present but the infant is not breathing adequately. • Signs of poor perfusion are cool extremities, pallor, mottling, cyanosis, delayed capillary refill and continued decline of level of consciousness.

♦ Perform rescue breathing (covering the nose and mouth) - *if indicated* • Ventilation rate: - BMV device - 12-20 breaths/minute (one (1) breath every 3-5 seconds) - Each breath over one (1) second)	• If respirations are absent or inadequate the rescuer must open the airway and ventilate the infant to prevent cardiac arrest and hypoxic injury to the brain and other organs. • Hypoxia may result in bradycardia and cardiac arrest. • Infants should be managed with a BMV device and insertion of an oropharyngeal airway.

RE-ASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
§ Re-assess the patient at least every five (5) minutes or sooner once the obstruction is relieved • Check for: - **R**esponsiveness - **P**ulse - **B**reathing *****Manage patient condition as indicated.***	• Infants who are, or were, n cardiac arrest are priority patients and must be re-evaluated at least every five (5) minutes or sooner. • Evaluating and comparing results from the previous assessment assists with recognizing if the patient is improving, responding to treatment, or if their condition is deteriorating. • The need for additional treatment is based upon information gained during reassessment. • The main considerations of post-resuscitation are: - Check for a pulse about every five (5) minutes - Perform a primary and pertinent secondary assessment at least every five (5) minutes.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Give patient report to equal or higher level of care personnel	• When giving a report to a higher level of care, it should consist of all pertinent information regarding the assessment finding, treatment rendered and patient response to care provided.
§ Verbalize/Document: • Documentation elements on EMS Report form should include: - if the arrest was witnessed - if CPR was initiated and by whom - the time CPR was initiated- if applicable - If the AED indicated that a shock was advised or no shock was indicated - the time from the arrest until the onset of CPR - response to treatment/defib - organ or tissue donor	• EMS Personnel are defined as EMTs and paramedics. *Law enforcement and EMS personnel off duty who may have started CPR are considered citizens for documentation purposes.* • The time of arrest cannot be determined in an unwitnessed arrest. However, documenting when the infant was last seen may be helpful. • It is extremely difficult to assess a brachial pulse during CPR in an infant. • Response to CPR – infant regains pulse and/or respirations or remains pulseless and/or apneic. • Documenting reassessment information provides a comprehensive picture of patient's response to treatment. • Last assessment information, before patient care is transferred to ALS or hospital staff should be documented on the EMS form. • Documentation must be on either the Los Angeles County EMS Report or departmental Patient Care Record form or ePCR.

Developed: 8/01 Revised: 10/18

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

CARDIAC EMERGENCY / CARDIOPULMONARY RESUSCITATION

INFANT - 1 and 2 RESCUER CPR - Supplemental Information

DEFINITIONS:

- *Newborn* - Neonate in the first minutes to hours after birth.
- *Neonate* - Infant in first month after birth (28 days).
- *Infant* – Newborn to one (1) year (0 - 12 months).

INDICATIONS:

- Infants who are unresponsive, apneic, and pulseless and/or
- Heart rate is < 60 beats per minute

CONTRAINDICATIONS:

- None when above conditions apply.

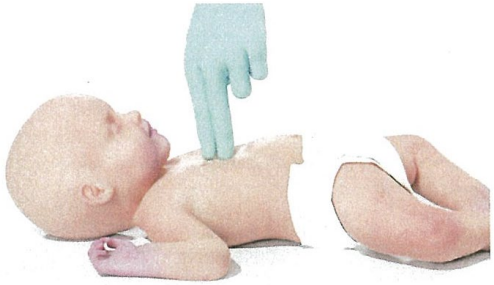


Figure 30. Two-finger chest compression technique for an infant.

American Heart Association 2015

COMPLICATIONS:

- Gastric distention
- Rib fractures
- Sternal fractures
- Separation of ribs from sternum
- Laceration of liver or spleen
- Pneumothorax
- Hemothorax
- Lung and heart contusion
- Fat emboli

PRECAUTIONS:

- EMS personnel often deliver excessive ventilations during CPR which may result in:
  - increased intrathoracic pressure and impedance of venous return resulting in decreased cardiac output, cerebral blood flow, and coronary perfusion.
  - air trapping and barotraumas in children with small-airway obstruction.
  - increases risk of regurgitation and aspiration in children without an advanced airway.

NOTES:

- Neutral position was once called “the sniffing position.”
- Do not start resuscitation if the patient meets the criteria in Prehospital Care Reference No. 814 or 815.
- If infant meets Reference No. 814 criteria, the infant should be left at the scene and not transported to the hospital.
- Start compression cycle if an infant has no pulse or signs of circulation or if a newborn has a pulse < 60 beats/minute. Even though the newborn or infant has a pulse, the low rate and cardiac output are insufficient to provide for adequate perfusion.
- The viability of organs is directly affected by perfusion and oxygenation and the longer a patient is without CPR, the greater the damage to vital organs.
- Move the infant no more than necessary to ensure an open airway. A second rescuer is needed to maintain in-line axial stabilization if spinal motion restriction is required.
- If the infant is in a prone position with suspected trauma, the patient should be turned using log-roll method to avoid flexion or twisting of the neck or back.
- The recovery position is not recommended for an infant unless the head is adequately supported since the airway may become obstructed. Have suction readily available to prevent airway obstruction by mucus or vomit.
- In infants and children, the most common cause of arrest is an inadequate airway. Complete about two (2) minutes of CPR to remove obstruction or provide 5 cycles 30:2 (for 1 rescuer) or 10 cycles15:2 (for two (2) rescuers) of CPR before leaving the infant to call for EMS personnel.
- Other signs of circulation are: breathing, coughing or movement in response to rescue breaths. This is checked in conjunction with palpating for a pulse.
- An alternative to palpating the brachial pulse is by utilizing a stethoscope to auscultate an apical heart rate (lub-dub = 1 heartbeat)
- Chest compressions must be performed on a hard surface. If on a soft surface place a board under the infant or move the infant to a table, etc.
- CPR cycle begins with compressions and ends with ventilations.
- Use an oropharyngeal airway when providing positive pressure ventilations.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

CARDIAC EMERGENCY: AUTOMATED EXTERNAL DEFIBRILLATION (AED)

PERFORMANCE OBJECTIVE
Demonstrate competency in assessing signs of cardiopulmonary arrest and performing defibrillation using a semi-automated external defibrillator in compliance the 2015 Emergency Cardiac Care (ECC) standards.

CONDITION
Manage an adult patient who is found unresponsive with no signs of trauma. CPR may or may not be in progress. Necessary equipment will be adjacent to the manikin or brought to the field setting.

EQUIPMENT
Adult CPR manikin, AED trainer, adult defibrillator pads and attenuator (if available), cables, towel, safety razor, bag mask-ventilation (BMV) device, O_2 connecting tubing, oxygen source with flow regulator, oropharyngeal and nasopharyngeal airways (various sizes), silicone spray (for manikin use), pediatric resuscitation tape, 1-2 assistants (optional), suction, goggles, various masks, gown, gloves, timing device.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions required if indicated.
- Items identified by the symbol (§) should be practiced.
- Ventilations and compressions must be performed at the minimum rate required.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions (BSI)	• Mandatory personal protective equipment – gloves must be worn at all times • Situational - goggles, masks, gown as needed
♦ Assess scene safety/scene size-up ** ***Consider spinal motion restriction (SMR) – <u>if indicated</u>***	• If trauma is suspected, manage as a trauma patient, which can be determined by the environment and the information obtained from bystanders.

PROCEDURE	
Skill Component	**Key Concepts**
♦ Assess the patient and initiate BLS procedures: • Check for responsiveness while assessing for breathing 5-10 seconds • Palpate for pulse for up to10 seconds • Start CPR beginning with compressions at a rate of 100-120/min. • Attach AED as soon as available **NOTE:** ***If an airway obstruction is present, the rescuer should perform obstructive airway maneuvers.***	• The AED should **NOT** be applied to any patient who is conscious, has a pulse, is breathing, or meets Reference No. 814 or 815 • The AED will ***<u>only</u>*** shock ventricular fibrillation and ventricular tachycardia. • Early defibrillation is critical in improving the survival of patients in ventricular fibrillation and pulseless ventricular tachycardia. • An AED can be used on an infant and child up to 8 years of age. Over 8 years old treat as for an adult. • Some AED models are designed for both pediatric and adult use. These devices deliver a reduced shock by 67% when pediatric pads are used. • If an attenuator system is not available, use adult pads and the adult electrical dose. *Not treating a shockable rhythm in infants and children has the potential for greater harm than using adult pads and electrical dose.* • Defibrillation stops all chaotic electrical impulses in the heart and allows the pacemaker to re-establish a viable heartbeat.
IF CONTINUING FROM ONE (1) & TWO (2) PERSON ADULT/CHILD/INFANT CPR, MAY BEGIN HERE	

Skill Component	Key Concepts
♦ Position the AED near the patient and the operator	• The AED should be placed near the operator to prevent reaching across the patient to press the "analyze" and "shock" buttons.
♦ Turn on the AED	• Some devices have an ON/OFF button; some turn on when the lid is opened. Once the AED is turned on, **DO NOT** turn off until the patient has been transferred to a higher medical care provider.
♦ Expose the chest – *if not already done*	• The chest must be exposed prior to placing the AED pads
♦ Prepare pad sites for secure pad contact	• Metal surfaces do not pose a hazard to either patients or EMS providers. • Water conducts electricity and may provide a pathway for energy from the AED to the provider or bystanders or from one electrode pad to another. • If the patient is lying in water, move them to a drier area. • It is safe to use the AED snow or rain. • If the patient is wet, dry them off prior to placing the AED pads on the chest • Medication patches can block the delivery of energy to the heart and cause minor burns due to arcing. If medication pads would interfere with AED pad placement, remove them. • Chest hair may prevent the pads from adhering to the chest. Use a safety razor to shave the area where pads will be placed. A second set of pads may be used to epilate the chest hair if they are available. • Body jewelry to the torso may cause arcing and skin burns. Attempts should not be made to remove jewelry. If no other placement is available, place the pads directly over the jewelry. • Placing AED pads over pacemakers or implantable cardioverter defibrillators (ICDs) may reduce the energy delivered to the heart and damage these devices. Therefore, **DO NOT** place the pads over these devices. Place the pads about 1" from these devices.
♦ Apply the AED pads (must not touch or overlap): • **Adult** - Upper - right sternal border directly below the clavicle - Lower - left mid-axillary line, 5th - 6th intercostal space with top margin below the axilla • **Children/Infants < eight (8) years of age** - Anterior-Posterior 1st pad anterior over sternum between nipples 2nd pad posterior between shoulder blades - Anterior-Anterior - Right pad – wrap over a small child's shoulder - Left pad – left anterior to cover mid-clavicular and mid-axillary lines	• Some manufacturers recommend that pads are placed on specific sites/sides – follow the manufacturer's guidelines. • AED pads must **NOT TOUCH EACH OTHER.** Place them about 1" apart. • If a child is older than 8 years-of-age or more than 55 pounds, use adult defibrillation pads. • When pads touch, arcing may occur and result in skin burns. • When pads overlap, the AED is unable to read the rhythm and will result in "no shock advised." • If you are using an AED for an infant or child less than eight (8) years of age and the AED does not have child pads, you may use adult pads. The pads may need to be placed anterior and posterior so that they do not touch each other. • If the AED does not have a pediatric dose of energy, use the adult dose.

Skill Component	Key Concepts
♦ Stop CPR while analyzing for a shockable rhythm and	• The AED is unable to analyze the rhythm when there is artifact derived from touching the patient, chest

follows the voice prompts *****Ensure no one is touching the patient*** *****If shock advised*** • Continue chest compressions while charging the AED *****If no shock advised*** • Resume chest compressions and breaths immediately	compressions, poor pad contact, or other communication devices. This may result in the prompt to defibrillate when the patient is not in ventricular fibrillation or ventricular tachycardia. • If there is no pulse and the AED indicates "shock," perform CPR while the AED is charging. • Minimize a delay in chest compression to 10 seconds or less. • The pulse is **NOT CHECKED** immediately after defibrillation since palpating the pulse delays compressions and the resumption of circulation. • Resuming chest compressions immediately after delivering a shock helps to correct acidosis by providing oxygen and perfusion to the myocardium. This increases the heart's ability to pump blood more effectively after the shock.
♦ Continue chest compressions and breaths at a ratio of 30:2, until ALS arrives, **OR** return of spontaneous circulation (ROSC) **OR** meets Los Angeles County Reference No. 814 criteria	• Los Angeles County Reference No. 814 Determination /Pronouncement of Death in the Field A. 1-12 – specifies when EMS personnel may determine death in the field. • Los Angeles County Reference No. 815 Honoring Prehospital Do Not Resuscitate orders – specifies the procedures to be taken when a dying patient has a Do Not Resuscitation Order or an Advanced Health Care Directive.
IF RETURN OF SPONTANEOUS CIRCULATION:	
Skill Component	**Key Concepts**
♦ Re-assess patient every five (5) minutes after ROSC: • Check for: - responsiveness - pulse - breathing ** ***Provide rescue breathing- if indicated*** ** ***Obtain baseline vital signs*** ** ***Place in position to the protect airway - if patient has adequate respirations***	• The three (3) main considerations post-resuscitation are: - Perform pulse check about every five (5) minutes. - Perform a primary and pertinent secondary assessment at least every five (5) minutes. - Keep AED turned on and attached to patient enroute unless switched to a manual monitor/defibrillator mode or unit. • If the patient loses pulses during transport, **DO NOT ANALYZE WHILE DRIVING**. To analyze rhythm, the ambulance must pull over and **STOP**. • If a pulse is present and the patient is not breathing adequately, deliver ventilations by utilizing a BMV device. • Placing the patient in left lateral position decreases the risk of aspiration. However, if the patient's airway has been secured within an endotracheal tube, left lateral position is **NOT RECOMMENDED.**

Skill Component	Key Concepts
♦ Perform rescue breathing - <u>if indicated</u> • Ventilation rates using BMV or barrier device: - Adult: 10-12 breaths /minute (one (1) breath every 5-6 seconds) - Child/infant: 12-20 breaths/minute (one (1) breath every 3-5 seconds) - **Advanced airway:** 10 breaths/minute (one (1) breath every six (6) seconds) § Explain the care being delivered and the transport destination to the caregivers	• If respirations are absent or inadequate the rescuer must open the airway and ventilate the patient to prevent cardiac arrest and hypoxic injury to the brain and other organs. • Hypoxia may result in bradycardia and followed by cardiac arrest. • Communication is important when dealing with the patient, or caregiver. This is a very critical and frightening time for all involved and providing information helps in decreasing the stress they are experiencing.

RE-ASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
♦ Repeat an ongoing assessment a minimum of every five (5) minutes once the child has return of spontaneous respirations and circulation: • Primary assessment • Relevant portion of the secondary assessment • Vital signs	• This is an unstable patient and must be re-evaluated a minimum of every five (5) minutes or sooner, if any treatment is initiated, medication administered, or condition changes.
♦ Evaluate results of reassessment and compare to baseline condition and vital signs ***Manage patient's condition as indicated.**	• Evaluating and comparing results with the baseline information assists with determining if the patient is improving, responding to treatment, or if their condition is deteriorating.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Verbalize/Document: • Documentation elements on the EMS Report form should include: - if the arrest was witnessed - if CPR was initiated and by whom - the time CPR was initiated- if applicable - If the AED indicated that a shock was advised or no shock was indicated - the time from the arrest until the onset of CPR - response to treatment/defib - organ or tissue donor	• EMS Personnel are defined as EMTs and paramedics. Law enforcement and EMS personnel off duty who may have started CPR are considered citizens for documentation purposes. • The time of arrest cannot be determined in an unwitnessed cardiac arrest. However, documenting when the patient was last seen may be helpful. • When assessing for pulses with CPR in progress, have an additional rescuer palpate for a pulse. If there is no pulse with compressions this may be due to inadequate compressions or hypovolemia. • Response to CPR –The patient regains a pulse and/or respirations or remains pulseless and/or apneic. • Documenting reassessment information provides a comprehensive picture of patient's response to treatment. • Documentation must be on either the Los Angeles County EMS Report, ePCR, or departmental Patient Care Record form.

Developed 1/01 Revised 10/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

CARDIAC EMERGENCY: AUTOMATED EXTERNAL DEFIBRILLATION (AED)

Supplemental Information

INDICATIONS:

- Patient unresponsive to stimuli, non-breathing, and pulseless. (The AED will shock patients with a pulse if they are in ventricular tachycardia).

CONTRAINDICATIONS:

- Patients who are awake, have a pulse, or are breathing
- Patients who meet conditions outlined in Reference No. 814 or 815.

COMPLICATIONS:

- Burns to chest
- Inappropriate shocks or failure to shock

NOTES:

- Honor the patient's wishes if they have a valid Advance Health Care Directive, POLST, or Prehospital Do Not Resuscitate order.
- The initial priority in cardiac arrest is to use the AED as soon as it is available because the "pump" is still primed.
- Never use the AED to triage or monitor patients who complain of chest pain and are awake, breathing or have a pulse.
- CPR prior to defibrillation results in improved survival rates.
- The AED operator is responsible to ensure that no one touches the patient when the AED is analyzing or when shocks are given.
- The arcing of electricity results in burns to the chest and/or the myocardium not receiving an appropriate electrical charge.
- Some manufacturers recommend that pads are placed on specific locations on the patient. Follow the manufacturer's guidelines.
- An AED may be used in trauma if there is a reasonable suspicion that the accident was caused from a cardiac event.
- With most defibrillators, the 1st shock eliminates ventricular fibrillation more than 85% of the time. If the 1st shock fails, resumption of chest compressions is likely to be of a greater value than another shock.
- The time it takes to analyze the cardiac rhythm results in a delay of CPR resulting in ineffective circulation. Therefore, chest compressions should be initiated and resumed within 10 seconds after a shock has been delivered. Follow the voice prompt.
- Careful consideration should be made when determining the appropriate time to transport. Chest compressions in the back of a moving ambulance are generally ineffective.

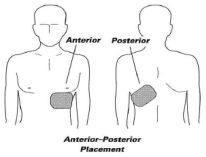
CARDIAC EMERGENCY: AUTOMATED EXTERNAL DEFIBRILLATION (AED)

Supplemental Information (Continued)

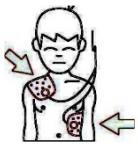
DO NOT modify pads under any circumstances

Adult: Anterior-Anterior

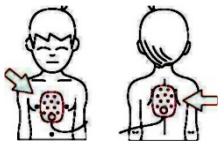
Adult: Anterior-Posterior



Child/Infant: Anterior-Anterior



Child/Infant: Anterior-Posterior



LOS ANGELES COUNTY EMS REFERENCE NUMBERS:

- 502 - Patient Destination
- 510 – Pediatric Patient Destination
- 814 - Determination/Pronouncement of Death in the Field
- 815 - Honoring Prehospital Do-Not-Resuscitate (DNR) Orders
- 815.1 - State of California EMS Prehospital Do-Not-Resuscitate (DNR) Form
- 815.2 - Physician Orders for Life Sustaining Treatment (POLST) Form

Section 4:
Airway

Learn the Facts

You should have a comprehensive understanding of:

- Anatomy & Physiology
- Conditions listed in the index
- Glossary words
- Medical terms listed in each chapter
- Pathophysiology

Understand the Concepts

You should have an extensive understanding of the following:

1. Adult ventilation rates and adequate volumes
2. Alpha and beta receptors
3. Complications associated with tracheostomy tubes
4. Complications of hyperventilation
5. Dyspnea/Nocturnal dyspnea
6. Hyperventilation
7. Hypoxic drive
8. Lung sounds associated with various illnesses
9. Pathophysiology of Congestive Heart Failure (CHF)
10. Pathophysiology of COPD
11. Pathophysiology of the upper and lower airway
12. Tension pneumothorax

Perform the Skills

Finally, you should be able to:

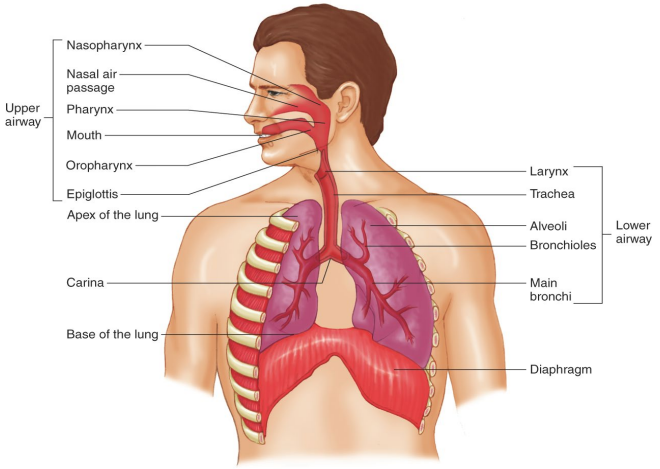
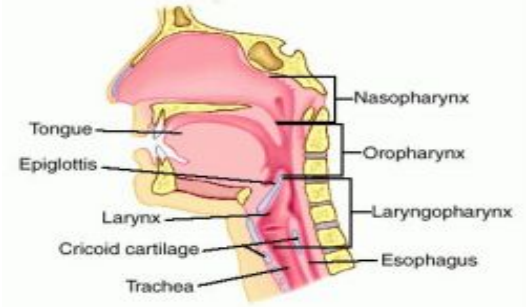
1. Administer respiratory medication
2. Assess a patent airway
3. Employ various techniques for suctioning
4. Evaluate a patient with an asthma exacerbation
5. Evaluate effective bag-valve mask ventilations
6. Evaluate respirations for adequacy
7. Treat and oxygenate patients with COPD

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

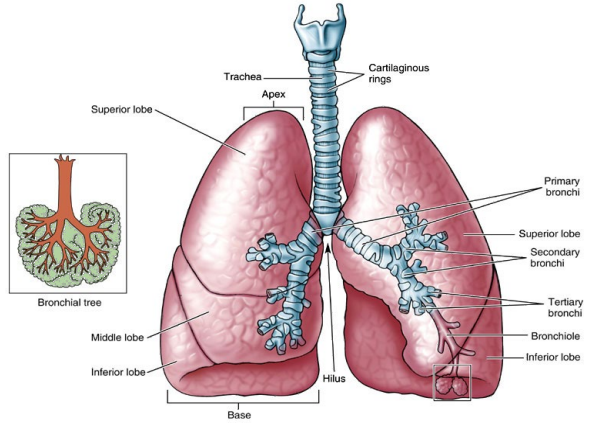
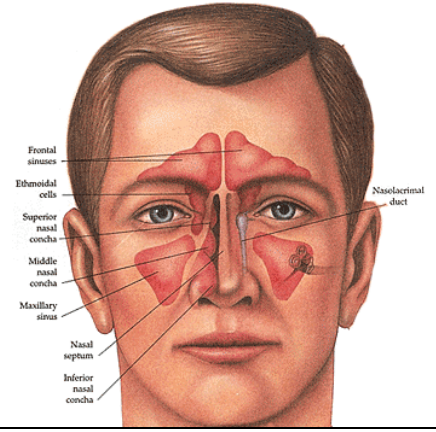
Airway Management

RESPIRATORY SYSTEM ANATOMY

Upon completion of this unit of instruction, the student will be able to:

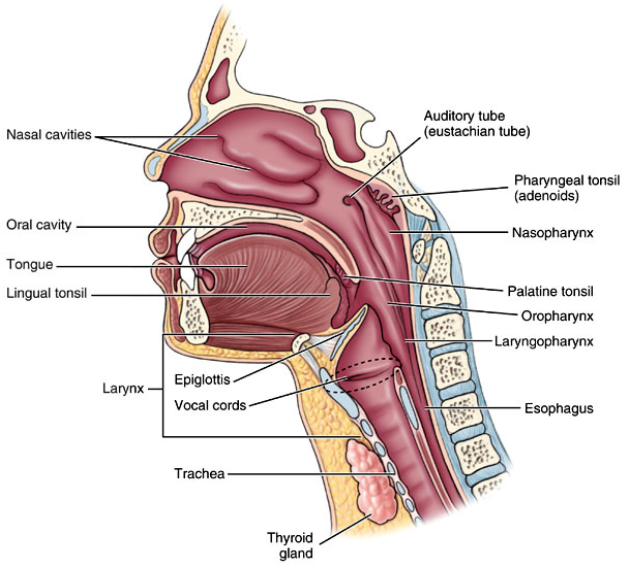
LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
1. Explain the function of the respiratory system.	*Function of the respiratory system:* • Primary purpose is to bring oxygen into the body and eliminate waste products • Provides defense against disease • Helps in controlling pH • Allows for vocalization • Creates blood pressure gradient between the thorax and abdomen which promotes the flow of lymph and venous blood	Respiratory System 
2. Describe where the upper airway starts and stops.	*Location of the upper airway:* • Starts with the nose and mouth and stops at the end of the larynx (glottic opening)	• Glottis includes the true vocal cords and the **"V"** opening in between the cords and opens into the trachea. 

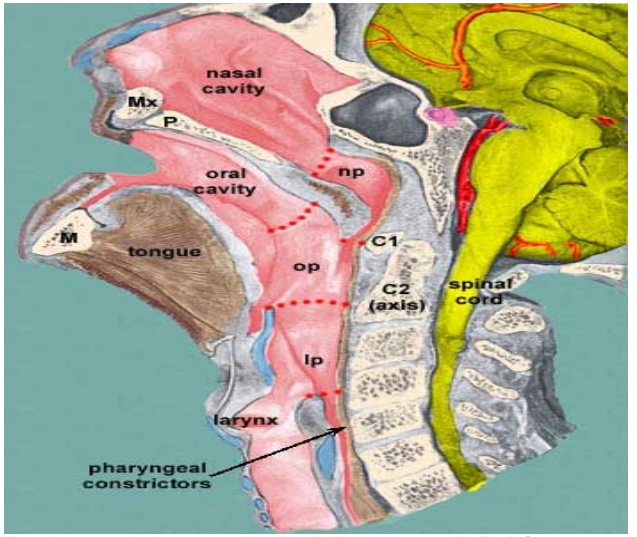
LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE

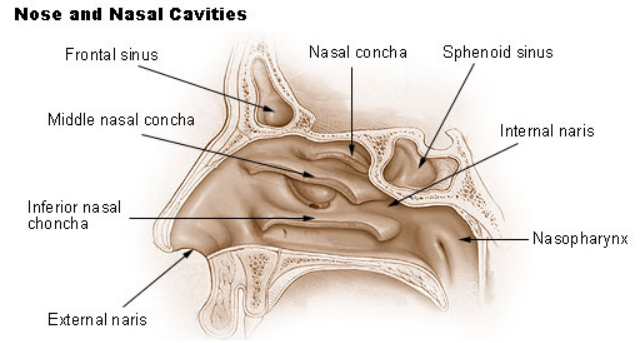
LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
3. Describe where the lower airway starts and stops.	*Location of the lower airway*: • Starts with the trachea and stops with the alveoli	
4. Define and describe the location and the purpose of the cranial sinuses.	*Definition, location and purpose of the cranial sinuses:* • <u>Definition</u> – air-filled bony cavities in the skull and connect with the nasal cavity • <u>Location</u> – face and skull adjacent to the nose • <u>Purpose</u> – not fully understood, but some experts maintain: - exist to lighten the skull - improve vocal resonance - produce special mucus to keep the inside of the nose moist and protects from pollutants, dust, and microorganisms	• There are 4 pairs of sinuses: - frontal sinuses are in the forehead region - maxillary sinuses are in the cheek area - ethmoid sinuses are between the eyes - sphenoid sinuses lie deep in the center of the skull • Sinus cavities act as tributaries for fluid to and from Eustachian tubes and tear ducts. • Sinuses frequently become infected (sinusitis) due to their function of trapping microorganisms. 

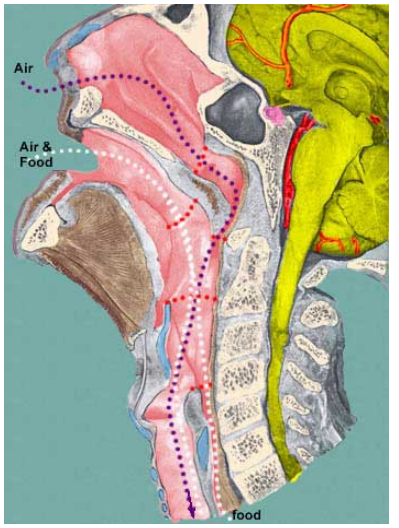
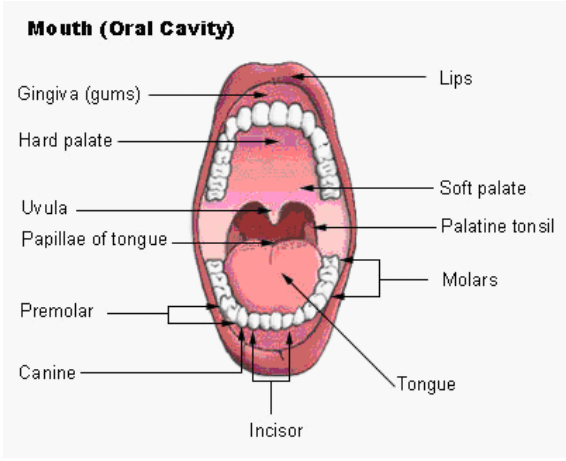
LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
5. Describe and give the function of the eustachian tube.	*Eustachian tube:* • Description – a small canal (tube) that connects the middle ear to the pharynx just behind the soft palate at the level of the nasopharynx • Function - equalizes air pressure on both sides of the tympanic membrane - protects, aerates and drains accumulated secretions, infectious debris from the middle ear and mastoid	• The Eustachian tube is also called the otopharyngeal or the pharyngotympanic tube because it connects to the ear and the pharynx. • Opening and closing of the tubes causes the clicking or popping sound when yawning or chewing. • Occlusion of the Eustachian tube may lead to middle ear inflammation (otitis media).

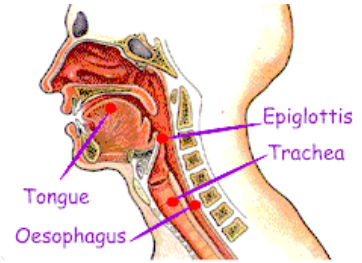
UPPER AIRWAY

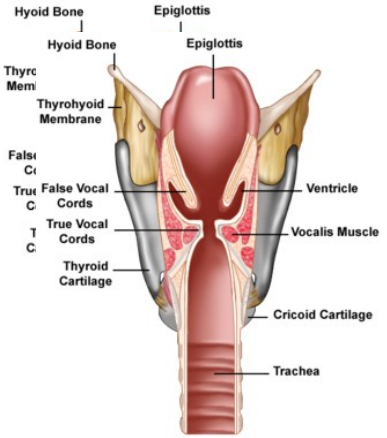
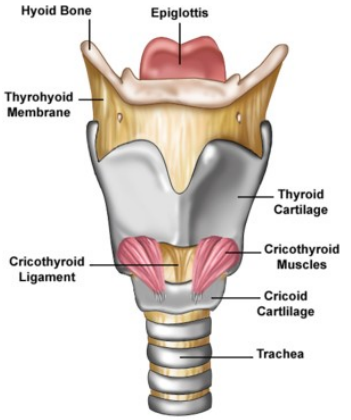
LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
6. Discuss the general facts of the upper airway.	*General facts of the upper airway:* • Extends from the nose and mouth and ends at the end of the larynx (glottic opening) • All structures of the upper airway are located anteriorly and at the midline • Mucous membranes line the entire upper airway tract and caution must be taken when placing airway adjuncts • Function of the upper airway is to warm, filter and humidify the air entering the lungs	• Mucous membranes are extremely delicate and caution must be taken when inserting suction catheters or nasopharyngeal airways. 

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
7. Identify the structures above the larynx that allow for airflow into the respiratory system.	*Structures above the larynx that allow for airflow to enter the respiratory system:* • Nares (nostrils) • Nasal cavity • Nasopharynx (NP) • Oral cavity • Oropharynx (OP) • Laryngeal pharynx (LP) [larynx]	 Reprint permission granted by Wesley Norman PhD, DSc
8. Describe the location and the functions of the nares.	*Location and functions of the nares:* • Location – 2 openings in front of the nose • Functions: - act as air passages for inhalation and exhalation - warms air on inhalation and removes moisture on exhalation.	• Nares are also call nostrils. They contain cartilage called turbinates (nasal conchae) which cause turbulence in airflow. • Airflow turbulence in important by making inhaled particles stick to the mucus coated walls and warms, filters and humidifies the inhaled air. • There are 2 additional nostrils inside the head. These internal nostrils called "choana" and connect the nose to the throat aiding in respiration.
9. Describe the location and the functions of the nasal cavity.	*Location and functions of the nasal cavity:* • Location – occupies the space between the roof of the mouth and the floor of the cranial cavity • Functions: - warms and moistens the inhaled air - filters particles found in the air - resonating chamber for the production of sound	• The nasal cavity is divided into the right and left cavity separated by the nasal septum and lined by mucous membranes. • Large particles are caught by nasal hairs and small particles such as dust and bacteria are trapped by the sticky mucus. • The sinuses connect with the nasal cavity. • The back of the nasal cavity opens into the oropharynx. **(Continued)**

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
		
10. Describe the location of the:	*Location of the nasopharynx, oropharynx, pharynx and laryngopharynx:*	
A. Nasopharynx	A. Nasopharynx – located directly posterior to the nose	A. Nasopharynx • Olfactory tissue is located within the nasopharynx which gives the individual the ability to smell.
B. Oropharynx	B. Oropharynx – located directly posterior to the mouth at the level of the uvula and above the epiglottis	B. Oropharynx • The roof of the mouth separates the oropharynx and nasopharynx. • Air enters the oropharynx more rapidly and directly and is less moist than air entering the nose.
C. Pharynx	C. Pharynx – located where the nasopharynx and oropharynx meet, just above the epiglottis (throat)	C. Pharynx • The pharynx terminates at the entrance of the trachea and esophagus: - trachea – located anteriorly leading to the lungs - esophagus – located posteriorly leading to the stomach • An obstruction at the pharynx prevents airflow into the lower airways.
D. Laryngopharynx	D. Laryngopharynx – extends from the epiglottis to the glottis	D. Laryngopharynx • The glottis consists of the vocal cords and the opening between the cords. The opening closes when swallowing.

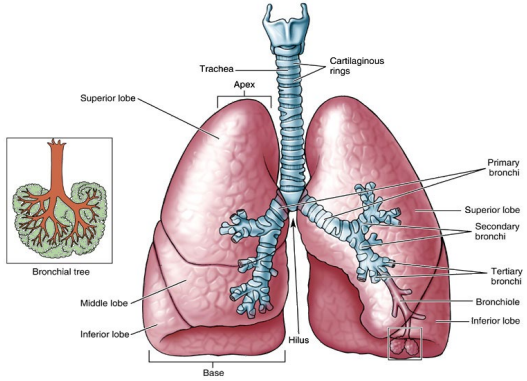
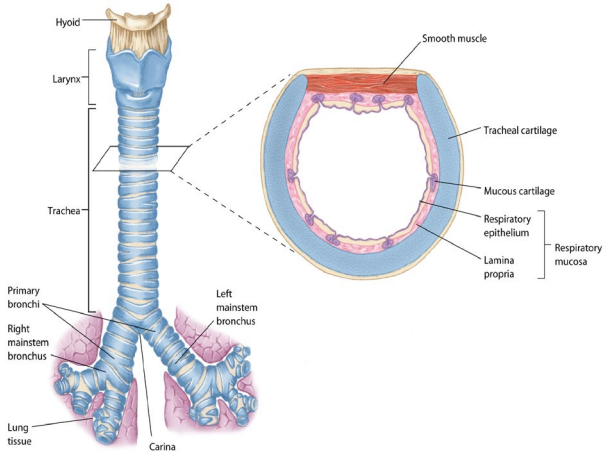
LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
11. Trace the path of airflow from the nares and the mouth to the pharynx.	*Path of airflow from the nares and mouth to the pharynx:* • Nares → nasal cavity → nasopharynx → laryngeal pharynx • Mouth → oral cavity → oropharynx → laryngeal pharynx • The nasal cavity is divided into the right and left cavity separated by the nasal septum and lined by mucous membranes • The nasal and oral cavity merge and allow air to enter into the laryngeal pharynx into to trachea • The oral cavity allows food to travel down to the laryngeal pharynx into the esophagus	 Reprint permission granted by Wesley Norman PhD, DSc ☠ *Mucous membranes are extremely delicate and caution should be taken when inserting suction catheters or nasopharyngeal airways to prevent bleeding that cannot be stopped by direct pressure.*
12. Describe the following structures of the oral cavity and pharynx: A. Tongue B. Vallecula C. Uvula	*Description of the oral cavity and pharynx structures:* A. <u>Tongue</u> – a large muscle attached at the mandible and hyoid bones B. <u>Vallecula</u> – a pocket formed by the base of the tongue and epiglottis C. <u>Uvula</u> –the piece of soft tissue that looks like a punching bag which is part of the soft palate. It extends into the archway where the oropharynx and nasopharynx meet	

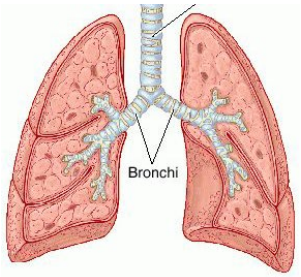
LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
13. Describe the location of the vallecula.	*Location of the vallecula:* • Vallecula is the space between the base of the tongue and the epiglottis	• When using a curved blade to visualize the glottic opening for endotracheal intubation, the blade is placed in the vallecula to keep the epiglottis from covering the trachea allowing an endotracheal tube to pass through the vocal cords and into the trachea.
14. Describe the location and the functions of the epiglottis.	*Epiglottis:* • Epiglottis is a thin, leaf shaped valve covered with a mucus membrane, attached to the root of the tongue and closes over the glottis • Protects the opening of the trachea to allow for air to enter, but prevents food or liquid from entering the larynx and trachea	• To visualize the glottic opening a straight blade is used for endotracheal intubation, the blade is placed just under the epiglottis so that the endotracheal tube can be passed through the vocal cords into the trachea. • In children and to a lesser degree in adults, the epiglottis will occasionally become infected with Haemophilus influenza and Streptococci in the trachea, causing massive inflammation called "epiglottitis". 
15. Describe the location and the functions of the larynx.	*Location and function of the larynx:* • Location - The larynx lies just below the epiglottis and above the trachea attached to the hyoid bone • Function - facilitate the passage of air - prevent foreign material to enter the lungs - produce speech	• The larynx is commonly known as the voice box. • The pharyngeal and laryngeal branches of the vagus nerve transmit motor impulses to the pharynx and larynx. ☠ *Stimulation when suctioning, inserting an ET tube or placing a perilaryngeal airway may cause constriction of the bronchi, bradypnea, bradycardia or hypotension.*

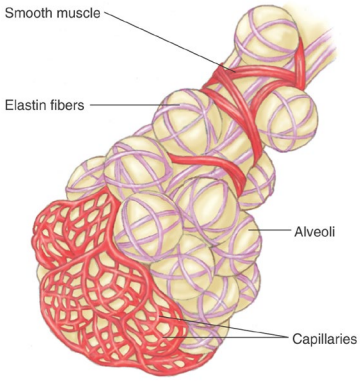
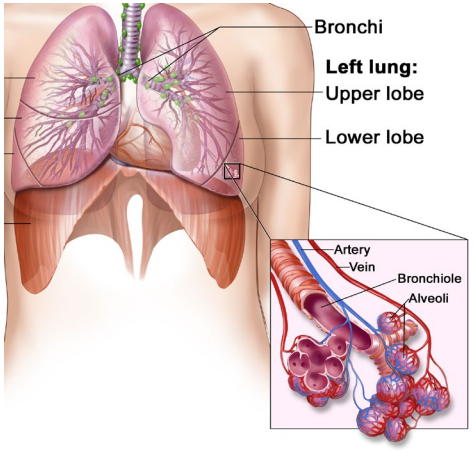
LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
16. List the main structures of the larynx.	*Main structures of the larynx:* • Thyroid cartilage • Cricoid cartilage • Cricothyroid membrane • Vocal cords • Glottic opening	Anterior view  Posterior view  Anterior view

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
7. Describe the characteristics of the following structures of the larynx:	*Characteristics of the structures of the larynx:*	
A. Thyroid cartilage	A. <u>Thyroid cartilage</u> (Adam's Apple) • Lies anteriorly • Is shield shaped and composed of cartilage anteriorly and smooth muscle posteriorly • The epiglottis is attached to the superior aspect of the thyroid cartilage	
B. Cricoid cartilage	B. <u>Cricoid cartilage</u> • Lies inferiorly to the thyroid cartilage • Is the only cartilage that forms a complete ring	
C. Cricothyroid membrane	C. <u>Cricothyroid membrane</u> • Is a vascular superficial membrane located between the thyroid and cricoid cartilages • Is used for surgical and an alternative access to the airway	
D. Glottic opening	D. <u>Glottic opening</u> – is the space between the vocal cords where the upper airway ends and the lower airway begins (beginning of the trachea)	
E. Vocal cords	E. <u>Vocal cords</u> – have white bands of cartilage that vibrate to make sound and used as a landmark for endotracheal intubation	
F. False vocal cords	F. <u>False vocal cords</u> – folds of tissue that help close the glottis when swallowing	• False vocal cords play no role in production of speech, but assist in closing the glottic opening to prevent aspiration of solid or liquid matter.

LOWER AIRWAY

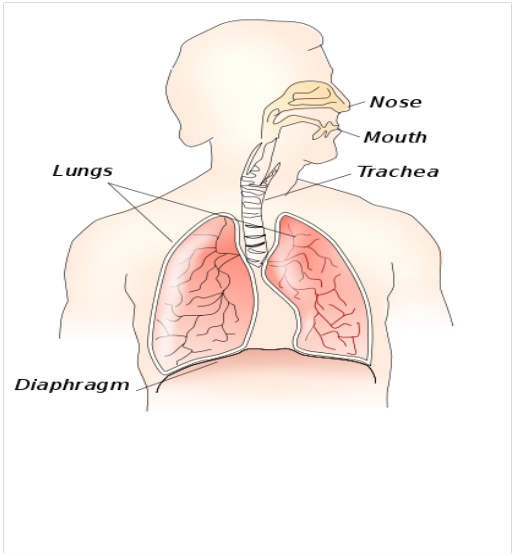
LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
18. Identify the structures of the lower airway	*Lower Airway Structures:* • Trachea • Bronchi (Bronchial Tree) • Bronchioles • Alveoli	• There is no consensus as to where the lower airway starts. Some state that it extends from the trachea to the alveoli and others belief that the larynx (above the vocal cords) is the beginning of the lower airway. • Another name for the carina is hilus. 
19. Discuss the characteristics of the trachea.	*Characteristics of the trachea:* • Lies anterior to the esophagus • Connects the pharynx to the lungs • Approximately 5 inches long in an adult and in children 1/3 the length of an adult • Anterior surface is composed of 16-20 ‘C’ shaped rings of cartilage • Posterior surface is composed of a muscular wall • Bifurcates at the carina (Hilus) into the right and left bronchi which lead into the right and left lung	• The rings of cartilage give support and keep the trachea from collapsing when air moves in and out. • The trachea divides into the right and left mainstem 

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
20. Discuss the characteristics of the bronchi.	*Characteristics of the bronchi:* • Bronchi divide further into smaller and smaller airways called bronchioles • Composed of ridged cartilage like the trachea • The angle of the left mainstem bronchus is <u>more</u> acute than the right mainstem bronchus • The right mainstem bronchus divides into 3 main branches • The left mainstem bronchus divides into 2 main branches	• The bronchi branch up to 22 to 26 times until they reach the terminal bronchioles. • Each main branch allows air to enter the different lobes of the lung. • The right bronchus has a greater chance for obstruction by a foreign body and bronchial intubation due to being shorter, wider and more vertical than the left. • Bronchioles are subject to collapse in some disease processes. And as they branch they lose their supporting cartilage and end up with more smooth muscle. 
20. Discuss the characteristics of the alveoli.	*Characteristics of the alveoli:* • Termination of the airway into grapelike clusters • There are about 700 million air sacs throughout both lungs • Each single layer air sac is wrapped in a web of thin-walled capillaries where oxygen (O_2) and carbon dioxide (CO_2) exchange takes place • Lined with surfactant - reduces surface tension - helps expand the alveoli - reduces the force needed to inflate the lungs - prevents alveolar collapse (atelectasis)	• In an adult the alveoli cover an area greater than the size of a tennis court (approximately 50-60 square meters) or 80 times the skin area. • The alveoli walls consist of single layer of epithelial tissue and elastic fibers. The fibers assist in the expansion and recoil during breathing. • Surfactant (surface-active agent) is a substance secreted by the Type II alveolar cells. • Surfactant is produced late in fetal life and premature infants may encounter respiratory distress or death if not treated promptly. • Each alveolus is surrounded by a network of capillaries. The alveoli and the vascular bed are separated by a fine membrane. **(Continued)**

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
		• The greater the distance of the alveoli from the capillary bed the more inadequate is the gas exchange (such as in emphysema). • Infants at birth have only 8% of the adult number of alveoli compared to adults that have approximately 300 million alveoli. Each alveolus is about 0.33 mm in diameter. • The greater the distance of the alveoli from the capillary bed the more inadequate is the gas 
A21 Describe the composition of the lungs.	*Composition of the lungs:* • Composed of elastic (parenchymal) tissue • Contains the bronchi, bronchioles, alveoli • Right lung has 3 lobes (upper, middle and lower lobes) • Left lung has 2 lobes (upper and lower lobes) • Covered by the visceral pleura	 • The lungs are capable of holding a total volume of 5,800 mL (6 Liters) of air.

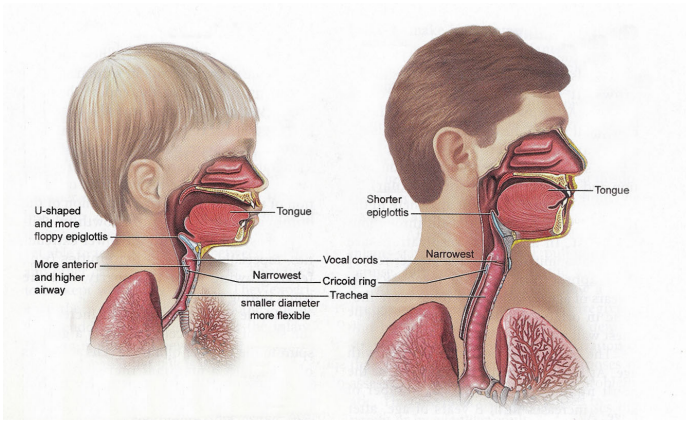
LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
22. Discuss the pulmonary lung volumes and give the capacity: A. Tidal Volume (V_t) B. Inspiratory reserve volume (IRV) C. Expiratory reserve volume (ERV) D. Residual volume (RV)	*Pulmonary lung volumes:* A. Tidal Volume (V_t) – amount of air inhaled or exhaled during a normal breath • Capacity 500mL B. Inspiratory reserve volume (IRV) – additional amount of air inhaled after normal tidal volume is reached • Capacity – additional 3000mL C. Expiratory reserve volume (ERV) – additional amount of air exhaled after normal tidal volume is expelled • Capacity – additional 1100mL D. Residual volume (RV) – amount of air that remains in the lungs after maximal exhalation • Capacity – 1200mL	• In times of psychological stress an individual may increase the amount of air they can inhale (IRV) and exhale (ERV). • The reserve volume prevents the medical condition were the lungs are not fully inflated (atelectasis) by keeping the alveoli slightly inflated.
23. Define the following: A. Visceral pleura B. Parietal pleura C. Pleural space	*Definition of the visceral and parietal pleura and the pleural space:* A. Visceral pleura is a thin, slippery outer lining that adheres tightly to the lung surface B. Parietal pleura is the thicker, more elastic layer that adheres tightly to the inner portion of the chest wall C. Pleural space is the negative pressure space between the visceral and parietal pleura and contains a small amount of serous fluid	• Each lung is enclosed within its own pleural cavity. • The visceral and parietal pleura are separated by a thin layer of serous fluid (less than 5 mL). The surface tension caused by the fluid results in the 2 layers sticking together. - When the chest wall moves it takes the parietal pleura along causing the visceral pleura to follow thus expanding the lung. • The serous fluid lubricates and reduces friction when the two surfaces rub against each other. This permits smooth movement of the lungs within the chest when breathing and prevents damage to the delicate lung tissue. • When inflammation or scarring from disease or injury occurs between the pleura, the patient may experience increased pleuritic chest pain when breathing. The parietal pleura is sensitive to pain and the visceral pleura is not. • The space between the 2 layers can fill with fluid (infection called pleurisy or pleuritis), air (pneumothorax) or blood (hemothorax).

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
24 Describe the structures of the thorax.	*Structures of the thorax:* • Ribs - 24 ribs arranged into 12 pairs - attached posteriorly by ligaments to the 12 thoracic vertebrae - 10 pairs are attached anteriorly by cartilage to the middle segment of the sternum • Sternum - a flat narrow bone in the middle of the anterior chest - clavicles and the first pair of costal cartilages are attached to the manubrium - ribs are attached to the middle segment of the sternum	• The 1st 7 pairs of ribs are attached to the sternum and called the *true ribs*. • The last 5 pairs of ribs are called *false ribs*. • The 8th, 9th and 10th pairs are attached to the ribs above them. • The front ends of the last 2 pairs of ribs are not attached to the sternum and are called "floating ribs". • The manubrium is the upper segment of the sternum. • The xiphoid process is the inferior portion of the sternum.
25. Discuss the location, characteristics and function of the respiratory muscles. A. Diaphragm B. External Intercostals **(Continued)**	*Location, characteristics and function of the respiratory muscles:* A. Diaphragm – principal muscle of respiration • Dome shaped muscle that extends across the bottom of the rib cage • Attached anteriorly to the costal arch and posteriorly to the lumbar vertebrae • Divides the thorax from the abdomen • Has both voluntary and involuntary muscle • Receives impulses from the phrenic nerve to contract which elongates the chest cavity resulting in a vacuum allowing air to enter the lungs • When it relaxes it rises in the chest, decreasing the size of the thoracic cavity, resulting in positive pressure in the lungs and exhalation B. External Intercostals – aid the diaphragm in increasing the size of the thoracic cavity • Located between ribs 1-11 and their insertion is located on ribs 2-12 on the lower margin of each rib and inserted on the upper margin of the next rib **(Continued)**	• The rhythmic contraction and relaxation of the muscles of respirations result in ventilation. • Inhalation is an active process in ventilation since energy is needed to contract muscles. • The diaphragm is responsible for at least 60-70% of effort needed to breathe. • The increase in the chest cavity results in negative pressure which draws air into the lungs (inspiration). This is caused by the diaphragm constricting and moving downwards to the level of the umbilicus and the contraction of the external intercostals muscles. • The intercostal muscles are responsible for the other 30-40% of effort needed to breathe. • Exhalation is a passive process; there is no expenditure of energy needed for relaxation of the diaphragm and intercostal muscles. • Exhalation becomes an active process when air is forced out of the lungs such as in asthma or emphysema. **(Continued)**

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
C. Internal Intercostals	• Receives impulses from the intercostal nerves to contract • Pull the ribs and sternum upward and outward to increase the volume of the chest cavity C. <u>Internal Intercostals</u> • Located between ribs 2-12 with their insertions located on ribs 1-11 • Innervated by the intercostal nerves • Responsible for depression of the ribs and decreasing the size of the chest cavity resulting in positive pressure in the lungs and exhalation • Aid in forced expiration	• Exhalation is a passive process; there is no expenditure of energy needed for relaxation of the diaphragm and intercostal muscles. • Exhalation becomes an active process when air is forced out of the lungs such as in asthma or emphysema. • The muscle fibers of the external and internal intercostal muscles run in opposite directions.  ☠ *When muscles stop contracting, breathing stops.* ☠ *A stab wound to the abdomen may result in a pneumothorax if the person was inhaling at the time of being stabbed.*

DIFFERENCES IN PEDIATRIC ANATOMY

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
27. Identify the structures that are different in the child vs. the adult.	*Structures different in the child vs. the adult:* • Nose • Mouth • Tongue • Neck • Epiglottis • Larynx • Cricoid cartilage • Trachea • Diaphragm • Ribs/chest	*Figure 26: Pediatric Airway* Anatomy of pediatric airway



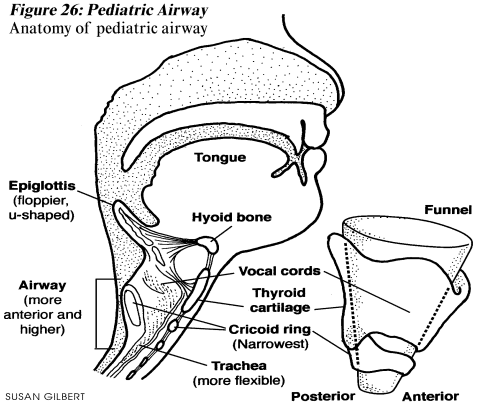
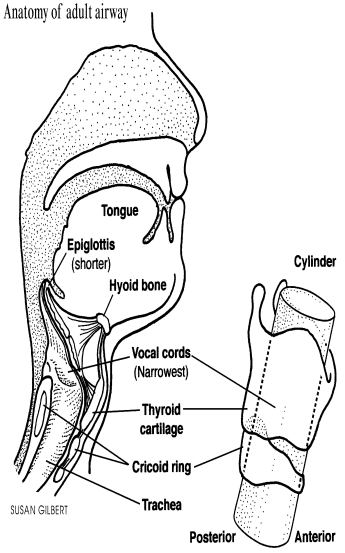


Figure 27: Adult Airway
Anatomy of adult airway



American Academy of Pediatrics, PEPP Second Edition

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
28. Compare the differences in the following airway structures for infants and children vs. adults:	• *Difference in the anatomy of the airway structures for infants and children vs. adults:*	
A. Nose and mouth	A. <u>Nose and mouth</u> • Smaller in an adult in proportion to body size • Primarily nose breathers	A. <u>Nose and mouth</u> • Can easily become obstructed even by small objects, vomitus and exudate. • Infants (2-3 months) are obligate nose breathers.
B. Tongue	B. <u>Tongue</u> – larger in comparison to the lower jaw	B. <u>Tongue</u> • Takes up considerably more space in the mouth and can block the pharynx more easily.
C. Neck	C. <u>Neck</u> – shorter, less developed muscles	C. <u>Neck</u> • Higher incidence of aspiration if neck is hyperextended. • The head of infants/young children are larger in proportion to their body size and need padding placed underneath the torso when in supine position to ensure an open airway. • Heads are proportionally larger in proportion to body size than adults. Adult dimensions are reached by 10-years-of-age.
D. Epiglottis	D. <u>Epiglottis</u> • Rounder and floppier • More U shaped • Larger than in an adult • Higher in the airway	D. <u>Epiglottis</u> • In the infant the epiglottis can pass behind the soft palate and lock into the nasopharynx creating 2 separate channels – 1 for air and 1 for food. This is why they can breathe and eat at the same time.
E. Larynx	E. <u>Larynx</u> • More anterior and superior • Cone shaped • Softer, more pliable	E. <u>Larynx</u> • The larynx in infants is located between C1 – C4. • The larynx in a 7-years-old is located between C3 – C5 resulting in the epiglottis no longer connecting with the soft palate which closes off the 2 separate channels in the infant. • The larynx in adults is located between C4 – C7.
F. Cricoid Cartilage	F. <u>Cricoid Cartilage</u> • Narrowest portion of the pediatric upper airway • Less developed and less rigid	F. <u>Cricoid Cartilage</u> • Foreign body obstructions occur mostly at this portion of the airway.
(Continued)	**(Continued)**	**(Continued)**

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
G. Trachea	G. Trachea • Narrower • Softer and more flexible • Abundant secretions	G. Trachea • Diameter in newborn is 4-5mm and in the adult it is 20mm. • Can easily be occluded if neck is hyperextended or hyper flexed. Due to the trachea being so small a significant increase in the resistance to airflow occurs due to swelling or a foreign body. • Due to the trachea being so small a significant increase in the resistance to airflow occurs due to swelling or a foreign body.
H. Diaphragm	H. Diaphragm – plays a larger part in breathing than intercostal muscles	H. Diaphragm • Children primarily use the diaphragm to breathe. • The intercostal muscles are used secondarily when increases assistance is needed.
I. Ribs/Chest	I. Ribs/Chest • Softer and more flexible • Intercostal muscles act like accessory muscles • Ribs are more horizontal and the ribcage is more rounded than in adults	I. Ribs/Chest • Greater movement when being ventilated due to chest being more pliable. • The intercostal muscles may fail to support the lungs when demands are increased. • Caution is required not to over inflate the lungs.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

Airway Management

RESPIRATORY SYSTEM PHYSIOLOGY

Upon completion of this unit of instruction, the student will be able to:

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
1. Describe the functions of the following: A. Upper Airway B. Lower Airway	*Functions:* A. Upper Airway • Warms inhaled air- mucous membranes, sinuses • Filters inhaled air- nose hairs, mucous membranes • Humidifies inhaled air- mucous membranes, sinuses B. Lower Airway • Exchange of oxygen and carbon dioxide • Filtration by cilia and mucous membranes	
2. Define gag reflex and describe its purpose.	*Definition and purpose of gag reflex:* • Definition - spastic pharyngeal and esophageal reflex from stimulus of the posterior pharynx • Protects the lower airway from aspiration of foreign material	
3. Define ventilation.	*Definition of ventilation:* • Movement of air into and out of the lungs	
4. Describe the physiology of ventilation for the following: A. Inhalation (active)	*Physiology of ventilation:* A. Inhalation (active) –diaphragm and intercostal muscles contract, increasing the size of the thoracic cavity allowing air to flow into the lungs.	A. Inhalation (active) • Diaphragm moves slightly downward and flares lower portion of the rib cage • Chest wall moves upward and outward increasing the size of the chest cavity. • The negative pressure created by the increased chest cavity draws air into the lungs until the pressure inside the lungs is equal to the atmospheric pressure outside the body.

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
4. Describe the physiology of ventilation for the following: (Continued) B. Exhalation (passive)	*Physiology of ventilation (Continued)* B. Exhalation (passive) – diaphragm and intercostal muscles relax, decreasing the size of the thoracic cavity allowing air to flow out of the lungs.	B. Exhalation (passive) • Diaphragm moves upward and the chest wall moves downward and inward to the normal resting position. • Decreasing the chest cavity size results in positive pressure that forces air out of the lungs. • Ventilation (act of breathing) is similar to the effect of bellows.
5. Define respirations.	*Definition of respiration:* • Respiration – exchange of gases between a living organism and its environment. • Major gases of respiration are oxygen (O_2) and carbon dioxide (CO_2)	• Ventilation is the mechanical process that moves air into and out of the lungs. • Respiration is the process of gas exchange in the lungs and peripheral tissues.
6. Describe the physiology of respiration: A. External Respiration (pulmonary) B. Internal Respiration (cellular) .	*Physiology of respiration:* A. External Respiration (pulmonary) – exchange of gases between the lungs and blood cells (capillary/cellular exchange) • Pulmonary perfusion – diffusion of gases across an alveolar-capillary membrane B. Internal Respiration (cellular) – exchange of gases between blood cells and tissue	• Diffusion – passage of gases from area of higher concentration to lower concentration. • O_2 and CO_2 dissolve in water and pass through alveolar membrane by diffusion. • Pulmonary perfusion: - Oxygen-rich air enters the alveoli during each respiration - Oxygen-poor blood from the pulmonary arteries passes into the alveolar capillaries. - Oxygen enters the capillaries as carbon dioxide enters the alveoli. • Internal respiration - Cells give up carbon dioxide to capillaries. - Capillaries give up oxygen to the cells.
7. Define normal respiratory rates for adults, children and infants	*Normal respiratory rates*: • Adult 12-20/minute • Child 18-40/minute (age dependent) • Infant 30-60/minute • 0-6 months 40-60/minute • ***If the rate is near the maximum, the child should be reassessed.*** *** *Normal ranges vary between various sources*	• Pediatric respiratory rates vary depending on the age and size of the child and various circumstances: - Infant 30-60/minute - Toddler 24-40/minute - Preschool 22-34/minute - School-aged 18-30/minute - Adolescent 12-16/minute • More than 1 factor is involved in respiratory insufficiency.

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
8. List the signs of adequate ventilation.	*Signs of adequate ventilation:* • <u>Rate</u> - within normal range • <u>Rhythm</u> - regular is a consistent rise and fall of the chest over an extended period of time - irregular is an inconsistent rise and fall of the chest, may have periods of apnea • <u>Quality</u> - equal and clear breath sounds - good air movement from mouth/nose - adequate and equal chest expansion - minimum effort • <u>Depth</u> - normal tidal volume	• Tidal volume (V_T) – amount of air inspired in each breath. Average adult male = 500ml (5-7ml/kg) Pediatrics = variable depending on age but still (5-7ml/kg) • Minimum effort may include accessory muscle use in infants and children
9. List the concentration of gases in the: A. Atmosphere B. Alveoli	*Concentration of atmospheric and alveolar gases:* A. <u>Atmosphere</u> • Nitrogen = 79% • Oxygen = 21% • Carbon Dioxide = < 1% • Water = < 1% B. <u>Alveoli</u> • Nitrogen = 75% • Oxygen = 14% • Carbon Dioxide = 5% • Water = 6%	• Nitrogen helps to keep air sacks open.
10. Discuss the following: A. Oxygen concentration in blood	*Oxygen concentration, saturation and transport:* A. <u>Oxygen concentration in blood</u> • Approximately 97% of total oxygen is bound to hemoglobin • Very little oxygen is dissolved in plasma	• PaO_2 is the symbol for *partial pressure of oxygen in arterial blood* – measures the oxygen concentration in arterial blood • PaO2 can only be measured by arterial blood gas analysis. • Dissolved oxygen crosses pulmonary capillary membrane and binds to the hemoglobin (Hgb) of red blood cell

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
10. Discuss the following: (Continued) B. Oxygen saturation	*Oxygen concentration, saturation and transport:* B. <u>Oxygen saturation</u> • Oxygen saturation is normally 94-100% on room air ******Oxygen should never be withheld if a patient has signs of respiratory distress.***	• SaO_2 is the symbol for the percentage of *oxygen saturation of arterial blood* – measures the amount of oxygen in the blood bound to hemoglobin. • Pulse oximetry measures the percentage of molecules bound to hemoglobin, not necessarily O_2 concentration (SaO_2) as in carbon monoxide poisoning. ***"Pulse oximetry may provide a false sense of security, even as CO2 levels rise to dangerous levels."*** – Baruch Krauss, M.D.
11. List the conditions that decrease oxygen concentration in the blood.	*Conditions that decrease oxygen concentration in the blood:* • Decreased hemoglobin levels • Inadequate alveolar ventilation • Decreased perfusion across the pulmonary membrane • Ventilation/perfusion mismatch	*Samples of conditions that decrease oxygen concentration in the blood:* • <u>Decreased hemoglobin concentration</u>: - anemia - hemorrhage • <u>Inadequate alveolar ventilation</u>: - low inspired oxygen - respiratory muscle paralysis - pulmonary conditions such as emphysema, asthma or pneumothorax • <u>Decreased perfusion across the pulmonary membrane</u>: - pulmonary edema - pulmonary contusion - aspiration - pneumonia - submersion emergency (near drowning) - COPD • <u>Causes of Ventilation/perfusion mismatch:</u> - portions of the alveoli collapse due to atelectasis or shunting (no gas exchange) which may be caused by hypoventilation secondary to pain or traumatic asphyxia - lung collapse caused by pneumothorax or hemothorax - pulmonary embolism

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
12. Discuss the treatment for correcting oxygen disorders.	*Correcting oxygen disorders:* • Administer oxygen • Supplement ventilations • Administer medications to correct the underlying problem	• ***DO NOT withhold oxygen from any patient whose condition warrants it.*** • If signs of inadequate ventilation, oxygen should be administered by positive-pressure ventilation.
13. Discuss the concentration of carbon dioxide in the blood and how it is transported	*Concentration and transport of Carbon dioxide (CO_2) in the blood:* • Approximately 20% of CO_2 is bound to hemoglobin • Less than 7% of CO_2 is dissolved in plasma • Approximately 70% of CO_2 is transported in the blood as bicarbonate ion (HCO_3)	• $PaCO_2$ is the symbol for *partial pressure of carbon dioxide in arterial blood* – it measures the CO_2 concentration in the blood. • PaO2 can only be measured by arterial blood gas analysis. • CO_2 is a byproduct of cellular metabolism. • When O_2 diffuses across the alveoli membrane into the blood stream, CO_2 diffuses across into the alveoli.
14. List the factors that increase/decrease carbon dioxide concentration in the blood.	*Factors that increase/decrease carbon dioxide concentration in the blood:* • <u>Increases CO_2 concentration</u>: - fever - muscle exertion - shivering - metabolic process (normal, anaerobic, ketoacidosis) - respiratory depression (medical conditions, trauma, drugs) - airway obstruction - impairment of respiratory muscles - obstructive disease (asthma, bronchitis, emphysema) • <u>Decreases CO_2 concentration</u>: - hyperventilation - sleep	• Hyperventilation can be caused by increased respiratory rate, deeper respirations, or both.
15. Discuss the treatment for correcting carbon dioxide disorders (hypercarbia).	*Correcting carbon dioxide disorders (hypercarbia):* • Increase rate and volume of ventilations • Correct the underlying cause	• Hypercarbia (hypercapnia) is the term for too much CO_2 in the blood.

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
16. Discuss the following lung volumes during normal ventilation: A. Total lung volume (capacity) B. Tidal volume C. Minute volume D. Residual volume E. Forced expiratory volume (FEV)	*Lung volumes during normal ventilation:* A. Total lung volume (capacity) – total amount of air in the lung at end of maximal inspiration B. Tidal volume – volume of air inhaled or exhaled during a single respiratory cycle C. Minute volume – amount of air moved in and out of the lungs per minute D. Residual volume -- volume of air remaining in the lungs after maximal expiration E. Forced expiratory volume (FEV) – amount of air that can be maximally expired after maximum inspiration	A. Total lung volume (capacity) - approximately 6 liters (6,000ml) or 6 Liter) in the adult male. B. Tidal volume – 500ml-750ml C. Minute volume – Breaths/minute X Tidal volume = Minute volume (20 breaths/min X 500ml = 10,000ml) D. Residual volume – keeps air sacks open.
17. Define dead space and explain the following types: A. Anatomical dead space B. Physiological dead space C. Mechanical dead spaced	*Definition of dead space:* • Dead space is air remaining in the airway that is unavailable for gas exchange. A. Anatomical dead space – located in the trachea and bronchi and air passages that do not reach the alveoli B. Physiological dead space – formed by disease or obstruction (i.e. COPD, atelectasis) and the space in the alveoli that does not contribute to the oxygen-carbon dioxide exchange. C. Mechanical dead spaced – formed by introducing airway devices (i.e. ET tube)	• Not all inspired air enters the alveoli (i.e. tachypnea leads to increased dead space air. A. Anatomical dead space: • The amount of dead space generally depends on the weight of the patient. Each pound equals 1 ml of dead space. Therefore, for a patient who weighs 125 lbs it would be equal to approximately 125ml of dead space. B. Physiological dead space: • Diseases or obstruction that may hinder the oxygen-carbon dioxide exchange include COPD, asthma, atelectasis and pneumonia. C. Mechanical dead space: • May be increased by adding additional inhalation devices between the ET tube and the oxygen reservoir (i.e. devices to instill medications).
18. Define alveolar air.	*Definition of alveolar air:* • Alveolar air is the air available for gas exchange (approx. 350ml)	• Minor diffusion occurs in alveolar ducts and terminal bronchioles.

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
19. Discuss the following reserve volumes in the lungs: A. Functional reserve capacity (FRC) B. Inspiratory reserve volume (IRV) C. Expiratory reserve volume (ERV)	*Reserve volumes in the lungs:* A. Functional reserve capacity (FRC) – the amount of gas that remains in the lungs after normal expiration B. Inspiratory reserve (IRV) – amount of air that can be maximally inhaled after normal inspiration (addition to tidal volume) C. Expiratory reserve (ERV)– amount of air that can be maximally exhaled after normal expiration	• When reserve volumes are affected by disease states (i.e. emphysema, asthma). These patients can be assisted with continuous positive airway pressure (CPAP). • CPAP provides continuous airway pressure to keep the airways open and reduce the work of breathing.
20. Define peak expiratory flow.	*Peak expiratory flow:* • Peak expiratory flow is the maximum rate of volume change (flow rate) during forced expiration after maximal inspiration	• Peak expiratory flow is measured by using a flow meter to measure the degree of restriction in the airways. • Peak expiratory flow varies by age, size and lung condition. • Commonly used by asthmatics to assess and manage their condition. • Patients who measure their peak flow usually know when they need to go to the hospital for further evaluation and treatment.
21. Explain the relationship between pulmonary circulation and internal respiration.	*Relationship between pulmonary circulation and internal respiration:* • Pulmonary circulation and internal respiration is dependent on: - adequate O_2 in alveoli - alveolar capillary exchange - adequate tissue perfusion - capillary cellular exchange	• Internal respiration is the exchange of gases between blood cells and tissue. • Pulmonary circulation and internal respiration is dependent on ventilation, perfusion and diffusion. • The Fick Principle is used to determine cardiac output and the components necessary for the oxygenation of organs. It assumes that the amount of oxygen delivered to an organ is *equal* to the amount of oxygen consumed plus the amount of oxygen carried away from that organ. This involves: - ventilation - perfusion - diffusion

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
22. Describe how the body regulates respirations.	*Body's regulation of respirations:* • Respirations are controlled by both the voluntary and involuntary nervous system. • Primarily controlled by the medulla and pons that control the rate and depth of respirations: • The impulses for automatic breathing descend through the spinal cord and can be overridden by voluntary control.	• Medulla - primary involuntary respiratory center - controls the respiratory muscles via the vagus nerve • Pons - Apneustic center – is the secondary - control center if the medulla fails to initiate respirations - Pneumotaxic center – controls expiration
23. Explain how the following chemoreceptors control the stimulus to breath: A. Central chemoreceptors B. Peripheral chemoreceptors	*Chemoreceptors control the stimulus to breath:* A. Central chemoreceptors • Located near the respiratory center in the medulla • Sense CO_2 in the cerebrospinal fluid • High CO_2 will stimulate increased rate and depth of respirations B. Peripheral chemoreceptors • Located in carotid and aortic arteries • Respond mainly to O_2 levels in the blood • Low O_2 levels will stimulate increased rate and depth of respirations	• Healthy people breathe on a *hypercarbic* (high carbon dioxide) drive. • In patients with COPD, the carbon dioxide level is chronically elevated and the central chemoreceptors become insensitive to increased CO_2 levels. These individuals breathe on a *hypoxic* (low oxygen) drive. • Peripheral chemoreceptors are the "backup" system or "secondary" chemoreceptors to activate the breathing stimulus. Provide information for the *hypoxic* drive.
24. Define pH and give the normal blood value.	*Definition and value:* • pH is the percentage of hydrogen ion concentration in the blood. • Normal blood pH value is 7.35 – 7.45. ***oxygen uptake is better in a slightly acidic environment.* *** Alkalosis causes cerebral artery vaso-constriction which results in less oxygen to brain cells and increases cerebral swelling.*	• The acidity and alkalinity of the blood depends on the H^+ ion concentration. • Changes in pH are caused by either metabolic or respiratory changes. • *Increased* CO_2 levels result in the *decrease* of the pH value in the blood resulting in *acidosis* and stimulates the respiratory center to *increase* respirations and tidal volume. • D*ecreased* CO_2 levels *increase* the pH value in blood resulting in *alkalosis* and stimulates the respiratory center to *decrease* respirations and tidal volume. • The body is able to tolerate a state of acidosis better than alkalosis.

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
25. List the factors that affect respiratory rate and depth.	*Factors affecting respiratory rate and depth:* • Body temperature • Drugs and medications • Pain • Emotion • Hypoxia • Acidosis • Sleep	• Respirations may either increase or decrease due to a drug's action. • Respirations may increase due to pain, emotion or fever. • Respirations may increase to compensate for increased CO_2 levels or acidosis. • Respirations decrease to compensate for low CO_2 levels or in patients with COPD when there are high O_2 levels. • Respirations decrease with sleep.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

AIRWAY EMERGENCY / AIRWAY MANAGEMENT
SUCTIONING
OROPHARYNGEAL

PERFORMANCE OBJECTIVES
Demonstrate competency in performing oropharyngeal suctioning using a rigid, flexible suction catheter, and a bulb syringe.

CONDITION
Suction a simulated patient who is either conscious or unresponsive and is unable to maintain a patent airway due to copious oral secretions. The patient is currently on oxygen at 15L via a non-re-breather mask. Necessary equipment will be adjacent to the patient or brought to the field setting.

EQUIPMENT
Simulated adult and pediatric airway management manikin, oxygen tank with connecting tubing, non-suction device with connecting tubing, or hand-powered suction device with adaptor, hard and flexible suction catheters, bulb syringe, normal saline irrigation solution, container, non-sterile gloves, goggles, masks, gown, waste receptacle, timing device.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.
- A clean technique must be maintained throughout suctioning procedure.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions (BSI)	• Mandatory personal protective equipment - gloves, goggles • Situational - masks, gown • The application of gloves prevents contact between the EMT and the patient's body fluids. • Protected eyewear and mask are recommended since these fluids might scatter, or the patient may gag and cough, sending droplets to your face, eyes, and mouth.
♦ Assess the patient for the need to suction oral secretions	• The indications for suctioning include: noisy respirations, coughing up secretions, respiratory distress, or patient request.
♦ Open suction kit or individual supplies	• Use the inside of the wrapper to establish a clean field.
♦ Fill the sterile container with irrigation solution	• Saline or water is used to flush the suction catheter as needed.
♦ Ensure the suction device is working ** ***Set the appropriate suction setting:*** • ***Adult - between 80-120 mmHg*** • ***Pediatric and the elderly - between 50-100mmHg***	• A battery operated suction machine or hand-powered suction device may be used. An adaptor for a flexible catheter is required with a hand-powered suction device. • Excessive negative pressure may cause significant hypoxia, damage to tracheal mucosa or lung collapse.

RIGID CATHETER (TONSIL TIP, YANKAUER) PROCEDURE	
Skill Component	**Key Concepts**
♦ Remove the oxygen source - *if applied*	• Oxygen delivery should be maintained on the patient until you are ready to suction. • A nasal cannula does not need to be removed for oropharyngeal suctioning.

Skill Component	Key Concepts
♦ Connect a rigid catheter to suction tubing/device	• Keep the catheter in the package until you are ready to use it. • Provide a clean field for the catheter if you may need to use it again.
♦ Open the patient's mouth by applying pressure on the chin with the rescuer's thumb	• Applying thumb pressure on the chin displaces the jaw forward. **DO NOT** use fingers to open the mouth. The crossed-finger technique may result in injury to the rescuer and may puncture the gloves. • **DO NOT** force the teeth open. Use a flexible catheter if unable to open the mouth.
♦ Insert a rigid catheter into the patient's mouth without applying suction	• The patient is not being oxygenated during this step so applying suction could deplete any oxygen reserve the patient may have.
♦ Advance the catheter gently into the oral cavity	• Never insert the catheter past the base of the tongue. This may stimulate the gag reflex, cause vomiting, and bradycardia.
♦ Suction while withdrawing the catheter using a circular motion around the mouth, pharynx and gum line ** ***Maximum suction time of 5-15 seconds:*** • ***Adults maximum 10-15 seconds*** • ***Peds maximum of 5-10 seconds***	• Suctioning for longer than the recommended timeframe may result in hypoxia. The maximum suction time depends on patient's age and tolerance. • Rigid catheters are contraindicated in infants less than 1 year of age due to the incidence of bradycardia associated with their use.
♦ Replace the oxygen source or ventilate the patient at approximate rate of: • Adult – one (1) breath every 5-6 seconds or 10-12/min • Infants and Children – one (1) breath every 3-5 seconds or 12-20/min	• Follow the 2015 Emergency Cardiac Care (ECC) Guidelines for ventilation rates for adults, children, and infants,
♦Evaluate for the patency of the airway after suctioning ***Monitor the patient's pulse*** ‘	• The signs and symptoms of hypoxia are: dysrhythmias, cyanosis, anxiety, bronchospasms, and changes in mental status. • Suctioning the airway may cause stimulation of the vagus nerve. Stimulation of the vagus nerve causes bradycardia. This is especially true in pediatric patients. Therefore, monitor the patient's pulse after suctioning. • Allow patient to rest and regain adequate oxygen levels between suction attempts.
♦ Suction the remaining water into a canister, ***Discard the canister*** *** ***Change gloves***	
♦ Discard the contaminated catheter into : ***Discard into an approved receptacle*** **OR** ***Return the used catheter to package and place it in a clean area for future use***	• Provide a clean field for the catheter if you may need to reuse it

FLEXIBLE CATHETER (WHISTLE STOP, FRENCH) PROCEDURE	
Skill Component	**Key Concepts**
♦ Measure the depth of catheter insertion from corner of mouth to the edge of ear lobe	• Never insert the catheter past the base of the tongue. This may stimulate the gag reflex and cause vomiting.
♦ Remove the oxygen source - *if applied*	• Oxygen should be maintained until you are ready to suction. • A nasal cannula does not need to be removed for oropharyngeal suctioning.
♦ Connect the flexible catheter to suction tubing/device	• Keep catheter in package until ready to use. • Provide a clean field for catheter if reuse is indicated.
♦ Open the patient's mouth by applying pressure on the chin with your thumb	• Applying thumb pressure on the chin displaces the jaw forward. **DO NOT** use fingers to open the mouth. The crossed-finger technique may result in injury to the rescuer and may puncture gloves. • **DO NOT** force the teeth open. Use a flexible catheter if unable to open the mouth.
♦ Insert the flexible catheter along the roof of the mouth without applying suction	• The patient is not being oxygenated at this time and applying suction could deplete any oxygen reserve present.
♦ Advance the catheter gently to depth measured	• **NEVER** insert the catheter past the base for the tongue. This may stimulate the gag reflex, cause vomiting, and bradycardia.
♦ Suction while withdrawing the catheter moving it from side to side around mouth, pharynx and gum line ** ***Maximum suction time of 5-15 seconds:*** • ***Adults maximum 10-15 seconds*** • ***Children maximum of 5-10 seconds*** • ***Infants – Up to 5 seconds***	• Suctioning for longer than the recommended timeframe may result in hypoxia. The maximum suction time depends on patient's age and tolerance.
♦ Replace the oxygen source **OR** ventilate patient at approximate rate of: • Adult – one (1) breath every 5-6 seconds or 10-12/min • Infants and Children – one (1) breath every 3-5 seconds or 12-20/min	• The range for pediatric patients varies due to a wide age range. • Follow the 2015 Emergency Cardiac Care (ECC) Guidelines for ventilation rates for adults, children, and infants,
♦Evaluate for the patency of the airway after suctioning ****Monitor the patient's pulse*** ‘	• The signs and symptoms of hypoxemia are: dysrhythmias, cyanosis, anxiety, bronchospasm, and changes in mental status. • If vagal stimulation occurs, the patient may experience bradycardia, especially pediatric patients. • Allow patient to rest and regain adequate oxygen levels between suction attempts.
♦ Suction the remaining water into canister, discard container and change gloves	• Rinse solution is contaminated and should be treated the same as secretions.
♦ Discard the catheter into an approved receptacle: - Coil the contaminated catheter around (dominant) gloved hand and pull the glove over catheter - Pull the glove from other hand over packaged catheter and discard in approved waste receptacle **OR** • Return the used catheter to its package and place it in a clean area for future use	• Provide a clean field for the catheter if you may need to reuse it

BULB SYRINGE PROCEDURE	
Skill Component	**Key Concepts**
♦ Prime the bulb syringe by squeezing out the air and hold in depressed position	• The bulb syringe acts as both the pump and collection container for manual suction.
♦ Open the patient's mouth by applying pressure on the chin with your thumb	• Applying thumb pressure on the chin displaces the jaw forward. **DO NOT** use fingers to open the mouth. The crossed-finger technique may result in injury to the rescuer and may puncture gloves.
♦ Insert tip of primed syringe into mouth and advance gently to back of mouth	• **DO NOT** insert the tip past the base of the tongue. This may stimulate the gag reflex, cause vomiting and bradycardia.
♦ Release pressure on bulb slowly to draw secretions into syringe	
♦ Remove syringe from mouth	
♦ Empty secretions into designated container by squeezing bulb several times	• All secretions are to be treated as contaminated waste.
♦ Replace oxygen source or ventilate patient at approximate rate of: • Infants and Children – one (1) breath every 3-5 seconds or 12-20/min	• The rate for ventilating pediatric patients varies due to a large age range.
♦ Evaluate airway patency and heart rate - *repeat procedure if needed*	• The signs and symptoms of hypoxemia are: dysrhythmias, cyanosis, anxiety, bronchospasms, and changes in mental status. • If vagal stimulation occurs, the patient may experience bradycardia, especially pediatric patients. • Allow patient to rest and regain adequate oxygen levels between suction attempts.
♦ Rinse the bulb syringe with irrigation solution	• Rinsing the bulb syringe clears the secretions from the syringe which allows it to be prepared for additional suctioning. . The syringe can be flushed with Normal Saline or sterile water.
♦ Return the used bulb syringe to the package/container and place it in clean area for future use	
♦ Discard the contaminated irrigation solution into a designated container ***Change gloves*	• The irrigation solution is contaminated and should be treated the same as secretions. • If you suspect the patient is suffering from an infectious disease, discard in an infectious waste receptacle

RE-ASSESSMENT (Ongoing Assessment	
Skill Component	**Key Concepts**
♦ Re-assess the patient a minimum of every **15 minutes or sooner:** • Primary assessment • Relevant portion of the secondary assessment • Vital signs: BP, P and RR ***Manage patient condition as indicated.*	• If the patient is stable, the patient should be re-assessed at least every 15 minutes or sooner. Unstable patients must be re-evaluated at least every five (5) minutes or sooner. • Evaluating and comparing results assists with recognizing if the patient is improving, responding to treatment, or if their condition is deteriorating.

PATIENT REPORT AND DOCUMENTATION	
Skill Component	**Key Concepts**
§ Verbalize/Document • Indication for suctioning • Oxygen liter flow • Patient's tolerance of procedure • Problems encountered • Type of secretions: - color - consistency - quantity - odor • Respiratory assessment and heart rate: - respiratory rate - effort/quality - tidal volume - lung sounds	• Documentation must be on either the Los Angeles County EMS Report form or departmental Patient Care Record form, or ePCR.

Developed: 12/02 Revised: 11/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

AIRWAY EMERGENCY / AIRWAY MANAGEMENT
SUCTIONING - OROPHARYNGEAL
Supplemental Information

INDICATIONS: To clear the airway in patients who are unable to maintain a patent airway due to oral secretions.

- Excessive oral secretions (noisy respirations)
- Respiratory distress due to oral secretions/vomitus
- Prevent aspiration of secretions/vomitus

COMPLICATIONS:

- Hypoxia
- Bronchospasm
- Cardiac dysrhythmias
- Hypotension
- Oral trauma/broken teeth
- Infection/sepsis
- Vomiting
- Aspiration

CONTRAINDICATION:

- Infants less than 1 year of age – use bulb syringe

NOTES:

- A clean technique must be maintained throughout suctioning procedure to prevent infection.
- Use rigid catheters with caution in conscious or semiconscious patients. Put the tip of the catheter in only as far as can be visualized to prevent activating the gag reflex.
- Rigid catheters are best for suctioning large amount of secretions or large particles.
- Hand-powered suction devices may be used as long as they have an adaptor for a flexible catheter.
- Pre-oxygenation may be required depending on patient's condition. This offsets volume and oxygen loss during suctioning.

PEDIATRIC CONSIDERATIONS:

- Suctioning a pediatric patient requires taking the following factors into consideration
  - The nose and mouth of infants and children are smaller and more easily obstructed.
  - The tongue takes up more space proportionately in the mouth than in adults.
  - The trachea is softer and more flexible.
  - The trachea is narrower and is more likely to become obstructed.
  - The chest wall is softer, and infants and children depend more than their diaphragm for breathing.
  - Open the airway gently. The infant's head should be placed in a neutral position and children only require slight neck extension. **DO NOT** hyperextend the neck because it may cause the trachea to collapse.
  - Consider the use of an OP or NP airway when other measures fail to keep the airway open.
  - A rigid tip catheter is contraindicated in infants < 12 months of age. If > 12 months, use a rigid tip suction catheter is permitted if the back of the oropharyngeal airway **IS NOT TOUCHED.**

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

AIRWAY EMERGENCY / AIRWAY MANAGEMENT
SUCTIONING - TRACHEOSTOMY TUBE AND STOMA

PERFORMANCE OBJECTIVES
Demonstrate competency in suctioning a patient with a tracheostomy tube while maintaining aseptic technique.

CONDITION
Suction a simulated patient that who has a tracheostomy tube/stoma and has copious secretions and difficulty breathing. Necessary equipment will be adjacent to the manikin or brought to the field setting.

EQUIPMENT
Simulated adult or pediatric tracheostomy manikin, tracheostomy tube (metal/plastic) with an inner cannula, oxygen tank with connecting tubing, T-bar or tracheal mask, suction device with connecting tubing or hand-powered suction device with adaptor, sterile flexible suction catheter, sterile saline irrigation solution, sterile container, sterile saline irrigation vial/ampule and 5cc syringe with removable needle or saline squeeze ampule, pediatric resuscitation, sterile and unsterile gloves, goggles, masks, gown, waste receptacle, timing device.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) should be practiced.
- Ventilations must be at least at the minimum rate required.
- Must maintain aseptic technique.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions	• Mandatory personal protective equipment – mask, gown, sterile gloves
♦ Assess the patient for the need to suction tracheal secretions	• Indications for suctioning: noisy breathing, coughing, copious secretions, respiratory distress, decreased oxygen saturation level, tachypnea, bradypnea, or patient request.
♦ Ensure the tracheostomy ties are secure	• If ties are not secure, the patient may cough out the tracheostomy tube when suction catheter is inserted or suction is applied.
♦ Ensure suction device is working	• Hand-powered suction devices may be used as long as they have an adaptor for a flexible catheter. • Excessive negative pressures may cause significant hypoxia, damage to tracheal mucosa or lung collapse.
♦ Open suction kit or individual supplies	• Establish and maintain a sterile field. Use the inside of the wrapper of the suction kit or use a sterile towel to establish a sterile field. • Catheter size should not exceed ½ the inner diameter of the airway.
♦ Open/unfold the sterile container and fill with irrigation solution	• Sterile saline is used to flush suction catheter as needed. • Depending on kit, container may be under gloves and catheter; this should be removed without contaminating gloves and catheter.
♦ Sets the appropriate suction setting: *****For the adult patient:* 80-120 mmHg*** *****For Peds and Elderly:* Peds/Elderly 50-100mmHg***	

PROCEDURE	
Skill Component	**Key Concepts**
♦ Measure the suction catheter **Measures against the length of the inner cannula or spare tracheostomy tube	• Patients with tracheostomy tubes usually have spare tubes or inner cannulas in their home.
♦ Pre-oxygenate patient - *if indicated*: • Increase oxygen liter flow to 15 Liters/minute for several breaths – if on oxygen **OR** • Ventilate with Bag-Mask-Ventilation (BMV) device 4-5 times	• Pre-oxygenation may be required in patients dependent on O_2 source or if ventilator dependent to offset volume or oxygen loss during suctioning. • Emergent suctioning does not allow time for pre-oxygenation.
♦ Remove oxygen source - *if applied*	• Patient may or may not be on oxygen and have either a T-bar or tracheal mask for humidification. • Oxygen should be maintained until ready to suction. Flow rate may need to be adjusted to prepare patient for suctioning.
♦ Unlock and remove inner cannula - *if the device has an inner cannula*	• Not all trach tubes have inner cannulas. • Sometimes just removing the inner cannula corrects the problem. The cannula may only need to be cleaned and replaced. • The inner cannula does not need to be removed for routine suctioning. However, if the patient is in respiratory distress the inner cannula must be removed in order to avoid pushing thick secretions down the trachea. • The 15mm adaptor that attaches to the BVM device on some trach tubes may be connected to the inner cannula.
♦ Don sterile gloves - *if indicated:* • If the tracheostomy tube is new (inserted within 4-6 weeks). **OR** • The patient is immunocompromised	• Tracheal tube suctioning is generally a clean procedure. However, if the tracheostomy tube has just been inserted within 4-6 weeks, or the patient is immunocompromised. Sterile technique should be used. • The following patients may be Immunocompromised: o Cancer patients undergoing chemotherapy o Patient's being treated for rheumatoid arthritis o Patients being treated for Crones disease • Sterile gloves should be applied over existing clean gloves.
♦ Connect the sterile catheter to the suction tubing/device ** ***Keep the dominant hand sterile – if wearing sterile gloves***	• If sterile technique is required, the suction catheter should only be handled with sterile gloves. • Keep the catheter in the sterile package until it is ready to be used. • Catheter size should be smaller than the inner diameter of the trach tube to allow for ease of insertion and air to enter during suctioning.
♦ Suction a small amount of irrigation solution to lubricate the tip of the catheter	• Lubricating the tip of the catheter with irrigation solution prevents the catheter from adhering to the sides of the trach tube or tracheal mucosa.
♦ Insert the catheter into the tracheostomy tube/stoma **without applying suction**	• The patient is not being oxygenated at this time and applying suction may deplete oxygen reserves. • If patient has a stoma, suctioning during insertion may damage the lining of the tracheal mucosa.

Skill Component	Key Concepts
♦ Advance the catheter gently to appropriate level: ***<u>For a tracheostomy tube</u>: Advances the suction catheter to the measured length of the suction catheter into the tracheostomy tube*** ***<u>For a stoma:</u> Advances the suction catheter approximately three (3) to four (4) inches into the stoma in the adult patient***	• Ideally, the suction catheter should be measured against a tracheostomy tube. A tracheostomy tube length is app • Shallow/measured suctioning may be all that is needed. Deep suctioning is usually not necessary unless cough is ineffective and airway is not cleared. • Deep suctioning is at the level of the carina which is determined by the catheter meeting resistance during insertion. • The patient may cough or develop bronchospasms when the tip of catheter touches the carina. • Catheter insertion should be accomplished as rapidly as possible since the patient is not oxygenated during this step.
♦ Suction while withdrawing the catheter using a rotating motion and observe patient's response: ** ***Maximum suction time :*** • ***Adults - maximum 10 seconds*** • ***Children – no longer than 5-10 seconds*** • ***Infants - no longer than 3-5 seconds*** • ***Neonates – no longer than 3 seconds***	• Rotating the catheter prevents the direct suctioning of the tracheal mucosa and suctions secretions from side of the tube. - Roll the catheter between thumb and forefinger for rotating motion. • Suctioning longer than recommended time may result in hypoxia and possibly bradycardia. Maximum suction time depends on patient's age and tolerance. • Patient's response by coughing or grimacing may indicate the catheter is too deep and irritating the tracheal mucosa or carina. May also increase intracranial pressure, tachycardia, and hypertension.
♦ Replace the oxygen source ***Deliver positive pressure ventilations - if indicated***	• Patients may need supplemental oxygen after suctioning. • If the patient is ventilator dependent, ventilate the patient with a bag-mask device in between suction attempts.
♦ Evaluate airway patency and heart rate – ***Repeat the procedure if needed***	• Observe patient for hypoxemia, dysrhythmias, cyanosis, anxiety, bronchospasms, and changes in mental status. • If vagal stimulation occurs, the patient may experience bradycardia, especially pediatric and elderly patients. • Allow patient to rest and regain adequate oxygen levels between suctioning attempts.
♦ Suction the remaining irrigation solution into a ~~collection~~ canister and discard appropriately	• Remaining irrigation solution is contaminated and should be treated the same as secretions.
♦ Discard the contaminated catheter • Coil the contaminated catheter around a gloved hand and pull the glove over the catheter • Pull glove from other hand over packaged catheter and discard in approved waste receptacle	• Avoid coming skin contact with the contaminated catheter. If this occurs, wash the area immediately with soap and water.
♦ Don a clean set of gloves	

REPLACE INNER CANNULA

Skill Component	Key Concepts
♦ Check for a clean spare inner cannula spare **If there is **NOT** a clean spare inner cannula, rinse the inner cannula with sterile water or normal saline- *<u>if needed</u>*	• Most patients have a spare inner cannula at their bedside. • If the inner cannula needs to be cleaned, this can be done by the rescuer, caregiver, or partner. • Procedure for cleaning the inner cannula: - rinse the inner cannula with saline - suction or use a pipe cleaner to remove secretions - gently tap the cannula to remove excess solution before reinsertion
♦ Remove the oxygen source – *if applied*	
♦ Replace and lock clean inner cannula in place	

RE-ASSESSMENT (Ongoing Assessment)	
Skill Component	**Key Concepts**
§ Re-assess the patient least every 5-15 minutes for: • Changes in airway sounds or gurgling • Changes in respiratory status • Vital signs: Blood pressure, pulse, and respirations ***Manage patient's condition as indicated.**	• Evaluating and comparing the results from a prior assessment assists in recognizing if the patient is improving, deteriorating, or responding to treatment.

PATIENT REPORT AND DOCUMENTATION	
Skill Component	**Key Concepts**
§ Verbalize/Document • Indication for suctioning • Oxygen liter flow – *if applied* • Patient's tolerance of procedure • Any problems encountered • Secretions: - color - consistency - quantity - odor • Respiratory assessment and heart rate: - respiratory rate - effort/quality - tidal volume - lung sounds	• Documentation must be on either the Los Angeles County EMS Report form, departmental Patient Care Record form, or ePCR. • Documenting reassessment information provides a comprehensive picture of patient's response to treatment.

Developed: 10/02 Revised: 11/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

AIRWAY EMERGENCY / AIRWAY MANAGEMENT
SUCTIONING - TRACHEOSTOMY TUBE AND STOMA
Supplemental Information

DEFINITIONS:

- Inner cannula – A tube that fits inside the tracheostomy tube. It may be removed for cleaning
- Pre-oxygenation - increasing oxygen liter flow for a brief period or ventilating the patient 3-4 times with a bag-valve device to increase the blood oxygen level
- Tracheotomy - a surgical incision into the trachea to establish an airway that may be temporary or permanent
- Tracheostomy - a tracheal stoma (opening) that results from a tracheotomy
- Tracheostomy tube - a plastic or metal tube inserted below the 2nd or 3rd tracheal ring bypassing the epiglottis

INDICATIONS: To maintain a patent airway in patients with a tracheostomy tube or stoma.

- Gurgling mucus sound from tracheostomy (noisy respirations)
- Bubbles of mucus in trach
- Coughing up secretions
- Patient requests to be suctioned
- Respiratory distress due to airway obstruction.

COMPLICATIONS:

- Hypoxia
- Bronchospasms
- Tracheal trauma
- Infection/sepsis
- Cardiac irritation (dysrhythmias) due to decreased myocardial oxygenation
- Tachycardia, hypertension, intracranial pressure due to coughing and gagging
- Bradycardia and hypotension due to vagal stimulation
- Cardiac arrest

NOTES:

- Pre-oxygenation may be required depending on patient's condition. This offsets volume and oxygen loss during suctioning.
- Patient may or may not be on oxygen and have either a T-bar or tracheal mask for humidification.
- Oxygen should be maintained until ready to suction – if it has been applied.

Inner Cannulas:

- Sometimes just removing the inner cannula corrects the problem. The cannula may only need to be cleaned and replaced.
- The inner cannula does not need to be removed for routine suctioning. However, if the patient is in respiratory distress the inner cannula must be removed in order not to push the thick secretions back down the trachea and to open the airway immediately.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

AIRWAY EMERGENCY / AIRWAY MANAGEMENT
OROPHARYNGEAL AIRWAY (OPA)

PERFORMANCE OBJECTIVES
Demonstrate competency in sizing, inserting and removing an oropharyngeal airway.

CONDITION
Insert an oropharyngeal airway in a simulated unconscious adult, child, or infant who is breathing, has no gag reflex, but has difficulty maintaining a patent airway. Necessary equipment will be adjacent to the manikin or brought to the field setting.

EQUIPMENT
Adult, infant or child airway manikin, various sizes of oropharyngeal airways (0-#6), tongue blade or equivalent, pediatric resuscitation tape, goggles, mask, gown, gloves, airway bag.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.

INSERTION OF OPA PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions	• Mandatory personal protective equipment – gloves at all times • Situational - goggles, masks, gown as needed
♦ State the indications for insertion of an oropharyngeal airway (OPA). • Unresponsive patient without a gag reflex • Unresponsive apneic patient being ventilated with a bag-mask-device (BMV)	• The use of an OPA is a safe and effective way to maintain the airway in a patient who requires spinal motion restriction (SMR). • The use of an OPA with a trauma patient may make SMR easier to maintain.
♦ State the contraindications for insertion of an OPA. • Conscious or semi-conscious patient • Any conscious or unresponsive patient with a gag reflex • Clenched teeth • Oral trauma	• A gag reflex is a protective mechanism that prevents objects from entering the airway. • Insertion of an OPA may stimulate a gag reflex in the patient. If this occurs, the OPA must be removed immediately.
♦ Select appropriate size by measuring the OPA from : • Corner of the mouth to the tragus or the earlobe **OR** • Center of the mouth to the angle of the lower jaw	• The tragus is the small pointed prominence of the external ear that is situated in front of the ear canal. • A measurement must be taken before choosing the appropriate size. If the fit is not perfect, choose the smaller one. OPA's that are too large may cause an airway obstruction. • If the size is not located on the OPA, document as infant, small, medium, or large. • If the OPA airway is too small it will not hold the tongue forward. • An OPA that is too long can press the epiglottis against the opening of the trachea and result in an airway obstruction.

INSERTION OF THE OPA PROCEDURE	
Skill Component	**Key Concepts**
♦ Open the mouth by applying pressure on the chin with thumb ** **Remove visible obstruction or suction - *<u>if indicated</u>***	• Applying thumb pressure on the chin displaces the jaw forward. **DO NOT** use fingers to open the mouth. The crossed-finger technique may result in an injury to the rescuer and may puncture gloves. (However, the crossed-finger method is a step found on the National Registry Skills Exam.) • **DO NOT** force the teeth open. Insert a nasopharyngeal airway (NPA) if unable to open the mouth. • Have suction ready at all times and use as indicated.

Skill Component	Key Concepts
♦ Insert the OPA airway into the oropharynx by inserting the tip: • Toward the hard palate and rotate 180^{O} when tip passes the soft palate **OR** • Straight while displacing the tongue anteriorly with a tongue blade or equivalent device **OR** • Sideways while displacing the tongue anteriorly with a tongue blade or equivalent device and rotate OPA 90^{O} when tip passes the soft palate	• Avoid placing pressure on the palate to prevent injury. • **DO NOT** push the tongue back into the oropharynx. This will result in an airway obstruction. • Displacing the tongue anteriorly is the recommended method for inserting an OPA in a pediatric patient. ***This is the only method that should be used for inserting an OPA in infants.***
♦ Advance the airway until the flange rests on lips	• **DO NOT** secure the OPA with tape. If the OPA is taped it cannot be removed quickly and aspiration may occur if the patient regains consciousness or a gag reflex and vomits. • The curvature of the OPA follows the contour of the tongue with the flange resting against the lips and the tip of the OPA opening into the pharynx.
♦ Re-assess airway patency and breathing: • Skin color • Chest rise and fall • Upper airway sounds ** **Check position of OPA, and suction - *if indicated*** ** **Administer oxygen via mask or ventilate with BMV- *per Los Angeles County EMS Agency Reference No. 1304***	• Upper airway sounds such as grunting, snoring, stridor, etc. indicate a partial airway obstruction. When present, steps to relieve the partial obstruction must be taken. • Perform airway maneuvers to ensure a patent airway, remove OPA if indicated, and repeat ABCs and reconfirm size of OPA. • Ventilate with an appropriate device at the appropriate rate: ~ Adult - 10-12/minute (every 5-6 seconds) ~ Intubated adult 10/minute (1 breath every 6 seconds) ~ Infant/Child - 12-20/minute (1 breath every 3-5 seconds) ~ Neonate –40-60/minute (every 1-2 seconds)

REMOVAL OF OPA PROCEDURE

Skill Component	Key Concepts
♦ Remove airway: • Grasp flange and guide the OPA out by directing airway down toward chin **Suction oropharynx - *if indicated***	• Remove the OPA if the patient: - is not tolerating the OPA - is vomiting - regains consciousness - regains a gag reflex
♦ Reassess airway patency and breathing: • Skin color • Chest rise and fall • Upper airway sounds	
♦ Administer oxygen via mask, nasal cannula, or BMV device - ***if indicated per Los Angeles County EMS Agency Reference No. 1304*** ***Place the patient on a pulse oximeter device – if available***	• A goal of oxygen administration is to deliver the minimum amount of oxygen to meet the needs of the patient and to maintain an oxygen saturation level at or above 94%. • When available, use pulse oximetry to guide oxygen delivery. The desired SpO_2 for most non-critical patients is 94-98%. • **SPECIAL CONSIDERATION:** For chronic obstructive pulmonary disease (COPD), the goal is to titrate oxygen to keep the SpO_2 at 88-92%. • Document the SpO_2 reading on the EMS Report or ePCR.
♦ Dispose of contaminated equipment using an approved technique	• Place the contaminated equipment in plastic bag, seal, and dispose of at designated site.

RE-ASSESSMENT (Ongoing Assessment)	
Skill Component	**Key Concepts**
♦ Re-assess airway and breathing • Continuously or at least every five (5) minutes • Changes in airway sounds • Changes in respiratory status ***Manage patient condition as indicated.**	• Assess airway and breathing at least every five (5) minutes or if there are changes in airway sounds or respiratory status. • Evaluating and comparing the results from a prior assessment assists with recognizing that the patient is improving, responding to treatment or condition is deteriorating.

PATIENT REPORT AND DOCUMENTATION	
Skill Component	**Key Concepts**
§ Give patient report to equal or higher level of care personnel	• The report should consist of all pertinent information regarding the assessment findings, treatment rendered, and the patient's response to care provided.
§ Verbalize/Document • Indication for insertion • Indication for removal - *if applicable* • Patient tolerance/effect • Size of OPA used • Respiratory assessment: - rate - effort/quality - tidal volume Oxygen administration - *If needed* - airway adjunct/ventilatory devices used - oxygen liter flow - ventilation rate	• Documentation must be on either the Los Angeles County EMS Report form, departmental Patient Care Record form, or ePCR. • Documenting reassessment information provides a comprehensive picture of patient's response to treatment. • The last reassessment information (before patient care is transferred) should be documented in the section of the EMS form.

Developed: 1/01 Revised 10/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

AIRWAY EMERGENCY / AIRWAY MANAGEMENT
OROPHARYNGEAL AIRWAY (OPA)

Supplemental Information

INDICATIONS:

- Any unresponsive patient without a gag reflex who has difficulty maintaining a patent airway.
- Unresponsive apneic patient needing positive pressure ventilations with a BMV.

CONTRAINDICATIONS:

- Conscious or semi-conscious patient
- Gag reflex
- Clenched teeth
- Oral trauma

COMPLICATIONS:

- Vomiting
- Laryngospasm
- Injury to hard or soft palate (tearing, bleeding, etc)
- Airway obstruction

NOTES:

- Every unresponsive patient needs to be evaluated for a patent airway and have an appropriate airway adjunct (NPA or OPA) inserted if they have or do not have a gag reflex.
- A noisy airway is a partially obstructed airway.
- Purpose of an OPA is to prevent obstruction of the upper airway by the tongue and allows for air exchange.
- An oropharyngeal airway does not protect the lower airway from vomitus or secretions.
- Caution must be taken during insertion of the OPA that the tongue is not pushed posteriorly and occlude the airway.
- Too small of an airway will not adequately hold the tongue forward.
- Too long of an airway can press the epiglottis against the opening of the trachea and result in an airway obstruction.
- Improper positioning or insertion of the airway can push the tongue against the oropharynx and result in airway obstruction.
- A second rescuer is needed to maintain in-line axial stabilization if spinal immobilization is required.

COMPONENTS OF AN AIRWAY BAG:	
BMV devices – adult, child, infant	**Portable suction**
OP/NP airways – all sizes	**Suction equipment– various sizes**
Nasal cannula	**Portable oxygen cylinder and oxygen regulator**
Simple face mask – adult, child, and infants	**Pulse Oximeter**
Non-rebreather – adult, child, and infants	**Water soluble lubricant**

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

AIRWAY EMERGENCY / AIRWAY MANAGEMENT
NASOPHARYNGEAL AIRWAY (NPA)

PERFORMANCE OBJECTIVES
Demonstrate competency in sizing, inserting, and removing a nasopharyngeal airway.

CONDITION
Insert a nasopharyngeal airway in a simulated adult or child who is breathing and has a gag reflex, but has difficulty maintaining a patent airway. Necessary equipment will be adjacent to the manikin or brought to the field setting.

EQUIPMENT
Adult and pediatric airway manikin, various sizes of nasopharyngeal airways, silicone spray, water-soluble lubricant, goggles, masks, gown, gloves, pediatric resuscitation tape, and airway bag.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.

INSERTION OF NASOPHARYNGEAL AIRWAY PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions	• Mandatory personal protective equipment – gloves at all times • Situational - goggles, masks, gown as needed
♦ State the indications for insertion of a nasopharyngeal airway (NPA) • Semiconscious or unresponsive with an intact gag Reflex • Semiconscious or unresponsive child who is < 12 months of age • Teeth are clenched and an oropharyngeal airway (OPA) cannot be inserted • Oral trauma when an OPA is contraindicated	• In most cases, the use of an NPA is better tolerated than an OPA. • An NPA is less likely to stimulate vomiting. • Even when inserted correctly, minor bleeding may occur.
♦ State the contraindication for the insertion of an NPA • Less than 12 months of age	• Contraindicated in patients less than 12 months due to the small diameter of the nostrils and adenoidal tissue. • Evidence no longer supports that facial fractures and/or basilar skills fractures are a contraindication for the placement of an NPA
♦ Select the patient's right nostril for NPA insertion ***Switches to left nostril if unsuccessful in right nostril***	• The patient's right nostril is preferred since it is generally larger than the left. • The right nostril should be is attempted first <u>unless</u> the left nostril is larger than the right or if there is a contraindication for using the right. However, whichever nostril is chosen for insertion should provide the same benefit or insertion.
♦ Select appropriate size nasopharyngeal airway by measuring the: • <u>Diameter</u> - size of the patient's nostril or tip of little finger • <u>Length</u> – tip of the nose to the tip of the earlobe, tragus, or angle of the lower jaw	• The tragus is the small pointed prominence of the external ear that is situated in front of the ear canal. • To ensure correct length: - If the airway has an adjustable flange, use it to mark the length. - If no adjustable flange is present, hold a finger at correct mark throughout insertion (depth point). • The length of the NPA must be long enough to supply an air passage between the tongue and the posterior pharynx

Skill Component	Key Concepts
♦ Lubricate with a water-soluble lubricant	• Only water soluble lubricants may be used. DO NOT use petroleum based lubricants. They may cause damage to the lining of the nasal cavity and the pharynx, thereby increasing the risk of infection and bronchial pneumonia. • Lubrication minimizes resistance and decreases irritation to the nasal passage.

INSERTION OF THE NPA PROCEDURE

Skill Component	Key Concepts
♦ Push the tip of the nose upward and maintain the head in a neutral position	
♦ Hold the NPA in a "pencil-grip" fashion near the flange	• Holding the NPA in a "pencil-grip" provides the appropriate alignment for the insertion of the NPA.
♦ Insert the NPA with the bevel towards nasal septum	• The patient's right nostril should be is attempted first unless the left nostril is larger than the right or if there is a contraindication for using the right. • Placement of the NPA into the nares should not cause blanching of the nostril. If blanching occurs, the NPA is too large and a smaller diameter NPA must be used to prevent tissue necrosis. • If resistance is met, a gentle back-and-forth rotation between the fingers will help guide the NPA into the nasopharynx. If resistance continues, withdraw the NPA, re-lubricate, and attempt to insert into the other nostril.
♦ Advance NPA by directing tip along floor of nasal cavity until the flange is seated outside of the nostril: • Right nostril: - Advance 2/3 of the measured length - Continue to advance NPA until flange is seated against outside of nostril or marked area is reached • Left nostril: - Insert approximately 1" or until resistance is met - Rotate 180^{O} into position - Advance 2/3 of the measured length - Advance until flange is seated against outside of nostril or marked area is reached	• If resistance if felt, rotating the NPA 180^{O} allows for the curvature of the NPA to conform to the natural curve of the nasal cavity. • When NPA is in position, the tip is in the posterior pharynx and should prevent possible obstruction by the tongue if it falls back into the oropharynx.
♦ Confirm proper position of the NPA: • Patient tolerates airway • Feel at proximal end of airway for airflow on expiration • Check nostril for blanching	• An NPA is usually well tolerated by conscious or semi-conscious patients who are having difficulty maintaining an airway. • If the patient gags in the final stage of insertion, the airway is too long and the NPA needs to be withdrawn slightly. • If nostril shows signs of blanching, the NPA is too large and a smaller diameter needs to be inserted.
♦ Reassess airway patency and breathing: • Skin color • Rise and fall of chest • Upper airway sounds ** ***Reposition head, check position of NPA, or suction - if indicated*** ** ***Administer oxygen via mask or ventilate with bag-mask ventilation (BMV) at appropriate rate - if indicated***	• Upper airway sounds such as grunting, snoring, stridor, etc. indicate a partial airway obstruction. When present, steps to relieve the partial obstruction must be taken. • Suction or perform airway maneuvers to assure a patent airway, remove NPA if indicated and repeat ABCs and reconfirm size of NPA. • Ventilate with BMV device at appropriate rate: ~ Adult - 10-12/minute (every 5-6 seconds) ~ Intubated adult 10/minute (1 breath every 6 seconds) ~ Infant/Child - 12-20/minute (1 breath every 3-5 seconds) ~ Neonate – 40-60/minute (every 1-2 seconds)

REMOVAL OF NASOPHARYNGEAL AIRWAY
PROCEDURE

Skill Component	Key Concepts
♦ Remove airway by grasping the flange and guiding the NPA out while directing the NPA down toward the chin ****Suction oropharynx - *if indicated*** *****Place the patient on a pulse oximeter device – if available***	• Remove the NPA if: - the patient is not tolerating the NPA - an advanced airway is to be inserted
♦ Re-assess airway patency and breathing: • Skin color • Chest rise and fall • Upper airway sounds	
♦ Administer oxygen via mask, nasal cannula, or BMV device – ***if indicated per Los Angeles County EMS Agency Reference No. 1304***	• A goal of oxygen administration is to deliver the minimum amount of oxygen to meet the needs of the patient and to maintain an oxygen saturation level of 94-98%. • When available, use pulse oximetry to guide oxygen delivery. The desired SpO_2 for most non-critical patients is 94-98%. • **SPECIAL CONSIDERATION:** For chronic obstructive pulmonary disease (COPD), the goal is to titrate oxygen to keep the SpO_2 at 88-92%. • Document the SpO_2 reading on the EMS Report or ePCR.
♦ Dispose of contaminated equipment using an approved technique	• Place the contaminated equipment in plastic bag, seal, and dispose of at designated sites.

RE-ASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
♦ Assess airway and breathing at least every five (5) minutes or sooner: • Changes in airway sounds • Changes in respiratory status • Respiratory assessment: - rate - effort/quality - tidal volume • Pulse ox reading *****Manage patient condition as indicated.***	• Assess airway and breathing at least every five (5) minutes or if there are changes in airway sounds or respiratory status. • Evaluating and comparing the results from a prior assessment assists with recognizing that the patient is improving, responding to treatment or condition is deteriorating.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Give patient report to equal or higher level of care personnel	• The report should consist of all pertinent information regarding the assessment findings, treatment rendered, and the patient's response to care provided.
§ Verbalize/Document: • Indication for insertion • Indication for removal - *if applicable* • Patient tolerance • Size of NPA used • Respiratory assessment: - rate - effort/quality - tidal volume • Oxygen administration - *If needed* - airway adjunct/ventilatory devices used - oxygen liter flow - ventilation rate	• Documentation must be on either the Los Angeles County EMS Report form, departmental Patient Care Record form, or ePCR • Documenting reassessment information provides a comprehensive picture of patient's response to treatment. • The last reassessment information (before patient care is transferred) should be documented in the section of the EMS form.

Developed: 9/02 Revised 10/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

AIRWAY EMERGENCY / AIRWAY MANAGEMENT
NASOPHARYNGEAL AIRWAY (NPA)

Supplemental Information

COMPLICATIONS:

- Vomiting
- Laryngospasm if the airway is too long
- Injury and pressure necrosis to nasal mucosa
- Laceration of adenoids or tissue lining the nasal cavity
- Severe nosebleed
- Airway obstruction if kinked or clogged

NOTES:

- Every unresponsive patient needs to be evaluated for a patent airway and have an appropriate airway adjunct (NPA or OPA) inserted if they have or do not have a gag reflex.
- Too short of an airway that does not extend past the tongue may obstruct the airway if the tongue falls back into the oropharynx.
- Too long of an airway may pass into the esophagus and cause hypoventilation and gastric distention.
- A nasopharyngeal airway does not protect the lower airway from vomitus or secretions or hold the tongue forward.
- Never force a nasopharyngeal airway into nostril. If an obstruction or deviated septum is encountered, remove the NPA and try the other nostril.
- Use soft, flexible NPAs rather than the rigid, clear plastic NPAs which will less likely cause soft-tissue damage or nose bleeds.
- A second rescuer is needed to maintain in-line axial stabilization if spinal motion restriction is required.

COMPONENTS OF AN AIRWAY BAG:	
BMV devices – adult, child, infant	**Portable suction**
OP/NP airways – all sizes	**Suction equipment – various sizes**
Nasal cannula	**Portable oxygen cylinder & oxygen regulator**
Simple face mask – adult, child, and infants	**Pulse Oximeter**
Non-rebreather – adult, child, and infants	**Water soluble lubricant**

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

BREATHING EMERGENCY / AIRWAY MANAGEMENT
BAG - MASK - VENTILATION (BMV)
UNPROTECTED AIRWAY

PERFORMANCE OBJECTIVES
Demonstrate proficiency in ventilating a simulated patient utilizing a Bag Mask Ventilation (BMV) device.

CONDITION
Ventilate a simulated adult, child, or infant in respiratory arrest (with an unprotected airway) for a minimum of one (1) minute using the 1 and 2 rescuer technique. Necessary equipment will be adjacent to the patient or brought to the field setting.

EQUIPMENT
Adult, child or infant manikin, adult and pediatric BMV device O_2 connecting tubing, oxygen source with flow regulator, oropharyngeal and nasopharyngeal airways appropriate for manikin, silicone spray, water-soluble lubricant, 10cc syringe, pediatric resuscitation tape, suction, goggles, masks, gown, gloves, timing device, airway bag.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.
- Ventilation must be at least at the minimum rate required for the situation given.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions	• Mandatory personal protective equipment – gloves at all times • Situational - goggles, masks, gown as needed
♦ Assess breathing for: • Rate • Depth • Quality • SpO_2 – if available	• Signs and symptoms of breathing difficulties include: - Shortness of breath - Wheezing - Inadequate tidal volume - Cyanosis - Tachypnea - Nasal flaring - Position of the patient (tripod) - Altered level of consciousness • Pulse oximetry measures the oxygen saturation (SpO_2) of the patient's arterial blood. • Signs and symptoms of hypoxia may include SpO_2 readings of less than 94% with respiratory distress, altered mental status, or changes in skin signs.
♦ Select the appropriate size mask and bag	• Ideally rescuers should use the appropriate size bag and mask. However, the size of the bag is not as important as the size of the mask. ***Note:*** *If an adult bag is used on a pediatric patient, the tidal volume delivered should not exceed the pediatric patient's normal chest rise of normal inspiration.*
♦ Assemble the BMV device **** ALS providers - Place continuous waveform capnography sensor between the bag and mask - *if available***	• Waveform capnography measures the carbon dioxide (CO_2) in a patient's exhaled breath (immediate graphic depiction of ventilation). It also (indirectly) measures metabolism and circulation. • End-tidal carbon dioxide ($EtCO_2$) measures the CO_2 in an expired breath. • Since waveform capnography is a measure of ventilation and pulse oximetry is a measure of oxygenation, ALS providers should use both devices to assess the patient's respiratory status. • DO NOT delay the initiation of BMV ventilation.

Skill Component	Key Concepts
♦ Connect BMV device to oxygen source	• Do not delay ventilation to connect the BMV device to an oxygen source; may be done after ventilations have started.
♦ Turn oxygen regulator to deliver 15L/minute - *if indicated*	

SINGLE RESCUER BAG-MASK VENTILATION PROCEDURE	
Skill Component	**Key Concepts**
♦ Open the airway: • Medical - head-tilt/chin-lift • Trauma - jaw-thrust	• Move the patient no more than necessary to ensure an open airway. • A 2nd rescuer is needed to maintain in-line axial stabilization if spinal immobilization is required. *Note: If only one (1) rescuer is available to maintain spinal motion restriction and ventilate with a BMV device, the EMT may use his/her knees to stabilize the head.* • It is important to maintain a neutral position in pediatric patients to prevent hyper-flexion of the neck which may inhibit ventilations or occlude the airway (head is relatively large for size of the body). • ***Note: Place approximately two (2') of padding under the shoulders or entire torso to achieve appropriate airway alignment.***
♦ Remove visible obstruction or suction – *if indicated*	
♦ Insert oropharyngeal (OPA) or nasopharyngeal (NPA) airway – if indicated	• NPAs are contraindicated in infants (less than 12 months) due to the small diameter of the nostril and presence of adenoidal tissue. • Some NPA airways may extend past the nostrils. This results in inability to maintain a tight seal and inhibits the function of the NPA when the mask is in place.
♦ Place the mask over the mouth and nose, maintaining a tight seal and patent airway by using the C-E technique ** ***The top of the mask is over the bridge of the nose and the bottom is in the groove between the lower lip and the chin.***	• Avoid pushing mask down on the face. Pressure on the eyeballs results in vagal stimulation – especially in pediatric patients. • Avoid pressure on soft tissue under the chin which may result in airway obstruction.
♦ Ventilate the patient with the appropriate volume: • Observe for adequate rise and fall of chest • Allow for adequate exhalation between ventilations	• Use only enough force to allow for good chest rise. Over-inflation causes gastric distention which will decrease tidal volume by elevating the diaphragm. • Exhalation requires more time than inspiration. • The bag is refilled with oxygen when it expands during the time the patient exhales.
♦ Ventilate patient at approximate rate of: • Adult - 10-12/minute (1 breath every 5-6 seconds) • Child - 12-20/minute (1 breath every 3-5 seconds) • Infant - 12-20/minute (1 breath every 3-5 seconds) • Neonate 40-60/minute – to maintain heart rate > 100/minute (AHA 2015)	• If a pulse oximetry or wave form capnography measuring device is used, the appropriate ventilation rate is the least number of ventilations needed per minute to keep the neonate oxygenated and keep the end-tidal carbon dioxide ($EtCO_2$) within the normal range. ***Note: Do not hyperventilate the patient. Hyperventilation does not improve oxygenation, and may lead to hypocapnia and eventually respiratory alkalosis and cardiac arrest.***

Skill Component	Key Concepts
♦ Reassess: • Rate • Depth • Quality • SpO_2 – if available • $ETCO_2$ if ALS ***Suction - <u>if indicated</u>***	• Continually assess respiratory status with each ventilation. • Lung compliance provides information of successful inspiration or if there is interference with air delivery due to inadequate mask seal and airway or thoracic problems. • In pediatric patients the resistance felt will generally be greater than in an adult due to the smaller size of the bronchi and bronchioles. • In pediatric patients, hypoxia results in bradycardia which may lead to asystole. Reassess heart rate in neonates every 30-60 seconds and in infants and children every 1-2 minutes without stopping ventilations.
TWO (2) RESCUER BAG-MASK VENTILATION PROCEDURE	
♦ Instruct the 2nd rescuer to open the airway: • <u>Medical</u> - head-tilt/chin-lift • <u>Trauma</u> - jaw-thrust	• Avoid excessive movement of the patient. Excessive movement may lead to an airway obstruction. • The 2nd rescuer is needed to maintain and ensure the airway remains open. ***<u>Note</u>: If spinal motion restriction is needed, the 2nd rescuer will provide in-line axial stabilization*** • It is important to maintain a neutral position in <u>pediatric</u> patients to prevent hyper-flexion of the neck which may inhibit ventilations or occlude the airway (head is relatively large for size of the body). ***<u>Note</u>: Place approximately two (2') of padding under the shoulders or entire torso to achieve appropriate airway alignment.***
♦ Look inside the mouth and throat for a visible obstruction; if seen and it can be removed, remove it.	
♦ Insert oropharyngeal (OPA) or nasopharyngeal (NPA) airway – if indicated	• NPAs are contraindicated in infants (less than 12 months) due to the small diameter of the nostril and presence of adenoidal tissue. • Use of a NPA may hinder the ability to achieve an adequate mask seal when using a BMV device.
♦ Place mask over mouth and nose: ** ***Instruct the 2nd rescuer to maintain a tight seal and patent airway using one of the following two-handed techniques:*** • ***Double C-E clamp technique*** • ***Thenar eminences (TE) technique***	• The jaw-lift maneuver should be used when performing two-rescuer bag-mask-ventilations. • Avoid using excess force while pressing the mask down on the face. Excess pressure on the eyeballs results in vagal stimulation – especially in pediatric patients. • The top of the mask-fits over the bridge of the nose and the bottom fits in the groove between the lower lip and the chin. • Excess pressure on soft tissue under the chin may result in airway obstruction. • The thenar eminences allow the rescuer to do a good jaw-lift and create a more reliable seal while using the strongest muscles of the hands.  • The two (2) rescuer technique is the preferred method *Also called the two-thumbs down technique* Double C-E Technique  Thenar eminence Technique

Skill Component	Key Concepts
♦ Ventilate the patient with appropriate tidal volume: • Observe for effective rise and fall of chest • Allow for adequate exhalation between ventilations	• Use only enough force to allow for good chest rise. Over-inflation causes gastric distention, which will decrease tidal volume by elevating the diaphragm. • Exhalation requires more time than inspiration. • The bag is refilled with oxygen when it expands during the time the patient exhales.
♦ Ventilate the patient at approximate rate of: • Adult - 10-12/minute (1 breath every 5-6 seconds) • Child - 12-20/minute (1 breath every 3-5 seconds) • Infant - 12-20/minute (1 breath every 3-5 seconds) • Neonate 40-60/minute – to maintain heart rate to greater than 100/minute (AHA 2015)	• If working alongside ALS and a pulse oximetry or capnography wave form measuring device is used, the appropriate ventilation rate is the least number of ventilations needed per minute to keep the patient oxygenated and keep the end-tidal carbon dioxide ($EtCO_2$) within the normal range (35-45mmHg). *Note:* ***Do not hyperventilate the patient.*** *Hyperventilation does not improve oxygenation, and may lead to hypocapnia and eventually respiratory alkalosis and cardiac arrest.*
♦ Re-assess: • Rate • Depth • Quality • SpO_2 – if available *****Suction - if indicated***	• Continually assess for improvement of the patient's respiratory status with each ventilation. • Lung compliance provides information of successful inspiration or if there is interference with air delivery due to inadequate mask seal and airway or thoracic problems. • In pediatric patients the resistance felt will generally be greater than in an adult due to the smaller size of the bronchi and bronchioles. • In pediatric patients, hypoxia results in bradycardia which may lead to asystole. Re-assess heart rate in neonates every 30-60 seconds and in infants and children every 1-2 minutes without stopping ventilations.

REASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
♦ Re-assess the patient every five (5) minutes or sooner. • Primary assessment • Relevant portion of the secondary assessment • Vital signs: Blood Pressure, Pulse, and Respirations • SpO_2 • $ETCO_2$ if ALS	• This is a priority patient and must be re-evaluated at least every five (5) minutes.
♦ Evaluate the results of the ongoing assessment and compare to baseline condition and vital signs. *****Manage patient condition as indicated.***	• Evaluating and comparing results assists with recognition of whether the patient is improving, remains the same, or if their condition is deteriorating.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Verbalize/Document: • Percent of oxygen/Liter flow • Ventilation rate • Size of nasopharyngeal or oropharyngeal adjunct • Resistance encountered (lung compliance) • Gastric distention - *if developed* • Dentures and location - *if removed* • Response to ventilation - chest rise and fall - color - level of consciousness	• Documentation must be on either the Los Angeles County EMS Report form, ePCR, or department Patient Care Record. • Documenting reassessment information provides a comprehensive picture of patient's response to treatment.

CARE of EQUIPMENT	
Skill Component	**Key Concepts**
♦ Dispose of contaminated equipment using approved technique.	• Place contaminated equipment in plastic bag, seal, and dispose at designated sites. *Note: When releasing patient to higher level of care personnel, leave equipment to continue patient management.*

Developed 11/00 Revised, 10/2018

BREATHING EMERGENCY / AIRWAY MANAGEMENT
BAG-MASK- VENTILATION (BMV)
UNPROTECTED AIRWAY

Supplemental Information

INDICATIONS:
- Respiratory arrest
- Respiratory compromise (hypoxia)

COMPLICATIONS:
- Gastric distention
- Vomiting

DEFINITIONS:
- Capnography wave form – graphic depiction of the partial pressure of carbon dioxide exhaled with each breath. It provides an immediate picture of ventilation and indirectly measures metabolism and circulation.
- End-tidal carbon dioxide ($EtCO_2$) – measures the carbon dioxide (CO_2) concentration ~~of~~ in exhaled air– normal value 35-45mmHg
- Hypocapnia – too little carbon dioxide in the blood stream.
- Lung compliance (resistance) -- measure of how easy it is to inflate the lungs. If compliance is high, the lungs are easy to inflate. If compliance is low the lungs are hard to inflate (stiffer lungs).
- Pulse oximetry – measures the oxygen saturation in arterial blood (SpO_2) -- normal values are 94-98% and 88-92% in COPD patients
- Respiratory alkalosis – rise in blood pH and may cause dizziness, tingling of the lips, hands or feet, headache, weakness, fainting and seizures and in extreme cases it can cause carpopedal spasms (contraction of the hands and feet).

INDICATIONS OF ETCO2 VALUES:
- The goal for most patients is to ventilate the patient such that the value is between 35-45mmHg
- In a spontaneously breathing patient the relationship between the measure $EtCO_2$ value and respiratory status is more complex. Both abnormally high and abnormally low values of $EtCO_2$ can indicate respiratory failure. In addition to primary respiratory processes, abnormal levels my represent compensatory mechanisms for a metabolic process, in particular low $EtCO_2$ can also represent compensatory hyperventilation in metabolic acidosis.
- In a patient receiving positive pressure ventilation but not in cardiac arrest:
  - If reading is greater than 45mmHg – CO_2 is high and indicative of hypoventilation and respiratory acidosis.
  - If reading is below 35mmHg – CO_2 is low and indicative of hyperventilation and respiratory alkalosis.
- In a patient in cardiac arrest:
  - A reading above 10mmHg indicates quality CPR
  - A reading below 10mmHg signifies a bad prognosis
  - A sudden increase above 35mmHg indicates ROSC

NOTES:
- The BMV device should have either no pressure-relief (pop-off) valve or a valve with an override feature to permit use of high pressures which may be necessary to achieve visible chest rise and effective ventilation.
- Using a BMV device with an oxygen reservoir attached to an oxygen source that delivers 15L/minute can provide a 90% or greater concentration of inspired oxygen. However, the effectiveness of the BMV device depends on the volume of gas that is squeezed out of the bag and if a proper seal is maintained.
- In cases of gastric distension, continue ventilations using appropriate airway maneuvers.
- In pediatric patients, hypoxia results in bradycardia which may lead to asystole. Re-assess heart rate in neonates every 30-60 seconds and in infants and children every 1-2 minutes without stopping ventilations.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

BREATHING EMERGENCY: OXYGEN DELIVERY

NOTE:

THIS SKILL SHOULD BE TAUGHT AFTER PATIENT ASSESSMENT

PERFORMANCE OBJECTIVES

Demonstrate proficiency in the administration of oxygen by utilizing an oxygen tank and regulator, oxygen masks, nasal cannula, and providing oxygen by blow-by method.

CONDITION

Administer oxygen to a patient whose condition requires supplemental oxygenation by a mask, nasal cannula (NC), or blow-by method. Necessary equipment will be adjacent to the manikin or brought to the field setting.

EQUIPMENT

Adult CPR manikin, O_2 connecting tubing, simple O_2 mask, non-re-breather mask, nasal cannula, oxygen source with flow regulator, oropharyngeal and nasopharyngeal airways appropriate for manikin, silicone spray, water-soluble lubricant, goggles, masks, gown, gloves, suction, timing device, airway bag

PERFORMANCE CRITERIA

- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required, if indicated.
- Items identified by (§) should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions	• Mandatory (minimal) personal protective equipment – gloves
♦ Assess scene safety/scene size-up ** ***Consider Spinal Motion Restriction - <u>if indicated</u>***	• If trauma is suspected, treat as trauma (determined by environment and information obtained from bystanders).
♦ Evaluate need for additional BSI precautions	• Situational - goggles, mask, gown
♦ Introduce yourself to the patient/caregivers	• Communication is important when dealing with the patient, family, or caregiver. This is a very critical and frightening event for all involved and providing information helps in decreasing the stress they are experiencing and promotes patient cooperation.
♦ Determine the need for oxygen administration **Place a pulse oximetry device on the patient and determine the need for oxygen delivery – *if available.* ***Clean the patient's finger by using an alcohol wipe, or 2X2 gauze soaked in Normal Saline.* ***Palpate the radial pulse to ensure that it correlates with the LED display* ***Read the display*	• If pulse oximetry is not available on a BLS unit, and the patient is in mild or moderate respiratory distress, provide oxygen via nasal cannula (NC) at 2-6 liters per minute. • When available, use pulse oximetry to guide oxygen delivery. The desired SpO_2 for most non-critical patients is 94-98%. • Signs and symptoms of hypoxia may include O_2 saturation (SpO_2) less than 94% with respiratory distress, altered mental status, or changes in skin signs.

SETTING UP OXYGEN CYLINDER AND REGULATOR PROCEDURE

Skill Component	Key Concepts
♦ Confirm that it is a "medical grade" oxygen cylinder	• To confirm that the cylinder contains medical grade oxygen: - check color of cylinder - green and white, solid green, or unpainted aluminum with a green ring around top of cylinder - pin index groupings line up with oxygen regulator
♦ Clear dust or debris from the opening	• To clear dust or debris from the opening, open the main valve slowly until gas flow is heard and then immediately close valve. • The valve stem should not be covered with adhesive tape or petroleum based substances. Both of these may contaminate the oxygen or result in spontaneous combustion due to the presence of pressurized oxygen.
♦ Place a new O-ring (flexible gasket) over the large opening on either the cylinder or regulator	• Some regulators have fixed O rings. **DO NOT** apply an additional O ring. • The O-ring can be placed over the large opening on either the cylinder or regulator opening. • O-rings are manufactured for single-use only and must be replaced every time a regulator is attached.
♦ Secure the regulator to the valve stem: • Align the pin index from the regulator with the holes in the cylinder • Insert the pins of the regulator with the holes in the cylinder • Tighten screw bolt with firm hand pressure to ensure an adequate seal	• Gas regulators have a different pin index and the cylinder valves have specific configurations of holes to prevent accidental administration of the wrong gas. • Tightening the screw bolt with a wrench or other device may cause a break in the seal and damage to the regulator.
♦ Open valve two (2) full turns ** ***If cylinder leaks, turn off valve and check connections***	• A leaking cylinder may be the result of an O-ring this is improperly seated, poor connection between the regulator pins and the cylinder, or debris that does not allow for a proper seal.
♦ Read the pressure gauge to determine the oxygen pressure (psi) in the cylinder ** ***If cylinder is not in use and is near 500 psi – Do Not put in service*** ** ***If cylinder is in use and reaches 200 psi – change cylinder immediately***	• The amount of oxygen pressure in the cylinder is read as pounds per square inch (psi). • The gauge should read approximately 2000 psi. The volume of oxygen varies in the different size cylinders, but when the cylinder is full they will contain a pressure of 2000 psi. • Ideally, portable cylinders should be changed out when the psi is between 500 and 1000 psi. • Cylinders containing < than 200 psi should be changed immediately.
♦ Determine the appropriate oxygen delivery system	• The appropriate oxygen delivery system is dependent on the information gathered during the primary assessment. As the patient's condition changes, the oxygen delivery method may change. • Oxygen delivery devices include nasal cannulas (NC), simple face mask, non-rebreather, bag-mask-ventilation, or blow-by oxygen.

GUIDELINES FOR THE DELIVERY OF OXYGEN

Skill Component	Key Concepts
♦ Initiate O2 therapy for stable patients with mild hypoxia (SpO_2 less than 94%): *****Start O_2 with NC at 2-6 liters per minute by NC or basic mask at 8-10 liters per minute*** ***** Use blow-by technique at 15L/minute if the patient is unable to tolerate an NC or basic mask*** *****Titrate to an SpO_2 of 94-98%***	• A goal of oxygen administration is to deliver the minimum amount of oxygen to meet the needs of the patient and to maintain an oxygen saturation level at or above 94-98%. • Providing oxygen to EMS patients may be a lifesaving measure. Too little and too much oxygen are potentially harmful; therefore, oxygen delivery should be treated like any drug and only administered when indicated. • Patients who are mouth breathers receive minimal benefit from NC oxygen administration.

NASAL CANNULA (NC) PROCEDURE

Skill Component	Key Concepts
♦ Choose the appropriate size nasal cannula	• Nasal cannulas come in adult, child, and infant sizes.
♦ Attach the NC tubing to the regulator	
♦ Set oxygen to appropriate liter flow (2-6 Liters/minute)	• NC is a low-flow, low-oxygen concentration delivery device that delivers 24%-44% of oxygen with flow rates of 2-6 Liters/minute. • The flow rate that may be administered via a NC **CANNOT EXCEED** 6 Liters/minute by NC. This will dry out the mucosa or cause oxygen burns to nostrils, but will not increase oxygen delivery.
♦ Check for the flow of oxygen through the NC ***** Listen for leaks where the tubing attaches to the cylinder***	• If leaks are not corrected, the actual concentration of oxygen delivered to the patient may not be accurate.
♦ Place the nasal cannula prongs into the nostrils (nares) correctly	• Curvature of the prongs should be oriented so that the tips will curve down and are slightly posterior once inserted.
♦ Secure the NC by: *****Hold loop of tubing anterior to face and neck*** *****Slip tubing around the patient's ears and under the chin***	• Placing the tubing behind the head may decrease the flow of oxygen. Therefore, slip the tubing around the patient's ears and under the chin.
♦ Adjust the tubing under the chin until the NC is secure	• Tightening the tubing on the NC too tight will cause discomfort.
♦ Evaluate the patient's comfort	• Evaluating the patient's comfort level will assist in the patient's compliance with keeping the NC in place.

MEDIUM CONCENTRATION OXYGEN MASK (SIMPLE FACE MASK) PROCEDURE

Skill Component	Key Concepts
♦ Choose the appropriate size oxygen mask	• Simple face masks come in adult, child, and infant sizes.
♦ Attach oxygen mask tubing to the regulator	
♦ Set oxygen to appropriate liter flow (8-10 Liters/minute)	• A simple face mask delivers up to 60% of oxygen with flow rates of 6-10 Liters/minute. Do not use less than 6 Liters/minute. The most common flow rate used with a simple face mask is 10 Liters/minute. • Flow rates greater than 10 Liters/minute does not increase oxygen delivery and may result in patient discomfort and drying of mucus membranes.

Skill Component	Key Concepts
♦ Check for the flow of oxygen through the simple face mask ***** Listen for leaks where the tubing attaches to the cylinder***	• If leaks are not corrected, the actual concentration of oxygen delivered to the patient may not be accurate. ☠ ***Never apply an oxygen mask on the patient without supplemental oxygen flowing; this results in the patient re-breathing their own CO_2, acidosis, hypoxia and possible death.***
♦ Place the narrow end of the mask over the bridge of the patient's nose	
♦ Place the oxygen mask on patient's face covering both nose and mouth with narrow end over the bridge of the nose	• The application of an oxygen mask on the patient poses a risk for aspiration if the patient vomits. Therefore, the mask must be removed if the patient complains of nausea. Consider switching the patient to a NC.
♦ Secure the mask by slipping elastic strap over patient's head and either above or below ears	
♦ Adjust elastic strap until mask is secure	• Tightening the straps on the mask too tight will cause discomfort.
♦ Form the metal strip over the bridge of the nose for a secure fit	• Leakage around the mask decreases the delivery of oxygen.
♦ Evaluate the patient's comfort	• Evaluating the patient's comfort level will assist in the patient's compliance with keeping the mask in place.

HIGH CONCENTRATION OXYGEN MASK (NON-REBREATHER RESERVOIR MASK) PROCEDURE

Skill Component	Key Concepts
♦ Choose the appropriate size non-rebreather mask	• Non-rebreather masks in adult, child, and infant sizes.
♦ Attach the non-rebreather tubing to the regulator	•
♦ Unroll the oxygen reservoir bag – if appropriate	
♦ Ensure oxygen tubing is attached to the non-re-breather device	• Using a smaller reservoir bag in infants and children is appropriate as they have a smaller tidal volume.
♦ Set oxygen to appropriate liter flow 15 Liters/minute	• A non-rebreather mask is a low-flow, high-oxygen concentration device that delivers up to 90-95% with flow rate of 15 Liters/minute.
♦ Inflate reservoir bag completely by holding finger over valve located inside the mask above the reservoir bag insertion	• The reservoir bag must be inflated completely before placing the mask on the patient.
♦ Check for the flow of oxygen through the non- rebreather mask ** ***Feel for the flow of oxygen through the tubing*** ***** Listen for leaks where the tubing attaches to the cylinder*** ** ***If the oxygen reservoir bag dislodges, replace the device.***	• If leaks are not corrected, the oxygen concentration delivered to the patient will not be accurate. ☠ ***Never apply an oxygen mask on the patient without supplemental oxygen flowing; this results in the patient re-breathing their own CO_2, acidosis, hypoxia and possible death.***
♦ Attach oxygen supply tubing to the oxygen mask	•
♦ Place the narrow end of the mask over the bridge of the patient's nose	•

Skill Component	Key Concepts
♦ Place the mask on the patient's face covering both the nose and mouth with the narrow end over the bridge of the nose	• If the non-rebreather mask is placed upside down on the patient's face there will not be an adequate seal and the oxygen concentration being delivered to the patient will be significantly decreased. • The reservoir bag will be below the mask.
♦ Slip the elastic strap over patient's head and place just above the ears	
♦ Adjust elastic straps until the mask is secure	• Mask must be secure, but not so tight that it causes discomfort
♦ Form the metal strip over the bridge of the nose for a secure fit	• Leakage around the mask decreases the delivery of oxygen.
♦ Evaluate the patient's comfort	• Evaluating the patient's comfort level will assist in the patient's compliance with keeping the mask in place. • <u>During inspiration</u> -- exhalation valves on the sides of the mask close, valve above the reservoir bag opens, and reservoir bag deflates slightly. • <u>During exhalation</u> – exhalation valves at the sides of the mask open, valve above the reservoir bag closes, and reservoir bag expands completely.

BLOW-BY OXYGEN ADMINISTRATION PROCEDURE

Skill Component	Key Concepts
♦ Choose the appropriate size oxygen face mask to use with blow-by oxygen	• Simple face masks come in adult, child, and infant sizes. **NOTE:** The appropriate oxygen delivery device is dependent on the information gathered during the primary assessment. As the patient's condition changes, the oxygen delivery method may change.
♦ Attach oxygen supply tubing the regulator	• Blowing oxygen near the patient's face is not a reliable means of oxygen delivery and generally should not be used with adults. However, for agitated patients who do not tolerate a nasal cannula or face mask, it may provide some oxygen to the patient when oxygen is indicated by the SpO_2 reading.
♦ Set oxygen to appropriate liter flow: • Adult –15 Liters/minute • Infant/Child - 15 Liters/minute • Neonate –15 Liters/minute	• The use of blow-by oxygen is controversial as studies have demonstrated that the blow-by technique does not provide adequate oxygen to a patient who needs oxygen delivered. • For infant/child the liter flow depends on the flow rate and proximity to the face. • Oxygen flow rates less than 15 Liters/minute would not deliver much, if any oxygen to the patient. • Blow-by oxygen administration is **<u>NEVER</u>** considered a first-line method for oxygen delivery.
♦ Check for the flow of oxygen through the tubing	• Feel for the flow of oxygen through the tubing and listen for leaks where the tubing attaches to the cylinder.

Skill Component	Key Concepts
♦ Administer oxygen by appropriate method: • Adult – - Use face mask and hold approximately 1”-2” from face • Infant/Child – - Use face mask and hold approximately 1”-2” from face - Hold tubing 1”-2” from nose and mouth - Place oxygen tubing through small hole in the bottom of a 6-8 oz. paper or cup and hold cup approximately 1”-2” from child’s nose and mouth • Neonate – hold tubing 1”-2” from nose and mouth	• Blow-by oxygen can be delivered by a mask, corrugated tubing, O_2 tubing or through bottom of a paper cup (not Styrofoam cup) or in a toy. • The cup also acts as an oxygen reservoir allowing for better oxygen delivery than if only using the tubing. • If a patient is claustrophobic, attempt the use of a NC prior to switching to blow-by oxygen. • Nasal cannulas and masks may frighten young children. In this case, the use of oxygen tubing may be considered. • With neonates, you must hold the tubing with the opening facing the nose and mouth. • If there is no improvement and hypoxia is suspected another form of oxygen delivery device should be considered.

CHANGING THE OXYGEN SOURCE

Skill Component	Key Concepts
♦ Prepare the new oxygen delivery system	• When a patient is placed into the back of the ambulance, the oxygen delivery system may change to the oxygen delivery system within the transport ambulance. • When the patient reaches the Emergency Department (ED) the oxygen delivery system will change to the oxygen delivery system in the hospital
♦ Turn on the new oxygen cylinder *****Check the pressure gauge to determine how many psi is in the new tank*** *****Ensure the psi in the new cylinder exceeds 500 psi***	• Preparing the new oxygen delivery system prior to discontinuing the oxygen source from the patient minimizes periods of hypoxia.
♦ Remove the tubing from the existing oxygen cylinder	
♦ Attach the oxygen delivery tubing immediately to the new cylinder	• Rapid re-attachment of the oxygen tubing to the new system is essential in minimizing periods of hypoxia.
♦ Check the old pressure gauge to determine how many psi oxygen remains in the original tank – if applicable	• Ideally, portable cylinders should be replaced when the pressure in the tank is between 1000 and 500 psi. • Cylinders should not be put into service if near 500 psi. • If the cylinder is in use, it should never be allowed to go below 200 psi. Oxygen pressure below 200 psi does not deliver the appropriate liter flow and will empty rapidly depending on the liter flow.
♦ Turn off the existing oxygen regulator	•
♦ Take the cylinder out of service – if indicated	•

DISCONTINUING OXYGEN ADMINISTRATION AND DISCONNECTING CYLINDER AND REGULATOR PROCEDURE

Skill Component	Key Concepts
♦ Remove oxygen delivery device from patient and regulator	• The flow of oxygen must be first discontinued from the patient prior to turning off the flow of oxygen.
♦ Check pressure gauge for psi remaining in cylinder	• Ideally, portable cylinders should be replaced when the pressure in the tank is between 1000 and 500 psi. • Cylinders should not be put into service if near 500 psi. • If the cylinder is in use, it should never be allowed to go below 200 psi. Oxygen pressure below 200 psi does not deliver the appropriate liter flow and will empty rapidly depending on the liter flow. Replace the tank immediately.

Skill Component	Key Concepts
♦ Close the regulator valve	
♦ Remove the oxygen tubing from regulator stem	• Once the oxygen delivery tubing has been removed from the regulator stem, it may be placed in the regular trash unless the patient is known to have a respiratory related communicable disease. When this occurs, discard the tubing in a red infectious waste bag.
♦ Close the valve at top of cylinder	
♦ Bleed oxygen out of system • Open regulator valve • Listen for oxygen flow to stop • Close regulator • Check that gauge reads zero with the cylinder valve closed.	• By slowly opening the regulator valve after closing the valve at the top of the cylinder, the oxygen will "bleed" out of the system. Once the sound of oxygen flow ceases, you have cleared the oxygen pressure out of the regulator. • If the oxygen flow gauge does **NOT** say "0," oxygen remains in the line. If this occurs, re-check the valve to ensure it is closed tightly.
♦ Detach regulator by loosening the screw bolt	
♦ Log or label cylinder with psi reading per department or agency protocol	• The oxygen cylinder should be labeled as **"EMPTY"** if near 500 psi. • Various departments and agencies may use a log or use commercial tags. • Adhesive tape should never be used to label readings.
♦ Store oxygen cylinder appropriately	• Never leave cylinders standing in an upright position unless properly secured. If cylinder is dropped and the valve breaks off, the cylinder will act as a missile projectile.

RE-ASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
♦ Re-assess the patient at least every five (**5) minutes for** unstable patients and every **15 minutes for stable** patients. • Primary assessment • Relevant portion of the secondary assessment • Vital signs: BP, Pulse, Respirations	• An unstable patient is one who have abnormal vital signs, S/S of poor perfusion, or if there is a suspicion that the patient's condition may deteriorate. • Continue to monitor the remaining psi of oxygen in the tank.
♦ Evaluate response to treatment	• Patients must be re-evaluated at least every five (5) minutes if any treatment was initiated, medication administered or unless a change in the patient's condition is anticipated.
♦ Evaluate results of on-going assessment and compare to baseline condition and vital signs *****Manage patient condition as indicated.***	• Evaluating and comparing results assists in recognizing patient improvement, responsiveness to treatment, or if the patient is deteriorating. • The need for additional treatment is based upon the information gained during the reassessment.
♦ Continue O_2 therapy until the transfer of patient care has occurred.	• Once oxygen therapy has been initiated, it should be continued until the transfer of patient care has occurred.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Give appropriate report to equal or higher level of care personnel	• The patient report should consist of all pertinent information regarding the assessment findings, treatment rendered, and the patient's response to the care provided. • Report may be given to a lower level of care provider when an ALS to BLS downgrade has occurred **EXCEPTION** – ALS to BLS downgrade

Skill Component	Key Concepts
§ Document: • Oxygen administration device used • Percent of oxygen/Liter flow • Dentures and location - *if removed* • Respiratory rate and tidal volume • Skin color • Level of consciousness • Response to oxygen administration • SpO_2	• Documentation must be on either the Los Angeles County EMS Report Form, ePCR, or departmental form. • The response to oxygen administration may include but not be limited to improved SpO_2 reading, level of consciousness, and work of breathing.

Developed: 10/04 Revised 10/2018

BREATHING EMERGENCY: OXYGEN ADMINISTRATION

Supplemental Information

Definitions:

- Hypoxia – insufficient oxygen delivery to body cells which may lead to organ ischemia and eventually death. Signs/symptoms of hypoxia include increased respiratory rate, increased heart rate, and changes in level of consciousness, restlessness, irritability, and cyanosis.
- Minute volume – total volume inhaled in a minute calculated by multiplying tidal volume and the number of respirations for one minute.
- Respiratory distress – acute condition in which the patient needs to work harder to breath. Signs/symptoms include increased respiratory rate, accessory muscle use, nasal flaring, and difficulty speaking in complete sentences. The patient may assume an upright or a tripod position to aid respiratory muscles.
- Respiratory failure – acute condition in which there is inadequate ventilation to support life and requires immediate positive-pressure ventilations. Signs and symptoms of respiratory failure include altered mental status, loss of muscle tone that progresses to inadequate minute volume. This condition develops when there is respiratory muscle fatigue after prolonged respiratory distress or obstruction of the upper or lower airway.
- Respiratory arrest – agonal or complete cessation of breathing.
- Tidal volume – amount of air inhaled and exhaled during a normal breath.
- Vital capacity (lung capacity) – is compose of the maximum inspiratory reserve volume (IRV), maximum expiratory reserve volume (ERV) and the tidal volume (TV) of a single breath.
- **Manageable Airway**
  - The patient is breathing adequately through a patent airway with effective ventilation.
  - The patient is mechanically ventilated effectively via bag-mask-ventilation (BMV), King LTS-D, but the airway is not fully protected from risk of aspiration.
- **Unmanageable Airway-** The patient is not able to breathe adequately and EMS personnel are not able to maintain the patient's airway and cannot ventilate the patient effectively via BMV, King-LT-D. This is an example of a patient in extremis.
- **Unprotected Airway –** The patient is not able to protect his/her airway from the risk of aspiration and is not being ventilated via a cuffed endotracheal tube. Ventilation may be effective with a BMV, but it is not fully protected from aspiration.

Indications for supplemental oxygen administration:

- Goal of providing supplemental oxygen is to treat patients in respiratory distress and prevent respiratory failure and respiratory arrest.
- Patients should receive oxygen only when needed. Pulse oximetry should be used to guide therapy whenever available. The oxygen saturation goal for most patients is 94-98% and for COPD patients, the goal is 88-92%.
- When pulse oximetry is not available, patients with mild or moderate respiratory distress should receive oxygen at 2-6 Liters/minute via nasal cannula. Oxygen administration should be reassessed once pulse oximetry is available.
- Consider oxygen when respiratory rates suggest respiratory distress or rates do not allow for adequate gas exchange:
  - Adults < 12 and > 20 breaths per minute
  - Children < 15 and > 30 breaths per minute
  - Infants < 25 and > 50 breaths per minute
- When patients do not have adequate improvement with a nasal cannula or their condition worsens, oxygen therapy can be increased to a simple face mask or a non-rebreather mask (NRBM) as needed.
- Blow-by oxygen should **ONLY** be considered when no other oxygen delivery method is tolerated by the patient.

Indications for immediate high-flow O2 include: Per Los Angeles County EMS Agency Reference No. 1304.

- Respiratory Arrest
- Cardiac Arrest
- Shock/Poor Perfusion
- Anaphylaxis
- Traumatic Brain Injury
- Carbon Monoxide Poisoning
- Suspected pneumothorax

BREATHING EMERGENCY: OXYGEN ADMINISTRATION

Supplemental Information (Continued)

Initiation of O2

Start O_2 using the appropriate O_2 delivery system based on the patient's condition and the appropriate oxygen delivery device.

- Nasal Cannula – 2-6L/minute
- Simple Face Mask – 8-10L/minute
- Non-re-breather mask –15L/minute
- Blow-by oxygen – 15L/minute
- BMV with reservoir – 15L/minute
- Endotracheal tube - 15L/minute
- King LTS-D - 15L/minute

Advanced airways

Indications for positive-pressure ventilations: (DO NOT place on supplemental oxygen via nasal cannula or mask)

- Patients with inadequate respirations and tidal volume
- Patients with respiratory failure
- Patients with respiratory arrest

Contraindications:

- None in prehospital care with the above conditions.

Adverse effects of oxygen (can occur even with brief administration in the prehospital setting)

- Oxidative stress on body leading to increased cell death
- Damage to the retina and lungs in newborns
- Respiratory depression, arrest, or altered mental status in patients with COPD
- Delayed recognition of patient deterioration
- Constriction of blood vessels reducing blood flow to vital organs
- Rebound hypoxemia from sudden oxygen withdrawal

Hazards of Oxygen Administration:

Equipment

- There is an increased chance of fire if a spark or flame is introduced into an oxygen-rich environment
- The cylinder becomes a missile if it is punctured or if a valve breaks off
- Explosion may occur if any device attached to the cylinder or outlet valve comes in contact with a petroleum product (lubricant or cleaner; fat-based soap; or adhesive tape)

☠ **Warning:**

- **Patients with cellular hypoxia may develop irreversible cell death leading to vital organ failure and ultimately death.**
- **Never apply an oxygen mask without oxygen flowing, this will result in hypoxia and possible death.**
- **If the reservoir bag from a non-rebreather mask deflates completely, the patient is unable to inhale and hypoxia and/or death will occur.**

Notes:

- Room air (21% oxygen) is sufficient for normal metabolism of healthy individuals. However, if they suffer with a condition resulting in inadequate cellular metabolism they need to be supplemented with enriched levels of oxygen. *Patients with cellular hypoxia will develop irreversible cell death leading to vital organ failure and ultimately death.*
- High-flow oxygen should NOT be withheld from patients with chronic obstructive pulmonary disease (COPD). These patients also may have sustained significant trauma or other acute medical emergencies that lead to hypoxia and hypo- perfusion. If the respiratory drive becomes inadequate then ventilate the patient with a bag-valve-mask as necessary.
- Supplemental oxygen with a mask or cannula in patients with inadequate minute volume may progress to cellular hypoxia unless the patient is properly ventilated.

BREATHING EMERGENCY: OXYGEN ADMINISTRATION

Supplemental Information (Continued)

Oxygen Source:

- Medical grade oxygen is labeled "Oxygen U.S.P.". This oxygen is more carefully cleaned and refined than commercial types of oxygen.
- To confirm cylinder contains medical grade oxygen:
  - Check color of cylinder - green and white, solid green, or unpainted aluminum with a green ring around top of cylinder
  - Pin index groupings line up with oxygen regulator
- Compressed O_2 tanks for prehospital use come in 4 sizes: "D" and "E" are small and portable; "M" and "H" or sometimes labeled "K" are significantly larger and used on-board the ambulance.
- Never leave cylinders standing in an upright position unless properly secured. Large tanks must be held in place by a chain or metal strip. If cylinder is dropped and the valve breaks off, the cylinder will act as a missile projectile.
  - Portable tanks should be placed on their side on the floor, in a case or other secure carrier. When transporting a patient on a gurney, the cylinder should be secured between the patient's lower legs.

Nasal Cannula

- Nasal cannula is a low-flow, low-oxygen concentration delivery device that delivers 24%-44% of oxygen at flow rates of 1-6 Liters/minute. The patient breathes in room air with the oxygen delivered by the nasal cannula.
- Initial treatment in most patients with mild or moderate respiratory distress.
- Use also for patient who needs oxygen administration but cannot tolerate restrictive feeling of a mask or patient that is vomiting.
- Never place the tubing behind the head since this may decrease the flow of oxygen or the patient may strangle if the cannula slips around the neck.

Medium Concentration Oxygen Mask (Simple Face Mask)

- Consider for patients that do not have adequate improvement for a nasal cannula or who require higher flow rates to meet their oxygen saturation goal.
- Ensure that mask fits properly since leakage around the mask decreases the delivery of oxygen.

High Concentration Oxygen Mask (Non-rebreather Mask)

- Indications - when a patient requires high oxygen concentration.
  - Severe respiratory distress
  - Shock
  - Poor tissue perfusion
  - Carbon monoxide poisoning
  - Traumatic brain injury
  - Inadequate improvement of deterioration despite treatment with nasal cannula or simple face mask
- Assure that there is adequate and uninterrupted oxygen flow to patient or patient may not be able to inhale adequate volume or oxygen needed.
- Never connect the oxygen connector in the mask directly to an endotracheal or tracheostomy tube.
- High flow rates are needed to keep reservoir bag inflated.

Section 5:
Medical

Learn the Facts

You should have a comprehensive understanding of:

- Anatomy & Physiology
- Conditions listed in the index
- Glossary words
- Medical terms listed in each chapter
- Pathophysiology

Understand the Concepts

You should have an extensive understanding of the following:

1. Arteriovenous shunt
2. Complications of renal dialysis
3. Constant evaluation of scene safety
4. Evaluation for causes of an altered mental status with an unknown origin
5. Indications to check a blood glucose level
6. Mechanism of action of Epinephrine
7. Pathophysiology of anaphylaxis
8. Pathophysiology of Diabetic Ketoacidosis (DKA) and its effects on respiratory system
9. Pathophysiology of Sickle Cell Anemia
10. Signs and symptoms of a narcotic overdose
11. Signs and symptoms of DKA
12. Signs and symptoms of meningitis
13. Signs and symptoms of severe dehydration
14. Special considerations for hypothermia
15. Syncope
16. Therapeutic communication

Perform the Skills

Finally, you should be able to:

1. Differentiate between anaphylaxis and allergic reactions
2. Differentiate between seizure phases
3. Evaluate scene safety with a psychiatric population
4. Identify a stroke
5. Recognize hypo/hyperglycemia
6. Treat a patient with a snakebite
7. Treat anaphylaxis
8. Treat for gastrointestinal (GI) bleeding

Medical Patient Assessment

Proctor:		**Student Name:**		**Start Time:**	**End Time:**	
Attempt #:		**Scenario #:**		**Date:**		
BSI:		***Secondary***	APPROPRIATLY ASKED Q'S	***Vitals***	Baseline	Reassessment
P:		**S:**		**B:**		
E:		**O:**		**E:**		
N:		**P:**		**L:**		
M:		**Q:**		**L:**		
A:		**R:**		**S:**		
N:		**S:**		**R:**		
Primary		**T:**		**P:**		
G.I.:		**A:**		**Treatment & Interventions:**		
L.T.:		**M:**		F.A.S.T. Assessment		
AVPU / LOC		**P:**				
C/C:		**L:**				
A:		**E:**				
B:		***Physical***	***Pertinent Body Check of C/C***			
C :	C O P S	**Head:**				
O2 Admin:		**Neck:**		Additional PPE Precautions		
D/D:		**Chest:**				
E:		**Abdominal:**				
F:		**Pelvis:**				
G:	ALS / BLS	**Lower:**				
	CODE: 2 / 3	**Upper:**				
	SPECIALTY / MAR	**Back:**		**Reasses / Report:**		

Final Evaluation (Required):

Proctor Signature:

Mark "X" only if the student did not properly complete the step. Any "X" must be clearly explained in the evaluation

Medical Patient Assessment Pertinent Body Exam

• Cardiovascular

- Chest
  - Visualize; Palpate; Auscultate
    - Masses, scars, lesions, trauma, etc.
- Jugular Venous Pressure (Jugular Vein Distention)
  - Associated Conditions:
    - Right-sided heart failure produces venous hypertension (classic finding)
    - Bradycardia, constrictive pericarditis, IV fluid overload, cardiac tamponade
- Pedal Edema
  - Swelling of the distal portions of the lower extremities
  - Late sign of right-sided heart failure amongst other diseases
- Abdominal Mass
  - Pulsating mass of the abdomen indicates an abdominal aortic aneurysm (AAA)
- Lung Sounds
  - Pulmonary edema may indicate left-sided heart failure
- Associated Respiratory Distress
  - Indicates respiratory condition. Follow up with respiratory examination
  - Chest pain felt only during inspiration may be due to a pulmonary embolism.

• Respiratory

- Chest
  - Visualize; Palpate; Auscultate
- PASTE
  - Position (Tripod, etc.)
  - Associated chest pain/Accessory muscle use
    - Chest pain indicates cardiac condition. Follow up with cardiovascular examination
  - Sputum (Color, amount)
    - Pink frothy sputum indicates the presence of plasma (liquid portion of blood) in the lungs
  - Talking (Short sentences)
  - Exercise Tolerance (Compared to normal value)
- Lung Sounds
  - Rales
    - "Popping" open of small airways and alveoli after collapse
    - Associated Conditions:
      - Pneumonia, atelectasis, pulmonary fibrosis, acute bronchitis, pulmonary edema (secondary to left-sided congestive heart failure)
  - Rhonchi
    - "Coarse" rattling sounds similar to snoring. Caused by secretion of mucus in bronchial tubes
    - Associated Conditions:
      - Indicative of bronchitis
  - Wheezes
    - "Whistling" sound produced during respiration due to the narrowing of the respiratory tract
    - Associated Conditions:
      - Asthma, chronic obstructive pulmonary disease, hypersensitivity (medication) induced bronchoconstriction, pulmonary edema, vocal cord dysfunction, anaphylaxis
  - Stridor
    - High-pitched sound resulting from obstructed flow in the upper airway
    - Associated Conditions:
      - Epiglottitis, croup, foreign body aspiration, tumor formation, edema
- Skin Signs/Extremities
  - Cyanosis (Hypoxia)

CHEST PAIN/DISCOMFORT OPQRST

O – Onset	Did this discomfort come on suddenly or gradually?
P – Provoke/Palliative	Is there anything that you do that makes this discomfort better or worse?
Q – Quality	How would you describe this discomfort? You can insert the word the patient used in place of "discomfort". Some patients will describe the discomfort as pain, pressure, heaviness, etc.
R – Radiation	Can you point to where the discomfort is? Does the discomfort stay there or does it move? Do you have discomfort anywhere else?
S – Severity	On a scale of 1-10, one being no pain at all and ten being the worst pain you have ever had, how would you rate the pain. Is this worst now than when it began?
T – Time	What time did this episode begin? Has anything like this ever happened to you before and if so when?
Associated Systems	I understand that you have chest discomfort. Did you get light-headed, sweaty, or nauseous when this happened? Do you have any shortness of breath?

RESPIRATORY OPQRST

O – Onset	Did this breathing difficulty come on suddenly or gradually?
P – Provoke/Palliative	Is there anything that you do that makes this breathing difficulty better or worse?
Q – Quality	How would you describe this breathing difficulty? You can insert the word the patient used in place of "difficulty breathing". Some patients will describe tightness, can't breathe, pressure, etc. Do you have a hard time getting air in, air out or both?
R – Radiation	Do you have any chest pain or discomfort with this difficulty breathing?
S – Severity	On a scale of 1-10, one being no breathing difficulty at all and ten being the worst the worst episode you have ever had, how would you rate the breathing difficulty? Is this worst now than when it began? Have you every been hospitalized or intubated for this.
T – Time	What time did this episode begin? Has anything like this ever happened to you before and if so when?
Associated Systems	I understand that you're having difficulty breathing. Do you have a cough with this and if so is there anything coming up when you cough? What color is it? Any night sweats, fever or chills? Do you smoke? (Packs per day/year)

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

ASSESSMENT & MANAGEMENT FOR A MEDICAL PATIENT

PERFORMANCE OBJECTIVES
Demonstrate competency in performing a complete medical assessment involving scene size-up, primary assessment, secondary assessment, physical examination, ongoing assessment, and perform life-threatening interventions as necessary.

CONDITION
Perform a medical assessment on a simulated patient and perform life-threatening interventions as necessary. Necessary equipment will be adjacent to the patient or brought to the field setting.

EQUIPMENT
Live model or manikin, oxygen tank with flow meter, oxygen tubing, BMV device, oxygen mask, nasal cannula, stethoscope, blood pressure cuff, pen light, timing device, clipboard, pen, goggles, various masks, gown, gloves, airway bag.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.
- Patient assessment and management of life-threatening interventions must be completed within 10 minutes.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions	• Mandatory (minimal) personal protective equipment – gloves.

SCENE SIZE-UP Critical Decisions	
Skill Component	**Key Concepts**
♦ Assess the scene: • Personnel/patient safety • Environmental hazards • Number of patients • Nature of illness	• The initial information obtained from the nature of illness assists in formulating the field impression.
♦ Determine the need for: • Additional resources • Specialized equipment • Additional BSI – *if indicated*	• The need for additional resources may include additional equipment, ambulances, or helicopters. • Specialized equipment may include the use of a bariatric stretcher or ambulance. • Additional BSI is indicated if the patient is actively bleeding or you have determined that the patient may have a communicable disease. • Situational - goggles, mask, gown

PRIMARY ASSESSMENT (Initial Assessment)	
Skill Component	**Key Concepts**
♦ Formulate a general impression of the patient: • General impression - Stable • Imminent Life-threatening condition – Unstable • Observe for major disabilities - Unstable	• The general impression is determined by observing the appearance and hygiene, patient position, sounds, and smells. It establishes the overall condition of the patient, and if immediate life threats exist, or if are immediate interventions are needed. Does the patient appear stable, potentially unstable, or unstable? • The primary assessment should be completed within 60 – 90 seconds.

	Continued… • Stop, and manage life-threatening situations when identified • The patient's condition may change at any time. EMS providers must re-assess and manage any changes in the patient's condition. **NOTE:** The patient's condition may change at any time. EMS providers must re-assess and manage any changes in the patient's condition.
Skill Component	**Key Concepts**
♦ Establish patient rapport – *if patient is responsive* • Introduce yourself to the patient and/or caregiver • Ask the patient's name • Ask why EMS was called (preliminary chief complaint of the patient) • Obtain permission to treat • Respond with empathy • Use positive body language	• The overall situation and patient condition will determine the level of rapport that is possible. • Establishing a positive rapport assists with decreasing the patient's anxiety and promotes a greater degree of cooperation. • Determining the reason that EMS was called assists with determining the preliminary chief complaint and ultimately the provider impression. • Responding with empathy develops trust and encourages effective patient communication. • Patients have the right to be treated with respect. Care and treatment should be delivered in a non-judgmental and impartial manner. • Positive body language refers to facial expressions, gestures, and body movements that are used to communicate a variety of messages to the patient by the healthcare provider; (i.e. caring words, providing encouragement, and performing interventions competently).
♦ Assess the mental status/stimulus response (AVPU): • **A**lert • **V**erbal stimulus • **P**ainful (noxious) stimulus • **U**nresponsive	• During the primary assessment, only the patient's response to environmental stimuli is determined. This is **NOT** the time to obtain a comprehensive orientation level. • The least amount of stimuli should be used to determine mental status.
IF UNRESPONSIVE GO TO CPR AND AED SKILLS	
Skill Component	**Key Concepts**
♦ Explain the care being delivered to the patient	• Communication is important when dealing with the patient, family, or caregiver. This is a very critical and frightening time for all involved and providing information helps in decrease anxiety
♦ Assess the **airway**: • Patent • Obstructed	• Noisy breathing is obstructed breathing. • If the airway appears obstructed, go to Adult Obstructed Airway skill. • Open the airway and assess for the presence of a foreign body such as food, gum, etc., if indicated. If it can be removed easily, remove it.
♦ Manage the **airway** and life threatening situations– if indicated ***Open and clear/suction airway - if indicated*** ***Utilize basic airway adjuncts - if indicated*** ***Initiate immediate transport – if unable to Open the airway***	• Insert nasopharyngeal (NP) airway for either responsive or unresponsive patients. NP airways are contraindicated in pediatric patients < 12 months of age. • Use Insert an oropharyngeal (OP) airway for the unresponsive patient with no gag reflex. • Immediate transport should be initiated if unable to establish or maintain an adequate airway.
♦ Determine if the airway is manageable vs. unmanageable	• A patient has a manageable airway if: - breathing adequately through a patent airway - ventilation is effective using positive pressure ventilation using a bag-mask-ventilation (BMV) device. • A patient has an unmanageable airway if: - Patient cannot breathe on their own - Patient cannot be ventilated with a BMV

Skill Component	Key Concepts
♦ Assess **breathing**: • Rate (fast, slow, normal or absent) • Rhythm (regular, irregular) • Quality (air movement, chest expansion) • Depth (tidal volume) • Rapid chest auscultation - *if difficulty breathing, shortness of breath, and chest trauma*	• Visualize chest and signs of inadequate breathing. • The initial respiratory rate should not be counted at this time, but only observed if it is too fast, too slow or in the normal range. • Abnormal rates may not provide adequate ventilations or tidal volume. Use BMV to increase tidal volume or rate if necessary, especially if level of consciousness is decreased. • Administer O2 therapy if vital organs are at risk for hypo-perfusion. • When rapid chest auscultation is indicated, auscultate for the presence and equality in *2 locations only* (5^{th}-6^{th} intercostal space, mid-axillary line) bilaterally.
♦ Manage **breathing** – if indicated ***Applies oxygen – if indicated per Los Angeles County EMS Agency Reference No. 1302* ** *Deliver positive pressure ventilations (PPV) – if Indicated* ***Transport immediately if unable to manage ventilations*	• The indications for the use of PPV include: - Agonal - Apnea - Decreased tidal volume in a patient with an altered mental status (AMS) - Bradypnea - < 8 breaths/minute and AMS - Tachypnea > 30 breaths/minute and AMS • A goal of oxygen administration is to deliver the minimum amount of oxygen to meet the needs of the patient and to maintain an oxygen saturation level at or above 94-98%. • When available, use pulse oximetry to guide oxygen delivery. • **SPECIAL CONSIDERATION:** For chronic obstructive pulmonary disease (COPD), the goal is to titrate oxygen to keep the SpO_2 at 88-92%.
♦ State the indications for immediate high-flow (15L/min) oxygen administration: • Respiratory Arrest • Cardiac Arrest • Shock/Poor Perfusion • Anaphylaxis • Traumatic Brain Injury • Carbon Monoxide Poisoning • Suspected Pneumothorax	• Hypoventilation results in high arterial carbon dioxide (CO_2). level, which has a harmful effect on the body.
♦ Assess the **circulation**: (mnemonic **COPS**) • **C**apillary refill - *if appropriate* • **O**bvious external bleeding • **P**ulse – normal, too fast, too slow or absent • **S**kin - color, temperature, moisture	• Check the radial and carotid pulses at same time in critical situations. Check the femoral pulse if unable to obtain a carotid pulse. The radial pulse may be absent due to decreased blood pressure. • Capillary refill is most accurate in pediatric patients. It is **NOT** always accurate in adults due to chronically poor peripheral circulation. It is not accurate in cold environments. • Capillary refill can be assessed at any skin area such as fingernail bed, palm of the hand, chest, forehead, etc. If you will be using the ball of the foot in a pediatric patient, the child must be in a supine position. The most accurate site to check capillary refill is a central site (chest wall) vs. a peripheral site.
♦ Manage the **circulation** and life threatening situations: • ***If internal bleeding is suspected:*** - ***Place the patient in supine position - if signs of hypo-perfusion is suspected*** - ***Initiate immediate transport – if the patient shows signs of deterioration***	• Internal bleeding is not typically controlled in the field. Surgical intervention is usually required to stop the bleeding. • If ALS is on scene, venous access should be attempted and the patient should be placed on a cardiac monitor. • A repeat set of vital signs should be taken and monitored for trends. If there are signs and symptoms of deterioration, the patient should be transported ASAP to the MAR. • When a life-threatening condition exists, EMTs must use their judgement to determine when the patient should be transported. If the ETA for the responding ALS unit exceeds the ETA to the most accessible receiving facility (MAR), they may transport the patient by BLS. See Reference No. 502.

Skill Component	Key Concepts
♦ Observe for deformities and **disabilities**: • Neurological deficits • Abnormal body positioning	• While observing for deformities, ask a conscious patient if they had any pre-existing disabilities. (If the patient is unable to move their lower extremities, this may have been from a previous injury). • Neurological deficits include: facial droop, slurred speech, paresthesia, and paralysis. • Abnormal body presentations include tripod position, decerebrate, decorticate posturing, or contractures due to prolonged immobility.
♦ Expose and visualize the area the area associated with the preliminary medical complaint.	• The preliminary complaint is the reason for summoning EMS to the scene. • While exposing the area associated with the preliminary complaint, maintain the patient's privacy as best as possible. • If the patient is unresponsive, remove the patient's clothing and cover with a sheet or blanket.
♦ Form a field impression ***Obtain a blood glucose level - if altered level of consciousness*** ***Manage any life-threatening situations - if not already addressed***	• A field impression is formed based upon all of the information gathered by EMS personnel up until this point. It utilizes all information gathered earlier in the assessment. At this point, a determination is made as to whether the patient is a stable or unstable patient. Ask yourself: Does the patient have a serious illness that requires prompt transport of does the patient have a minor illness that is **NOT** life threatening?
♦ Determine transport options: • Level of transport ALS/ BLS • Mode of transport • Destination	• In life threatening situations (e.g. unmanageable airway or uncontrollable hemorrhage) in which the estimated time of arrival (ETA) of the paramedics exceeds the ETA to the most accessible receiving (MAR) facility, EMTs should exercise their clinical judgment as to whether it is in the patient's best interest to be transported prior to the arrival of ALS. • Medical patients should be assessed and treated on scene before being transported. • Mode of transport incorporates ground and air transport. • ALS and BLS providers should transport to the appropriate facility as indicated.

SECONDARY ASSESSMENT
(Focused History and Physical Examination)

Skill Component	Key Concepts
♦ Assess the current chief complaint of the patient: **SAMPLE History Assessment** • **S**igns/**S**ymptoms - **OPQRST** for current complaint • **A**llergies • **M**edications • **P**ertinent history - age - weight - under physician's care/private medical doctor - pertinent medical/surgical history • **L**ast oral intake (last meal or when medication taken) - *if pertinent* ***OR*** **L**ast menstrual period • **E**vent leading to injury	• Assessing the current chief complaint assists with identifying the current illness. • The age for pediatrics in Los Angeles County is 14 and under. • The pediatric emergency resuscitation tape shall be used to obtaining an infant's or a child's weight, and dosages of pain medications in all children 14 and under. • **OPQRST** is a mnemonic used to assess pain and shortness of breath. **It should only be used with a patient who is conscious and fully oriented.** - **O**nset – What caused this pain to occur? What was the patient doing at the time this pain started? Was the onset gradual or rapid? - **P**rovokes – What makes it worse? **P**alliative – What makes it better? **P**osition – What position is the patient found in? - **Q**uality – How does the patient describe the pain? (Burning, stabbing, crushing, dull, heaviness). Is the pain constant or intermittent? - **R**egion – area involved, **R**adiation – does the pain/discomfort spread from origin, **R**ecurrence – has this occurred before - **T**ime – when did the problem/pain begin and what is the duration of time - **S**everity – pain scale (0-10) 10 being the worst pain.

	Continued… • Obtaining information such as whether the patient is under a physician care and the name of primary medical doctor or health plan assists with determining the patient's medical history and transport destination. If the patient is unable to speak, o*btain information from family or bystanders* • A pertinent medical history refers to past medical history that is relevant to the chief complaint/problem such as a heart condition, pulmonary problems, hypertension, diabetes, CVA, syncopal episode, or recent surgery. • The last oral intake is important when there is a possibility that the patient may require surgery or if there is a potential for aspiration.
Skill Component	**Key Concepts**
♦ Verbalize the appropriate level of assessment that is required • **Unstable patients** – Perform a rapid medical assessment, while enroute • **Stable patients:** – Focused exam of the area associated with the chief complaint, while on scene	• The purpose of performing a physical exam during the secondary assessment is to look for the presence of hidden issues that may compromise the patient's condition and warrant more definitive care. • Performing a logical and systematic physical assessment of the patient may only focus on a certain area or body region based upon the statements made by a conscious patient. • Scene circumstances and patient presentation may dictate the level of the assessment performed while on scene or enroute. • For unconscious/unresponsive /unstable patients, perform a rapid trauma assessment (head to toe). • A rapid trauma assessment is a brief inspection and palpation of the body. It reveals life-threatening injuries which must be treated immediately and require rapid transport. A rapid medical assessment includes all **DCAP BTLS TIC** elements and must be performed as quickly as possible or take no long loner than 60-90 seconds. • The information/observations you obtained during the primary assessment determine which type of physical exam is needed during the secondary assessment (rapid vs. slower). • If the patient is deemed "stable" and has a minor illness, you may perform an assessment while still on scene. • A stable patient is defined as having vital signs within normal limits; the patient is conscious and comfortable. • If the patient is deemed to be unstable, perform a rapid medical (head to toe) exam. • A patient is considered unstable if the assessment reveals an immediate threat to life i.e. vital signs that are abnormal and S/S of shock. • If the patient has a minor illness, perform a slower, focused exam of the particular body region that is associated with initial complaint. • The secondary assessment allows you to obtain additional information in order to determine and establish priorities for treatment. Other options must always be considered. • Changes in the patient's condition may require additional assessment parameters.

Skill Component	Key Concepts
♦ Performs a detailed head to toe exam of each body region and assess **DCAP/BTLS TIC** • head • pelvis • neck • lower extremities • chest • upper extremities • abdomen • back • **D**eformity (visible and palpated) • **C**ontusions • **A**brasions • **P**enetrations / Punctures • **B**urns / Bruises • **T**enderness • **L**acerations • **S**welling / Scars Continued… ♦ **Palpate for**: • **T**enderness • **I**nstability • **C**repitus	• The purpose of performing a physical exam during the secondary assessment is to look for the presence of hidden findings that may compromise the patient's condition and warrant more definitive care. • Performing a logical and systematic physical assessment of the patient may only focus on a certain area or body region based upon the statements made by a conscious patient. • Scene circumstances and patient presentation may dictate the level of the assessment performed while on scene or enroute. • For unconscious/unresponsive patients, perform a rapid medical assessment (head to toe). • Definition of Crepitus: - grating of bone fragments - crackling of joints - air or gas in soft tissue (subcutaneous emphysema) **NOTE:** • For an unconscious patient or a focused medical complaint, i.e. chest pain, assess the chest region by **visualizing** and then **palpating the chest.**
♦ Assess the **HEAD - Skull, Eyes, Ears, Nose, Mouth, and Face** **Additional Assessment Elements:** • Asymmetry of head and face • Drainage • Evidence of coffee ground emesis **Medical Devices**: • Nasogastric Tube (NG)	• **Adults** – Using a head-to-toe approach for examination works the best. • **Children** – Using a toe-to-head approach for examination works the best for gaining the child's confidence. • Asymmetry of the head and face may be due to a medical problem such as stoke or Bell's Palsy (unilateral facial paralysis of sudden onset and unknown cause). • Coffee ground emesis is partially digested blood found with upper GI bleeding (stomach). It looks like wet coffee grounds and may be found on, around the patient's mouth, or in an emesis basin.
♦ Assess the **NECK/CERVICAL SPINE** **Additional Assessment Elements:** • Track marks and tattoos • Jugular vein distention (JVD) • Tracheal deviation • Accessory muscle use (AMU) • Carotid pulses • Subcutaneous emphysema (SE) or (crepitus) • Stoma **Medical Devices**: • Tracheostomy • Central venous catheters • Medical alert tags	• **DO NOT** assess for carotid pulses on the right and left side at the same time. Palpating both carotid arteries at the same time simultaneously may limit the blood supply to the brain. • The presence of a medical alert tag may provide information related to whether the patient is allergic to any medications or suffers from a significant medical condition. • Tracheal deviation is a very late sign that may **NOT** be visualized in the field. • AMU may include the sternocleidomastoid and scalene muscles (anterior, middle, and posterior). The use of accessory muscle use while at rest is a sign of respiratory distress that must be addressed. • SE is when gas or air is trapped under the layers of the skin and can only be identified by palpation of the body region. Upon palpation, SE is represented by a crackling feeling that has been described as compressing Rice Krispies. It occurs as the result of rupture/disruption of respiratory structures. It most commonly appears under the skin covering the chest and neck but may also appear in any body area. SE may progress into a life threatening condition. • A stoma is an opening in the anterior neck through which the patient breathes. A stoma is created when a patient has had an advanced airway in place and is ventilator dependent for a long period. A stoma may be temporary or permanent depending upon the nature of the illness. • A tracheostomy tube is placed in the stoma and the ventilator connects to the universal 15mm adapter.

Skill Component	Key Concepts
♦ Assess the **CHEST – Clavicles, Sternum, Ribs** **Additional Assessment Elements:** • Paradoxical respirations/movement • Accessory muscle use • Sucking chest wound • Subcutaneous emphysema (crepitus) **Auscultate**: • Breath sounds in all lung fields **Medical Devices**: • Pacemaker • Internal cardiac defibrillator (ICD) • Central catheters • Chest tubes	• Paradoxical chest wall motion or paradoxical respiration is a type of breathing that occurs when a part of the lung inflates during inspiration and causes ballooning out of the chest during exhalation. It is most commonly associated with blunt chest trauma, which results in a flail chest. However, if paradoxical movement of the chest is noted in the absence of trauma, the patient may be suffering from a spontaneous pneumothorax or have a congenital abnormality. • An attempt to maintain patient modesty when performing chest palpation/auscultation should always be made. • At this time, lung sounds should be assessed in all fields, if possible. • While assessing the chest, also determine if the patient has a pacemaker or an internal cardiac defibrillator (ICD). • The presence of a pre-existing vascular access device indicates that the patient is being treated for some type of illness/condition. • EMTs may not transport a patient if a chest tube is in place. • In the medical patient an assessment finding of subcutaneous emphysema (crepitus) indicates the patient has developed gas gangrene (potentially deadly form of tissue death). It is caused by an anaerobic microorganism infection at the site of a recent surgical or traumatic wound. Gas gangrene develops rapidly and is often fatal.
♦ Assess the **ABDOMEN (DR GERM)** **Additional Assessment Elements:** • **D**istention • **R**igidity • **G**uarding • **E**cchymosis • **R**ebound tenderness • Pulsating **M**ass • Signs of pregnancy and/or complications • Subcutaneous emphysema (crepitus) **Medical Devices**: • Gastrostomy tube • Colostomy/Ostomy • Medication pumps (insulin pump) • Suprapubic catheters • Urostomy tubes	• The presence of a pulsating mass in the abdomen may indicate the presence of an aneurysm. **DO NOT PALPATE** the area as this may cause the aneurysm to rupture. • EMS providers should palpate each of the 4 quadrants one time only to assess for rigidity and guarding. If the patient is complaining of abdominal pain, begin palpating the quadrant furthest away from the pain. • Use finger pads of the first 3 fingers to palpate the abdomen. **DO NOT** use finger tips. • Rebound tenderness should not be assessed in the field. It causes severe pain and prehospital treatment does not change. It is a diagnostic sign-for testing for peritoneal irritation caused by infection or internal bleeding. • Guarding is the reflexive tightening of abdominal muscles as the depth of palpation is increased.
♦ Assess the **PELVIS** **Additional Assessment Elements:** • Femoral pulses • Incontinence • Priapism • Signs of pregnancy and/or complications • Vaginal bleeding **Medical Devices**: • Urinary catheter • Drains	• **DO NOT** rock the pelvis or compress the iliac crests. The presence of back and abdominal pain is used to assess the pelvis without palpation. • Palpating femoral pulses is useful in the elderly if circulation to extremities is diminished. Maintain modesty and dignity while palpating and examining the pelvis. • Pregnancy related complications are; contractions, vaginal bleeding, rigid abdomen, back pain, etc. • Priapism is a prolonged painful penile erection not associated with sexual stimulation. It may be caused by: - blood disorders such as Sickle Cell anemia and leukemia - prescription medications used for erectile dysfunction, antidepressants, psychiatric disorders, anti-anxiety and blood thinners - illicit or recreational drugs - spinal cord lesions - spinal cord trauma

Skill Component	Key Concepts
♦ Assess the **LOWER EXTREMITIES** **Additional Assessment Elements:** • Track marks • Redness and tenderness • Pedal pulses • Motor movement and function • Sensation • Pedal Edema **Medical Devices**: • IV catheters • Drains • Medical alert tags	• Compare bilateral pulses, motor movement, and sensation. • Tenderness in the calf may indicate deep vein thrombosis. It should be assessed if the patient is complaining of shortness of breath, chest pain, or signs of a stroke. Deep vein thrombosis may indicate migration of a clot to the lungs, coronary arteries, or brain. • Abnormal sensations may be tingling, burning or numbness • The presence of a medical alert tag may provide information related to whether the patient is allergic to any medications or suffers from a significant medical condition. • Pedal edema is swelling of the feet and ankles and may signify the presence of a pre-existing medical condition.
♦ Assess the **UPPER EXTREMITIES** **Additional Assessment Elements:** • Tract marks • Brachial/radial pulses • Motor movement and function • Sensation **Medical Devices**: • Arteriovenous (AV) shunt or fistula • IV catheters • Medical alert tags	• Compare bilateral pulses, motor movement, and sensation. • Abnormal sensations may be tingling, burning or numbness. • Arteriovenous (AV) shunts, or fistulas connect an artery to a vein and is used for dialysis.
♦ Assess the **BACK - Posterior Thorax, Lumbar, Buttocks** **Additional Assessment Elements:** • Tattoos • Posterior lung sounds • Subcutaneous emphysema (crepitus) • Sacral edema • Decubitus ulcers	• Assess breath sounds in all posterior locations. • The presence of decubitus ulcers indicates patient immobility and/or neglect. • In a Skilled Nursing Facility (SNF), the presence of decubitus ulcers is a reportable finding.
♦ Assess the vital signs: • Cardiac status - pulse - rate, rhythm, quality • Respiratory status - respirations - rate, effort, tidal volume - breath sounds - oxygen saturation SpO_2% (Pulse oximetry - *if available* • Blood pressure (systolic and diastolic) • Skin signs - color - temperature - moisture • Pain ** ***Re-evaluate the effectiveness of all primary assessment interventions performed - if applicable***	• A complete set of vital signs are taken and counted at this time. • The SpO_2 reading must be documented on the EMS Report or ePCR. • The pulse oximetry device measures the amount of hemoglobin that is saturated with oxygen. • When rapid chest auscultation is **NOT** indicated, auscultate for the presence and equality in *all lung fields* • When assessing a blood pressure on the patient, determine both a systolic and diastolic B/P by using the auscultation method. The palpation method only measures the systolic blood pressure. The only time the palpation method is appropriate is if you are unable to hear the pulsations when attempting to auscultate. • Palpating a blood pressure in order to save time is **NOT** acceptable as the palpation method does not provide a diastolic blood pressure, which is necessary to determine the presence of significant medical conditions such as a rise in intracranial pressure. • An evaluation of the condition of the skin involves assessment of color, temperature, and moisture. • All patients must be assessed for presence and absence of pain. Document what patient states the pain level is using the 0 - 10 scale. (0 = no pain, 10 = excruciating pain). EMS providers explain what the scale represents in order to receive an accurate rating from the patient. Prehospital providers **MUST** document what the patient states and not the provider's perception of the pain level.

Skill Component	Key Concepts
♦ Examine the neurological status: ***Determine a comprehensive orientation level: Person, place, time, or event*** ***Determine a Glasgow Coma Scale (GCS) score- eyes, verbal, motor*** ***Evaluate the pupils – equal size, round, react to light (PERRL) and movement - <u>if indicated</u>*** • Extremities-circulation, movement, strength, sensation ***Perform a finger stick blood sugar check – if indicated***	• Comprehensive orientation level involves three (3) parameters: Person, place, time, or event. • Glasgow Coma Scale (GCS) is a numerical rating for assessing the eyes, verbal, and motor responses of the patient. • Neuro symptoms described by the patient may include headache, blurred vision, photophobia, dizziness, paresthesia, etc. • Assess each extremity individually and then compare findings. • The indications for a glucose check are: the patient has a history of diabetes and has an altered mental status. **See Los Angeles County Skill Sheet "Finger Stick Blood Glucose Testing."** • Hypoglycemia is defined as a blood sugar < 60mg/dL
♦ Re-evaluate transport decision to appropriate facility	• See Reference No(s). 502, 506, 508, 510, 511, 512, 513, 515, 518, 521.
♦ Determines a primary "Provider Impression"	• Provider Impressions are mandatory for all ALS and BLS providers in California. • Provider Impressions **ARE NOT** a diagnosis; it is your impression, based on your assessment of the patient, which guides your choice of treatment. It can change depending upon additional assessment information gained. • Conveying the initial impression of the patient to ALS and the receiving hospital personnel improves patient care by helping to guide treatment and clarify decision-making. • Each patient encounter begins by utilizing a structured approach to completing a patient assessment. Determining the chief complaint leads to an assessment. The assessment then leads to formulating a "Provider Impression." • The provider impression drives the treatment that should be implemented (management decisions). • Provider impressions were mandated by the State and local EMS Agencies have now begun to implement them in their everyday practice. • Some provider impressions are broad and require further clarification in EMS documentation. For example, if a medical patient is unconscious, unresponsive, and pulseless, the provider impression is Cardiac Arrest – Non-Traumatic.

RE-ASSESSMENT/DOCUMENTATION
(Ongoing Assessment)

Skill Component	Key Concepts
§ Re-assess a patient at least every **5 minutes for priority** patients and every **15 minutes for stable** patients. • Primary assessment • Relevant portion of the secondary assessment • Vital signs: Blood pressure, pulse and respirations ***Manage patient condition as indicated.***	• Unstable patients have abnormal vital signs, S/S of poor perfusion, there is a suspicion that the patient's condition may deteriorate, or when the patient's condition changes. • Evaluating and comparing prior assessment findings assists with recognizing if the patient is improving, responding to treatment, or if their condition is deteriorating. • Patients must be re-evaluated at least every 5 minutes if any treatment was initiated or medication administered.

Skill Component	Key Concepts
§ Continue O2 therapy, if indicated, until the transfer of patient care has occurred	• Once oxygen therapy has been initiated, it should **NOT BE** discontinued until the transfer of patient care has occurred.
§ Give patient report to equal or higher level of care provider **Exception**: *Report may be given to a lower level of care provider when an ALS to BLS downgrade has occurred*	• Report should consist of all pertinent information regarding the assessment findings, treatment rendered and patients response to care provided.

Developed 11/99: Revised 11/2018

PATIENT ASSESSMENT & MANAGEMENT
Supplemental Information

NOTES:

- The preliminary chief-complaint is the reason for summoning EMS to the scene.
- The general impression is determined by EMS personnel utilizing information gathered early in the assessment.
- A patient with a respiratory rate is outside of the normal range and has inadequate tidal volume accompanied by altered level of consciousness and abnormal skin signs needs positive pressure ventilation with a BMV.
- Capillary refill can be taken at any skin area such as fingernail bed, palm of the hand, chest, forehead, etc. If using the ball of the foot in pediatric patients, the child must be in a supine position. The most accurate site is a central site, such as the chest wall rather than a peripheral site.
- Medical conditions can be evaluated by using the mnemonic OPQRST: OPQRST is a mnemonic used to assess pain and shortness of breath. **It should only be used with a patient who is conscious and fully oriented.**
- Glasgow Coma Scale (GCS): Eye Opening (awake or unresponsive), verbal response, motor response (Normal 4-5-6)

Eye Opening	Verbal Response	Motor Response
• Stimuli needed for patient to open eyes	• Best communication when questioned	• Best response to command or stimulus
4 = spontaneous 3 = responds to voice 2 = responds only to painful stimuli 1 = no response	5 = oriented , converses normally 4 = confused, disoriented 3 = inappropriate words or phrases 2 = incomprehensible sounds 1 = makes no sound	6 = obeys commands 5 = localizes stimulus (purposeful) 4 = flexion, withdraws from stimulus 3 = abnormal flexion (spastic) (*decorticate posturing)* 2 = extension (rigid) (*decerebrate posturing*) 1 = makes no movement

COMPONENTS OF AN AIRWAY BAG:	
BMV devices – adult, child, infant	**Portable suction**
OP/NP airways – all sizes	**Suction equipment– various sizes**
Nasal cannula	**Portable oxygen cylinder and oxygen regulator**
Simple face mask – adult, child, and infants	**Pulse Oximeter**
Non-rebreather – adult, child, and infants	**Water soluble lubricant**

PERTINENT CHIEF COMPLAINT QUESTIONS:

ABDOMINAL DISCOMFORT / NAUSEA / VOMITING / DIARRHEA

- Causative event and if acute or chronic
- Time of onset
- Duration of event
- Type of expelled GI contents (coffee ground emesis, hemoptysis, bile, melena [black tarry] or hematochezia [bright red bloody] stool, etc.)
- Amount and frequency of expelled GI contents
- Skin temperature/fever
- Pain/discomfort
- Skin color
- Signs of dehydration (skin turgor/tenting, absence of tearing, decreased urinary output, and quality of pulse)

ALLERGIC REACTION / ANAPHYLAXIS / ENVIRONMENTAL EMERGENCY

- Causative event (allergy, heat, cold, water, or altitude)
- Type of substance
- Exposure (ingestion, inhalation, absorption, envenomation, injection)
- Duration of exposure
- General vs. local effect (rash, hives, itching, respiratory problems, nausea, vomiting, etc)
- Progression of symptoms
- Treatment initiated prior to EMS
- Response to treatment prior to EMS

PATIENT ASSESSMENT & MANAGEMENT
Supplemental Information

ALTERED LEVEL OF CONSCIOUSNESS / SEIZURE / WEAKNESS / DIZZINESS / SYNCOPE

- Causative event and if acute or chronic
- Time of onset
- Duration of event
- Orientation level (name, place, and time)
- Associated symptoms (neuro deficits, pupil response)
- Position found in
- Length of time unconscious
- Incontinence
- Dysrhythmia
- The possible causes are: (not all inclusive)
  - **A** alcohol, anoxia, allergic reaction, arrhythmia (dysrhythmia)
  - **E** epilepsy, electrolyte imbalance
  - **I** insulin (hyper-hypo glycemia)
  - **O** overdose
  - **U** uremia, under-dose
  - **T** trauma
  - **I** infection
  - **P** psychiatric, post-ictal, poisoning (ingestion, inhalation), palpitation (dysrhythmias)
  - **S** stroke

BEHAVIORAL EMERGENCY

- Causative event (medical, psychiatric, traumatic event)
- Compliance with medications
- Type of behavior (danger to self or others)

FEVER

- History of fever (highest temperature and latest reading)
- Associated signs/symptoms (nausea, vomiting, diarrhea, pain, cough, urinary symptoms, stiff neck)
- Measures taken to reduce fever (last dose of fever reduction medications such as ibuprofen or acetaminophen

OBSTETRICAL / GYNECOLOGICAL EMERGENCY

- Last menstrual period and due date
- Type of birth control used
- Bleeding / discharge / amniotic fluid (rupture of membranes [ROM]) - color, odor, amount (number of saturated pads)
- Pregnant - how far along, number of pregnancies and births
- Prenatal care and anticipated complications
- Multiple births (twins, etc.) expected
- Pain/discomfort - duration, (constant vs. intermittent)
- Labor - time and length of contractions, crowning, urge to push
- Use of legal or illegal substances

VAGINAL BLEEDING

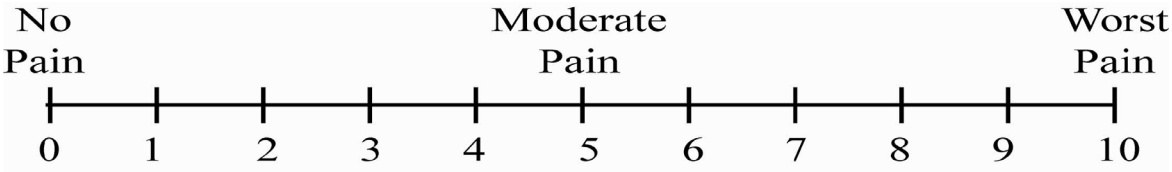
- Precipitating event
- Time of onset
- Duration of event
- Last normal menstrual period (LNMP)
- Pregnant (how far along)
- Pain/cramping
- Amount of bleeding (number of saturated pads/hour)
- Passing blood clots/tissue
- Nausea, vomiting
- Dizziness

PATIENT ASSESSMENT & MANAGEMENT
Supplemental Information

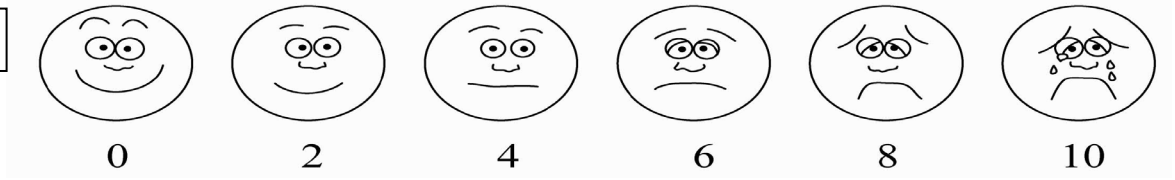
PAIN / DISCOMFORT

- When did the pain/discomfort first began (minutes - weeks) and if acute or chronic
- Causative event; what makes it better or worse?
- Type of pain, i.e. sharp, ache, squeezing, burning, etc.
- Area effected and if focal or diffuse
- Pain moves to another area away from its origin
- Constant or intermittent
- 0 - 10 pain scale (initial event and ongoing assessment)
- Duration

Adults



Pediatrics



- Type of substance
- Quantity and route of exposure (ingestion, inhalation, absorption, injection)
- Time of exposure
- Effect (altered level of consciousness, respiratory problems, abdominal pain/discomfort, nausea, vomiting, etc)
- Progression of symptoms
- Care rendered prior to EMS
- Response to treatment prior to EMS

RESPIRATORY DISTRESS

- When distress first began, gradual vs. sudden, and if acute or chronic
- Causative event (allergy, exertion, drugs, etc) and what makes it better or worse
- Effective ventilations, tidal volume, difficulty getting air in or air out, accessory muscle use, stridor, position, etc.
- Rate fast, slow, normal, and respiratory pattern
- Initial or repeated episodes, time of last episode
- Rate the severity using mild, moderate, or severe and compare to previous episode or ongoing assessment
- Duration

Distress level considerations for chief complaint of shortness of breath (SOB)

SHORTNESS OF BREATH SEVERITY SCALE			
S/S	Mild	Moderate	Severe
Dyspnea	When walking	When talking	At rest,
Ability to speak	Full sentences	Phrases or partial sentences	Single words
Heart Rate	Borderline Tachycardia	100-120bpm	>120bpm
Respiratory Rate	Tachypnea	Tachypnea	>30/min
Breath Sounds	Mild wheezes at the end expiration	Throughout expiration	Inspiration and expiration
Accessory Muscle use	None	Common	All
Mental Status	Anxious	Agitation	Drowsy to agitated
Body Position	Normal posture	Sits upright	Tripod position
Skin Signs	Normal – warm, normal color, dry	Cool, pale,dry,	Cool, pale, moist (diaphoretic)

(Emergency Care 11th edition, Mistovich 2018)

REFERENCES

- 502 - Patient Destination
- 506 - Trauma Triage
- 508 - Sexual Assault Patient Destination
- 510 - Pediatric Patient Destination
- 511 - Perinatal Patient Destination
- 512 - Burn Patient Destination
- 513 - ST Elevation Myocardial Infarction Patient Destination
- 515 - Air Ambulance Trauma Transport
- 518 – Decompression Emergencies/Patient Destination
- 519 - Management of Multiple Casualty Incidents
- 521 - Stroke Patient Destination
- 606 - Documentation of Prehospital Care
- 834 - Patient Refusal of Treatment or Transport

RECEIVING FACILITIES

- Emergency Department Approved for Pediatrics (EDAP)
- Most Accessible Receiving (MAR)
- Pediatric Medical Center (PMC)
- Pediatric Trauma Center (PTC)
- Perinatal Center (N)
- Sexual Assault Center (SART)
- ST Elevation Myocardial Infarction Receiving Center (SRC)
- Primary Stroke Center (PSC)
- Comprehensive Stroke Center (CSC)
- Trauma Center (TC)

For a list of provider impressions for medical patients: See Los Angeles County EMS Agency Reference No 1200.3

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

MEDICATION ADMINISTRATION
ASPIRIN (ASA)

PERFORMANCE OBJECTIVES
Demonstrate proficiency in recognizing the indications, contraindications, and criteria for administration of aspirin to a patient having non-traumatic chest discomfort of suspected myocardial origin, who is over 30 years of age.

CONDITION
Establish that a simulated patient complaining of substernal chest discomfort meets the criteria for administration of aspirin and will assist the patient with administration of aspirin tablets(s). Necessary equipment will be adjacent to the simulated patient.

EQUIPMENT
Simulated patient, oxygen tank with a flow meter, oxygen mask, blood pressure cuff, stethoscope, Aspirin tablets (81mg), timing device, clipboard, PCR forms, pen, goggles, masks, gown, gloves.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Take body substance isolation precautions	• Mandatory personal protective equipment - gloves • Situational - long sleeves, goggles, masks, gown
♦ Complete a primary assessment • General impression • Life-threatening condition • Assess mental status/stimulus response (AVPU) • Assess/Manage airway • Assess/Manage breathing • Obtain an oxygen saturation (SpO_2) reading – if available ** ***Administer high flow oxygen – if indicated***	• A goal of oxygen administration is to deliver the minimum amount of oxygen to meet the needs of the patient and to maintain an oxygen saturation level at or above 94%. • When available, use pulse oximetry to guide the delivery of oxygen. The desired SpO_2 for most non-critical patients is 94-98%. • **SPECIAL CONSIDERATION:** For chronic obstructive pulmonary disease (COPD), the goal is to titrate oxygen to keep the SpO_2 at 88-92%. • Document the SpO_2 reading on the EMS Report or ePCR.
♦ Complete a secondary survey and obtain: • A complete set of vital signs • A pain scale	• Obtaining and documenting a baseline set of vital signs assists with determining if the patient is improving or deteriorating after medication delivery. • Have the patient rate their pain/discomfort on a scale from 0-10. Inform the patient that 0 indicates no pain/discomfort, and that 10 means excruciating pain.
♦ Verbalize the criteria for assisting patients with their own or "over the counter" OTC medications: • Medication is prescribed by a physician or is OTC • Meets indication for administration • No contraindications are present • An ALS unit has been requested	• An EMT may assist a patient in the prehospital setting with a patient's own prescribed medications. • In the event of a life-threatening situation, the EMT must evaluate the ETA to the most accessible receiving facility (MAR) versus the ETA of the responding ALS unit. If the ETA of the responding ALS unit exceeds the ETA to the MAR, it may be appropriate to provide immediate transport.

Skill Component	Key Concepts
♦ State when an EMT may carry, ASA on the ambulance and administer it to a patient with S/S of non-traumatic chest pain suspected to be of myocardial origin. • Must be on duty and working for a provider agency that has been approved by the EMS Agency Medical Director to carry Aspirin on the ambulance.	• If an EMT does not work for a provider agency that has been approved by the EMS Agency Medical Director to carry ASA, they may only assist the patient with their own prescribed or "over the counter" (OTC) ASA.
♦ State the mechanism of actions for Aspirin (ASA): • Antithrombotic • Analgesic • Antipyretic • Anti-inflammatory	• While ASA has many more uses, it is only used for its antithrombotic properties in the prehospital setting. • Cardiovascular disease (CVD) is a health problem throughout the world. Cardiovascular disease may also be referred to as "Acute Coronary Syndrome (ACS)." Study data overwhelmingly supports the use of ASA in the treatment of ACS. • Two (2) major manifestations of CVD are heart disease and cerebral vascular accident (CVA). • American Heart Association/American College of Cardiology (AHA/ACC) recommends treating patients initially with 162-325mg followed by a maintenance dose of 81-162mg daily. • Chewing 162mg of ASA allows the ASA to faster absorption into the system, thereby raising the therapeutic blood levels rapidly. • Millions of patients take low-dose ASA for both treatment and prevention of CVD. • The benefits of taking ASA have been recognized in the 20th century. • ASA's mechanism of action involves both the inhibition of platelet activation and aggregation. ***Hindawi Publishing Corporation, Thrombosis "Clinical Use of Aspirin in Treatment and Prevention of Cardiovascular Disease, Volume 2012, article ID 245037, 7.*** • Pathophysiology: ✓ Atherosclerotic plaques within the coronary arteries develop. When plaque occurs, chemicals are released that cause platelets to aggregate within a coronary artery and form a blood clot. When a blood clot becomes large enough, it will block the flow of blood through the coronary artery. The heart muscle is deprived of oxygen rich blood and subsequently will die unless blood flow resumes.
♦ Verbalize the adverse (side) effects associated with administration of ASA: • Gastrointestinal: ✓ Ulcers ✓ GI bleeding • Respiratory: ✓ Bronchospasm/wheezing • Otic: ✓ Tinnitus • Hematological ✓ Bleeding • Other: ✓ Reye's Syndrome	• While ASA has the potential to cause significant side effects, it is considered a first-line medication when its indications for use are met.

Skill Component	Key Concepts
♦ Verbalize the <u>indications</u> for assisting or administering ASA to a patient: • The patient must be alert • Non-traumatic chest discomfort of suspected myocardial origin • Over 30 years of age.	• Chest pain may be described as: ✓ Sharp ✓ Dull ✓ Stabbing ✓ Crushing ✓ Burning • Women are known to have atypical presentations of chest pain or have no chest discomfort at all. While men may and women may both experience similar signs and symptoms, women may be more likely to experience shortness of breath, abdominal pain, nausea/vomiting, weakness/dizziness, back, or jaw pain. • Regardless of how a patient rates their pain, any level of chest pain on the 0-10 scale should be treated with Aspirin in the absence of contraindications. • EMT's may still administer ASA to a patient taking other anticoagulants because their mechanisms of actions differ. • Signs and symptoms of **cardiac related chest pain** include: ✓ Sub-sternal chest pain/discomfort ✓ May radiate to: ▪ Jaw ▪ Neck ▪ Left or right arm ▪ Abdomen ✓ Nausea/Vomiting ✓ Diaphoresis ✓ Shortness of breath ✓ Palpitations
♦ Verbalize the contraindications for the use of ASA: • Patient does not meet the indications • Patient has a history of a GI bleed or peptic ulcer disease • Allergic to Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) e.g. Motrin.	• **<u>WARNING: Patients with a history of asthma and nasal polyps have a higher risk for having an allergy to ASA. Administer the ASA and closely monitor the patient for signs of respiratory distress and hives after administration in these cases.</u>** • There is a correlation between asthma and hypersensitivity to ASA. This is associated with chronic nasosinositis and polyps. • Since patients having chest pain must be transported by Advanced Life Support (ALS) personnel, it is better to defer the administration of ASA until ALS arrives on scene.
♦ Verbalize the proper adult dosage of ASA: • Adults – 162-324mg chewable (Based upon local protocols)	• Medication strengths (Tablets): ✓ 81mg/chewable tablets ✓ 325mg tablets • Currently, 81mg ASA tablets are the only strength carried on an ALS unit • The actual dose administered is based upon local protocols that have been established by the EMS Agency Medical Director.
♦ Check medication for: • Drug name • Integrity of container/medication • Concentration/Dose • Clarity • Expiration date	• <u>Drug name</u> - Trade Names: Aggrenox®, Bayer®, Ascriptin®, Empirin®, Aspergum®. • <u>Integrity of container/medication</u> - Make sure container is NOT damaged or broken. • <u>Concentration/Dose</u> – the concentration only refers to liquid forms of any medication. The dose is the amount of the medication that was prescribed by the physician. • <u>Clarity</u> - if container is transparent, the liquid should be clear. • <u>Expiration date</u> – The ASA must not be administered after the expiration date.

PROCEDURE	
Skill Component	**Key Concepts**
♦ Remove the proper number of tablets from the container and determine if the tablet is intact.	• Do not administer ASA tablets that show signs of crumbling or discoloration. There is no way to ensure that the patient is getting the recommended dose, or if the tablets have lost their potency. Discard if needed and await for ALS to respond
♦ Remove the oxygen source from the patient – if applicable	
♦ Asks the patient to open their mouth	
♦ Place the proper amount of ASA tablets into the patient's mouth and instructs them to chew the tablets	• Chewing 162mg of ASA allows for faster absorption into the system. • While the recommended dosage of ASA is 162-325mg, the actual dosage administered is dependent upon how the ASA was prescribed for the patient by their physician and/or local protocols. • If the patient daily home dosage is 81mg and they are experiencing chest pain suspected to be of myocardial origin, the EMT must administer additional tablets to achieve the approved dosage range of 162-324mg.
♦ Replace the oxygen source – if indicated	• A goal of oxygen administration is to deliver the minimum amount of oxygen to meet the needs of the patient and to maintain an oxygen saturation level at or above 94%. • When available, use pulse oximetry to guide oxygen delivery. The desired SpO_2 for most non-critical patients is 94-98%.

REASSESSMENT (Ongoing Assessment)	
Skill Component	**Key Concepts**
§ Repeat an ongoing assessment at least every **5 minutes**: • Primary assessment • Relevant portion of the secondary assessment • Vital signs • Pain Scale ***Manage patient's condition as indicated.**	• Patients with chest pain suspected to be of myocardial origin are priority patients. • A patient is considered a priority patient if the assessment reveals an immediate threat to life i.e. vital signs that are grossly abnormal and S/S of shock. • The purpose of the ongoing assessment is to recognize signs and symptoms of improvement or deterioration of the patient's condition. • Evaluating and comparing results from a prior assessment assists in trending the patient's condition. This helps to facilitate rapid interventions - if required.

PATIENT REPORT AND DOCUMENTATION	
Skill Component	**Key Concepts**
§ Verbalize/Document • Assessment findings before and after administration • Drug - name - dose - route - site - time - who administered medication • Patient's response to medication • Respiratory/Cardiovascular status • Mental status • Vital signs	• Documentation must be on either the Los Angeles County EMS Report, departmental Patient Care Record form, or ePCR. • Document administration only in the comment section on the Los Angeles County EMS Report, • Documenting reassessment information provides a comprehensive picture of patient's response to treatment. • Last reassessment information (before patient care is transferred) should be documented in the appropriate section of the EMS form.

Developed: 9/2017

MEDICATION ADMINISTRATION
ASPIRIN (ASA)
Supplemental Information

DEFINITION:

Cardiovascular Disease: Conditions that involve disease of the blood vessels (BV), which leads to narrowing or blockage of BVs.This disease of the BVs can lead to angina, a heart attack, or cerebral vascular accident (stroke).

Angina: Non-traumatic chest pain that is suspected to be myocardial in origin that is caused by an inadequate amount of blood perfusing the myocardium (heart muscle). If the blood flow is not restored, it will lead to death of the heart muscle.

Acute Myocardial Infarction: Death of heart muscle**.** The extent of the damage is determined by the area of muscle that is supplied blood from the occluded artery.

Cerebral Vascular Accident (CVA): Death of brain cells (tissue) due to the lack of oxygen being delivered to the portion of the brain supplied by the occluded vessel. It can also be caused by the rupture of blood vessels inside the brain.

ASSESSMENT: CHEST PAIN - SUSPECTED CARDIAC:

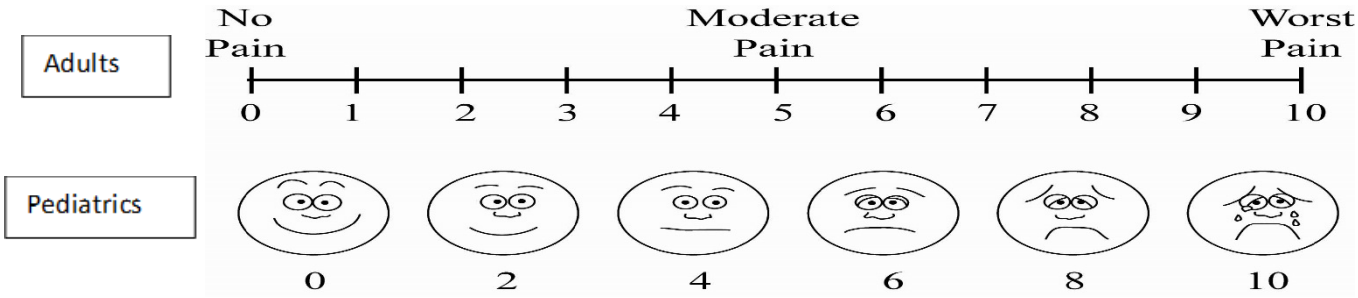
- Medical and trauma conditions can be evaluated by using the mnemonic OPQRST:
  Onset – activity at time the problem/pain started
  Provokes – what makes it worse, **P**alliative – what makes it better, **P**osition – what position is patient found
  Quality – type of discomfort (burning stabbing crushing) and constant or intermittent
  Region – area involved, **R**adiation – does the pain/discomfort spread from origin, **R**ecurrence – has this occurred before
  Severity – pain scale 0-10
  Time – when did the problem/pain begin and what is the duration of time

NOTES:

- Prior to the administration ASA, an attempt should be made to determine if the patient has a history of asthma and nasal polyps. If ASA is administered to a patient with Chronic Rhinosinusitis the patient is at a higher risk for anaphylaxis.
- EMTs are accountable for knowing the indications, contraindications, mechanism of action, and criteria for administration of ASA.
- The indications for administration of ASA include: non-traumatic chest discomfort that is suspected to be myocardial in origin, and are over 30 years of age. In patients whom are less than 30 years of age are rarely experiencing events that are caused by clots within a coronary artery.
- If an EMT does not work for a provider agency that has been approved by the EMS Agency Medical Director to carry ASA, they may only assist the patient with their own prescribed or “over the counter” (OTC) ASA.
- In life-threatening situations, an ALS Unit must be enroute or BLS should consider transport if ALS arrival is longer than transport time.
- Women are known to have atypical presentations of chest pain or have no chest discomfort at all. While men may and women may both experience similar signs and symptoms, women may be more likely to experience shortness of breath, abdominal pain, nausea/vomiting, weakness/dizziness, back, or jaw pain.
- If the patient daily home dosage is 81mg and they are experiencing chest pain suspected to be of myocardial origin, the EMT must administer additional tablets to achieve the approved dosage range of 162-324mg.

PAIN / DISCOMFORT

- When did the pain/discomfort first began (minutes - weeks) and if acute or chronic
- Causative event and what makes it better or worse
- Type of pain, i.e. sharp, ache, squeezing, burning, etc.
- Area effected and if focal or diffuse
- Pain moves to another area away from its origin
- Constant or intermittent
- 0 - 10 pain scale (initial event and ongoing assessment)
- Duration



ASPIRIN (acetylsalicylic acid [ASA])

Classification:
- Anticoagulant, Platelet Inhibitor

Actions:
- Inhibits the aggregation (clumping) of platelets
- Prolongs bleeding time

Indications:
- Chest pain of myocardial origin
- Prevent blood clot formation in arteries

Contraindications:
- Allergy to aspirin or non-steroidal ant inflammatory drugs NSAIDs
- Bleeding disorder
- GI bleed
- History of ulcer disease

Adverse Effects:
- *Neurological*
  tinnitus
- *Respiratory*
  may exacerbate asthma
- *Gastrointestinal*
  GI bleeding
  nausea
  abdominal pain

Administration: 4 (81mg tablets) Total 324mg PO chewed then swallowed

Pediatric: Not recommended for pediatrics

Onset: Within 5-10 minutes (Absorbed in the stomach and small intestines and metabolized in the liver)

Duration: 24 hours

Prehospital Consideration:
- Administer regardless if patient is on anticoagulants or has taken aspirin prior to EMS arrival
- The 81mg tablets are more palatable to chew and swallow, especially for nauseated cardiac patients
- May exacerbate asthma

Precautions:

Aspirin is for EMERGENCY SUPPORTIVE THERAPY ONLY and not a substitute for immediate medical care. The patient must be transported immediately to the nearest emergency department if ALS response is not available or delayed.

Notes:
- Aspirin is safe and effective treatment for heart attacks, ischemic strokes, certain vascular conditions and rheumatologic diseases.
- Long- term, low dose aspirin - used to reduce the risk of recurrent heart attacks, sudden death, ischemic strokes, and poor circulation to the legs.
- Short-term - used for immediate anti-clotting effect to limit the extent of damage to the myocardium or brain.
- Anticoagulants and ETOH abuse potentiate the risk of bleeding.

Developed 1/15

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

MEDICATION ADMINISTRATION
BRONCHODILATOR METERED DOSE INHALER (MDI)

PERFORMANCE OBJECTIVES
Demonstrate proficiency in recognizing the indications, contraindications, criteria for administration of a bronchodilator. Also demonstrate proficiency in assisting a patient with the administration of a bronchodilator inhaler, a physician prescribed emergency medication.

CONDITION
Establish that a simulated patient complaining of difficulty breathing meets the criteria for administration of a bronchodilator inhaler and assist the patient with administering the medication with or without using a spacer device. Necessary equipment will be adjacent to the patient.

EQUIPMENT
Simulated patient, oxygen tank with a flow meter, oxygen mask, blood pressure cuff, stethoscope, placebo bronchodilator inhaler cartridge with a plastic mouthpiece, spacer device, timing device, clipboard, pen, eye protection, masks, gown, gloves.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish appropriate body substance isolation precautions	• Mandatory personal protective equipment - gloves • Situational - goggles, masks, gown
♦ Perform a primary assessment: • General impression • Life-threatening condition • Assess mental status/stimulus response (AVPU) • Assess/Manage airway • Assess/Manage breathing • Rapid chest auscultation • Assess/Manage circulation ** ***Administer oxygen per Los Angeles County EMS Agency Reference No. 1304***	• Any patient complaining of moderate to severe respiratory distress should be placed on oxygen if a pulse oximeter is not available. • For patients with a history of chronic obstructive pulmonary disease (COPD), the goal is to titrate oxygen to keep the SpO_2 at 88-92%. • Use the most effective oxygen delivery system that can be tolerated by the patient. • Assess breathing for rate, rhythm, quality of respirations and perform a rapid chest auscultation to assess initial breath sounds.
♦ Complete an appropriate secondary assessment ***Performs a focused assessment of the chest***	• An appropriate secondary assessment includes a focused assessment of the chest along with chest auscultation.
♦ Verbalize the criteria for assisting patients with medications: • Medication prescribed by a physician • Medication prescribed for patient • Meets indication for administration • No contraindications are present for administration	• EMTs may *only* assist with administration of a bronchodilator inhaler as per Reference 802 - Emergency Medical Technician Scope of Practice. • EMTs may NOT carry bronchodilator inhalers, but may assist with the patient's *own* prescribed medication. • In life-threatening situations, an ALS Unit must be enroute or BLS should consider transport if ALS arrival is longer than transport time.

Skill Component	Key Concepts

♦ Verbalize the indications for assisting the patient with a bronchodilator inhaler:
• Symptoms of respiratory distress
  • shortness of breath
  • wheezing
  • coughing
  • difficulty speaking.
	• Symptoms include shortness of breath, wheezing, coughing (usually dry and irritated), distressed breathing, and difficulty speaking.

♦ Verbalize the contraindications for administration of a bronchodilator inhaler: • Patient has taken maximum prescribed dose before EMS arrival • Patient is unable to follow directions or use the inhaler	• One dose is defined as the number of puffs (sprays) that is prescribed by the physician. This information is obtained from the physician's order which is found on the box or inhaler cartridge. • Do not administer if the patient does not meet indication or criteria for administration

PROCEDURE

Skill Component	Key Concepts
♦ Check medication for: • **D**rug name • **I**ntegrity of container/medication • **C**oncentration/Dose • **C**larity • **E**xpiration date	• Drug name - Trade and generic names include: albuterol, Proventil, Ventolin, Alupent, AccuNeb, Metaproterenol, Metaprel, Brethaire, Brochometer, etc **NOT ALL INHALERS** are bronchodilators; EMTs are only allowed to assist with bronchodilators prescribed as rescue inhalers. • Integrity of container/medication - Make sure container is NOT broken • Concentration/Dose - dose of a bronchodilator is the number metered sprays administered. (Concentration refers only to the liquid form of medications.) • Clarity -if container is transparent, the liquid should be clear • Expiration date - not to be administered after this date
♦ Prepare Medication: • Remove the mouthpiece cover Shake inhaler vigorously 5-6 times ** ***Insert cartridge into plastic mouthpiece case - if not done previously*** ** ***Attach spacer device- if needed***	• Always check the mouthpiece to ensure it is clear of foreign objects in the mouthpiece. • If the inhaler has not been used for several days test spray it into the air (away from individuals).
♦ Remove the oxygen source – *if indicated*	
♦ Instruct the patient to breath out normally (not forcefully)	
♦ Position the inhaler: ***Place the inhaler inside of the patient's mouth, past the teeth, above the tongue*** ***OR*** ***Attach a spacer to the mouth piece and close the lips of the patient around spacer***	• Ensure that spray opening is pointed toward patient • The cartridge should be on top and the mouthpiece on the bottom. • Everyone cannot use an inhaler effectively. Spacers may be used by children and patients who are older, have arthritis, or just cannot coordinate inhalation and medication administration activity.

Skill Component	Key Concepts
♦ Instruct the patient to inhale slowly and deeply and depress inhaler **Without Spacer** • Have the patient inhale for 5-7 seconds and press the inhaler one (1) time (1 spray or puff) **With Spacer** • Press the inhaler one (1) time and have patient breathe in and out normally 3-4 breaths ** **May repeat sprays as prescribed - *if needed***	• Ensure that the patient has started inhalation prior to depressing the inhaler. • Patient should not stop inhaling once the spray is delivered, but continue to inhale as long as possible (usually 5-7 seconds). • This time frame mixes the medication with the incoming air and pulls it into the lungs slowly. • If using a spacer, there may be a whistling sound if the patient inhales too rapidly. • Avoid spraying into patient's eyes or vision will be temporarily blurred. • Dose of a bronchodilator is the numbered metered sprays that were administered.
♦ Remove the inhaler	
♦ Instruct the patient to hold his/her breath for as long as comfortable or up to 10 seconds before breathing out slowly through pursed lips	
♦ Replace the oxygen source – *if indicated*	• Administer supplemental O_2 titrated to a SpO_2 94-98%.
♦ Reassess respiratory function, breath sounds and patient's response after 3 minutes	• Medication will take effect in within five (5) minutes and last 4-6 hours depending on medication administered. Evaluate breath sounds in all fields, and assess rate, rhythm, and quality of respirations.

RE-ASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
§ Repeat an ongoing assessment at least- every five (**5) minutes**: • Primary assessment • Focused secondary assessment • Adequacy of lung Sounds a • Relevant portion of the secondary assessment • Vital signs: BP, Pulse, and Respirations	• Patients must be re-evaluated at least every five (5) minutes or sooner if any treatment was initiated, medication administered or a change in the patient's condition occurs or is anticipated • An unstable patient is one who have abnormal vital signs, S/S of poor perfusion, or if there is a suspicion that the patient's condition may deteriorate.
♦ Evaluate results of reassessment and note any changes from patient's previous condition and vital signs ***Manage the patient's condition as indicated.***	• Evaluating and comparing the results to treatment during a re-assessment assists with recognizing if the patient is improving, responding to treatment or condition is deteriorating.
♦ Continue O2 therapy until the transfer of patient care has occurred.	• Once oxygen therapy has been initiated, it should be continued until the transfer of patient care has occurred.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Verbalize/Document • Assessment findings before and after administration • Drug - name - dose - route/site - time - who administered medication • Repeat dose - *if indicated* • Patient's response to medication • Respiratory status • Cardiovascular status • Mental status • Vital signs	• Documentation must be on either the Los Angeles County EMS Report or departmental Patient Care Record form. • Document administration only in the comment section on the Los Angeles County EMS Report form. • Documenting reassessment information provides a comprehensive picture of patient's response to treatment. • Last reassessment information (before patient care is transferred) should be documented in the section of the EMS form that is called "Reassessment after Therapies and/or Condition on Transfer."

Developed: 1/02 Revised 10/2/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

MEDICATION ADMINISTRATION
BRONCHODILATOR METERED DOSE INHALER (MDI)

Supplemental Information

ASSESSMENT: RESPIRATORY DISTRESS:

Onset	Gradual vs. sudden (when it began)
Provoking	Causative event, (allergy, exertion, drugs, etc.)
Quality	Effective ventilations, tidal volume, difficulty getting air in or air out
Rate	Fast, slow, normal, respiratory pattern
Recurrence	Initial vs. repeated episodes (time of last episode)
Relief	Constant vs. intermittent (what makes it better or worse)
Severity	Mild, moderate, severe - used to rate initial event or compare to previous episode or ongoing assessment, accessory muscle use, stridor, position, etc.
Time	Duration
Distress level considerations for chief complaint of shortness of breath (SOB)	
Mild	Tachypnea, normal position, answers in full sentences
Moderate	Tachypnea, upright position, answers in partial sentences
Severe	Tachypnea, tripod position, answers in 2-3 words only

DEFINITIONS:

- Hypoxemia - decreased oxygen level in arterial blood
- Pursed lips - lips made smaller by puckering. This decreases resistance to air flow by dilating small bronchi.

NOTES:

- Symptoms of asthma include shortness of breath, wheezing, coughing (usually dry and irritated), distressed breathing, and difficulty speaking.
- In a cold environment, warm the canister by rolling it between your hands before use. This results in smaller particles of medication being inhaled and better distribution and absorption by the lungs.
- The patient should not stop inhaling once the dose is delivered, but continue to inhale as long as possible (usually 5-7 seconds). This time frame mixes the medication with the incoming air and pulls it into the lungs slowly.
- If using a spacer, there may be a whistling sound if the patient inhales too rapidly.
- Avoid spraying into patient's eyes or vision will be temporarily blurred
- Patients may use the following breathing devices:
  - Inhaler
  - Inhaler with spacer
  - Hand held nebulizer
  - Pulmonaid device
- The patient or caretaker must set up the devices that an EMT is unfamiliar with such as the hand held nebulizer and the Pulmonaid device

REFERENCE:

- Reference 802, 802.1 – Los Angeles County Emergency Medical Technician Scope of Practice

BRONCHODILATOR INHALERS

ALBUTEROL SULFATE

Alupent[7], AccuNeb[7], Atrovent[7], Brethine[7], Bricanyl[7], Brethaire[7], Brochometer[7], Bronkosol[7], Metaproterenol[7], Metaprel[7], Proventil[7], Singulair[7], Terbutaline[7], Ventolin[7], Volmax[7], Xopenex[7], etc.

Classification: ∝ Bronchodilator

Actions:
- ∝ Dilates bronchioles
- ∝ Reduces airway resistance

Indications:
- ∝ Bronchospasm caused by:
  - $ Acute asthma
  - $ COPD
  - $ Bronchitis
  - $ Toxic gas inhalation
  - $ Near drowning
  - $ Drug overdose
  - $ Pulmonary edema
- ∝ Crush syndrome
  - $ Suspected hyperkalemia
  - $ Crush force > 4 hours

Contraindications:
- ∝ Maximum prescribed inhalation dose taken by patient
- ∝ Inhaler not prescribed for patient

Adverse Effects:

Cardiovascular
- tachycardia
- hypertension

Respiratory
- cough
- wheezing

Neurological
- tremors
- nervousness
- headache
- dizziness

Gastrointestinal
- nausea

Administration: **EMT-Basic providers are not authorized to carry bronchodilators, but may assist patient with their <u>own</u> physician prescribed bronchodilator inhaler.**

1 spray inhaled by using either the metered dose inhaler with or without a spacer device. May repeat 1 spray in 3-5 minutes one time.

Pediatric:

< 12 years	Not recommended for prehospital use
> 12 years	Same as adult

Onset: Within 5 minutes

Duration: 4-6 hours

Precautions:

The albuterol inhaler is for <u>EMERGENCY SUPPORTIVE THERAPY ONLY</u> and not a substitute for immediate medical care. The patient must be transported immediately to the nearest emergency department if ALS response is not available or delayed.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

MEDICATION ADMINISTRATION
EPINEPHRINE AUTO-INJECTOR

PERFORMANCE OBJECTIVES
Demonstrate proficiency in recognizing the indications, contraindications, and criteria for administration of epinephrine to a patient with anaphylaxis or severe asthma.

CONDITION
Establish that a simulated patient complaining of a severe allergic reaction with respiratory distress or severe asthma meets the criteria and will assist the patient with the administration of epinephrine using an auto-injector device. Necessary equipment will be adjacent to the simulated patient.

EQUIPMENT
Simulated patient, oxygen tank with a flow meter, oxygen mask, blood pressure cuff, stethoscope, auto-injector trainer, biohazard container, alcohol wipes, adhesive bandage, timing device, clipboard, PCR forms, pen, goggles, masks, gown, gloves.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions	• Mandatory personal protective equipment - gloves • Situational - goggles, masks, gown
♦ Complete a primary assessment • General impression • Life-threatening condition • Assess mental status/stimulus response (AVPU) • Assess/Manage airway • Assess/Manage breathing ** ***If the patient has a prescribed inhaler, encourage the patient to use it - if the patient is able to follow directions***	• **Do not delay the use of a physician prescribed multi-dose inhaler. EMT may assist with the use of the inhaler prior to administration of epinephrine**
♦ Complete a secondary assessment • SAMPLE history • OPQRST for shortness of breath • Vital Signs • Obtain an oxygen saturation (SpO_2) reading – if available ** ***Administer high flow oxygen – if indicated***	• Patients in a moderate or severe level of distress should be placed on high flow oxygen. • Obtaining and documenting a baseline set of vital signs assists with determining if the patient is improving or deteriorating after medication delivery • Document the SpO_2 reading on the provider report or ePCR. • A goal of oxygen administration is to deliver the minimum amount of oxygen to meet the needs of the patient and to maintain an oxygen saturation level of 94-98%. • **SPECIAL CONSIDERATION:** For chronic obstructive pulmonary disease (COPD), the goal is to titrate oxygen to keep the SpO_2 at 88-92%. • A pertinent piece of information that must be determined for patients with asthma and allergic reaction is to ask “have you ever been intubated for your asthma/allergic reaction?” This provides you with information that may indicate the potential rapid deterioration.

Skill Component	Key Concepts
♦ State the criteria for assisting patients with their own medications: • Medication is prescribed by a physician • Meets indication for administration • No contraindications are present • An ALS unit must have been requested	• An EMT may assist a patient in the prehospital setting with a patient's own prescribed medications. An adult patient **MAY NOT** use their child's medication for themselves and vice versa. • EMTs may *only* assist with administration of epinephrine using an auto-injector device as per Reference 802 - Emergency Medical Technician Scope of Practice.
♦ State when an EMT may carry an EpiPen on the ambulance and administer it to a patient with S/S of anaphylaxis or severe asthma • Must be on duty and working for a provider agency that has been approved by the EMS Agency Medical Director to carry Epinephrine on the ambulance.	• EMTs may carry an EpiPen on the ambulance ONLY if they are on duty and working for a provider agency that has been approved by the Local EMS Agency (LEMSA) Medical Director. • If an EMT does not work for a provider agency that has been approved by the EMS Agency Medical Director to carry Epinephrine, they may only assist the patient with their own prescribed EpiPen.
♦ State the mechanism of actions for epinephrine: • Bronchial dilation • Blood vessel constriction • Increases blood pressure • Increases the pulse rate	• Epinephrine is a naturally occurring hormone in the body that controls the body's fight or flight reactions. It is secreted by the Adrenal glands. • Epinephrine is classified as a sympathomimetic, which increases the blood pressure and heart rate, and causes bronchial dilation to bring in more oxygen to the tissues. (Fight response)
♦ Verbalize the adverse (side) effects associated with administration of epinephrine: • Cardiovascular: o Tachycardia o Hypertension o Chest pain o Arrhythmias o Increased oxygen demand • Neurological: o Seizures o Cerebral hemorrhage o Tremors o Dizziness o Anxiety • Gastrointestinal: o Nausea/vomiting • Respiratory: o Difficulty breathing	• While epinephrine has significant side effects associated with its use, it is considered a life-saving medication when indications for use are met. • If anaphylaxis and severe asthma are not treated, the patient is likely to deteriorate and ultimately go into cardiac arrest. When this occurs, epinephrine is the first-line medication administered by Advanced Life Support (ALS) personnel to patients in cardiac arrest.
♦ Verbalize the indications for assisting or administering epinephrine (EpiPen) auto-injector to a patient • Suspected anaphylaxis and/or severe asthma • Signs and Symptoms of **ANAPHYLAXIS** include: o Airway/facial swelling o Stridor o Hives o Hypotension o Itching o Hypotension o Accessory muscle use o Wheezing • Signs and symptoms of **SEVERE ASTHMA** include: o Tripod positioning o Wheezing/Absent "breath" sounds	• If a patient has his/her own EpiPen, he/she may administer his or her own medication with lesser signs/symptoms. EMTs may assist the patient with a patient's physician prescribed Epinephrine. • EMTs may administer epinephrine to a patient ***ONLY*** if there are signs/symptoms of anaphylaxis or severe asthma, which includes signs and symptoms of shock and/or airway compromise. • A pertinent piece of information that must be determined for patients with asthma and allergic reaction is to ask "have you ever been intubated for your asthma/allergic reaction?" • This provides you with information that may indicate the potential rapid deterioration. • Patients with anaphylaxis may deteriorate rapidly. Therefore, be prepared to administer positive pressure ventilation using a bag-mask device.

Condition… ○ Diaphoresis ○ Cyanosis ○ Using all accessory muscles to breathe ○ Decreased oxygen saturation levels < 94% in a patient without COPD ○ Decreased oxygen saturation levels < 88 to 92% in a patient with COPD	Condition… • The **onset of action** of epinephrine for anaphylaxis and severe asthma is 5 -10 minutes with peak effects occurring within 20 minutes. • The **duration** of action is 4 - 6 hours. • In severe asthma and anaphylaxis, bronchial constriction may be so severe that it is difficult to auscultate wheezing. • Administration of epinephrine causes the bronchial dilation, so wheezing may become more pronounced. ***<u>This means the patient is improving instead of deteriorating.</u>*** • After administration of epinephrine, the signs and symptoms of anaphylaxis are reversed.
Skill Component	**Key Concepts**
♦ Contraindications: • There are no absolute contraindications to the use of epinephrine if the patient is experiencing life threatening anaphylaxis or asthma.	• There are no absolute contraindications for the use of epinephrine in a life-threatening situation. • Epinephrine is **NOT** indicated for patients without signs and symptoms of respiratory distress
♦ Check medication for (DICCE): • Drug name • Integrity of container/medication • Concentration/Dose • Clarity • Expiration date	• <u>Drug name</u> - Trade names include: Adrenalin EpiPen, EpiPen Jr., AnaPen, Ana-Guard, Sus-Phrine Injection, Twinject, Ana-Kit, etc. • <u>Integrity of container/medication</u> - Make sure container is **NOT** broken • <u>Concentration/Dose</u> – the concentration only refers to liquid form of any medication. The dose is the amount of medication prescribed by the physician. • <u>Clarity</u> - if container is transparent, the liquid should be clear • <u>Expiration date</u> - not to be administered after this date
♦ States the proper adult and pediatric dosage of Epinephrine: • Adults - 0.3mg IM auto-injector/EpiPen • Pediatrics < 3 years of age or weighs < 15kg – 0.15mg IM auto-injector	• When a pediatric patient requires the administration of medication in the field, the Pediatric Resuscitation Tape must be used to determine the proper dose of medications.
PROCEDURE	
Skill Component	**Key Concepts**
♦ Call for an Advanced Life Support (ALS) unit	• If the administration of epinephrine is required, an ALS unit <u>must</u> be contacted and be enroute. However, if the estimated time of arrival (ETA) for the responding ALS unit exceeds the ETA to the most appropriate Emergency Department (ED), the EMT should consider transporting the patient.
Identify location of injection site: • Remove clothing from thigh area • Locate site - upper-outer thigh	• Patients may have been instructed that they can use EpiPen through clothing. **<u>This is not recommended for healthcare providers.</u>** • The-upper-outer thigh is best explained as midway between the groin and the knee. Injection in the deltoid muscle is NOT recommended in Los Angeles County.  • **<u>DO NOT</u>** <u>inject into buttocks, hands, feet, or intravenously (IV).</u> Injection into the buttocks, hands, or feet may result in loss of blood flow to these areas and result in delayed absorption and tissue necrosis. IV injection may cause an acute myocardial infarction or cerebral hemorrhage.

Skill Component	Key Concepts
♦ Cleanse injection site with alcohol wipe § ***Allow the area to air dry if time permits***	• Cleanse the injection site with an alcohol wipe, in a circular motion, from inner to outer.
♦ Remove the safety cap from auto-injector	• **DO NOT** cover this end of the safety cap with fingers since the pressure may activate the injector device and inadvertently inject self.
♦ Place the tip of the auto-injector at a 90° angle to the lateral thigh	• The auto-injector must be placed at a right-angle to the thigh for IM injection.
♦ Push tip of auto-injector forcefully against injection site	• Pressure on the tip of the injector is required to activate the spring-loaded needle.
♦ Continue to hold the injector in place for three (3) seconds until the medication is injected	• It may take up to three (3) seconds for the medication to be injected.
♦ Remove the injector and place in biohazard sharps container	• Caution must be taken with auto-injectors, the needle does not retract.
♦ Massages the injection site for three (3) seconds	• Massaging the site assists with absorption of the medication.
♦ Apply adhesive bandage - <u>if bleeding</u>	
♦ Evaluate response to epinephrine administration: • <u>Respiratory status</u> - rate, tidal volume, lung sounds • <u>Cardiovascular status</u> - pulse, blood pressure, skin vitals • <u>Mental status</u> ** ***Treat for shock - <u>if indicated</u>*** ** ***Initiate BLS Procedures (CPR, AED) - <u>if indicated</u>***	• The use of epinephrine is the definitive treatment for shock in anaphylaxis. • Shock position is no longer utilized. Patients in shock should be placed in a supine position – *if tolerated.* • The **duration** of action is 4 - 6 hours.

RE-ASSESSMENT/PATIENT REPORT/DOCUMENTATION
(Ongoing Assessment)

Skill Component	Key Concepts
§ Re-assess the patient at least every five (**5) minutes**: • Primary assessment • Relevant portion of the secondary assessment • Vital signs ***Manage patient's condition as indicated.*** ***Administer a repeat dose of epinephrine in 10 minutes if:*** • ***If the ETA for an ALS unit is greater than 10 minutes*** ***OR*** • ***If the ETA to the closest ED is > 10 minutes***	• Patients with severe asthma and/or anaphylaxis are unstable. A patient is considered unstable if the assessment reveals an immediate threat to life i.e. vital signs that are grossly abnormal and S/S of shock. • Evaluating and comparing the results from a prior assessment assists in recognizing that the patient is improving, responding to treatment or condition is deteriorating.

Skill Component	Key Concepts
§ Verbalize/Document • Assessment findings before and after administration • Drug - name - dose - route - site - time - who administered medication • Patient's response to medication • Respiratory/Cardiovascular status • Mental status • Vital signs	• Documentation of medication administration must be on either the Los Angeles County EMS Report Form, Provider's form, or an ePCR. • Documenting re-assessment information provides a comprehensive picture of patient's response to treatment.

Developed: 1/02 Revised 11/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

MEDICATION ADMINISTRATION
EPINEPHRINE AUTO-INJECTOR
Supplemental Information

DEFINITION:

- Anaphylaxis – A severe allergic reaction that comes on suddenly and rapidly progress to an exaggerated, life threatening reaction that may lead to cardiovascular collapse and respiratory arrest.

ASSESSMENT: ALLERGIC REACTION / ANAPHYLAXIS / ENVIRONMENTAL EMERGENCY:

- *Onset* - history of allergy
- *Substance* - type of substance
- *Exposure* - ingestion, inhalation, absorption, envenomation
- *Time* - duration
- *Effect* - respiratory problems, general vs. local rash, hives, nausea, vomiting, itching etc.
- *Progression* - initial symptom to current condition
- *Relief* – decrease of symptoms with treatment rendered prior to EMS

ASSESSMENT: RESPIRATORY DISTRESS FROM ACUTE ASTHMA:

- ***O**nset* - gradual vs. sudden and when it began
- ***P**rovokes* - causative event (e.g. allergy, exertion, drugs, etc.)
- ***Q**uality* - effective ventilations, tidal volume, and difficulty getting air in or out
- ***R**ate* - fast, slow, normal, and respiratory pattern
- ***R**ecurrence* - initial vs. repeated episodes and time of last episode
- ***R**elief* - constant vs. intermittent and what makes it better or worse
- ***S**everity* - mild, moderate, severe (used to rate initial event or compare to previous episode or ongoing assessment) accessory muscle use, stridor, position, etc.
- ***T**ime* – duration of current episode

Level of distress for chief complaint of shortness of breath (SOB)

SHORTNESS OF BREATH SEVERITY SCALE			
S/S	**Mild**	**Moderate**	**Severe**
Dyspnea	When walking	When talking	At rest,
Ability to speak	Full sentences	Phrases or partial sentences	Single words
Heart Rate	Borderline Tachycardia	100-120bpm	>120bpm
Respiratory Rate	Tachypnea	Tachypnea	>30/min
Breath Sounds	Mild wheezes at the end expiration	Throughout expiration	Inspiration and expiration
Accessory Muscle use	None	Common	All
Mental Status	Anxious	Agitation	Drowsy to agitated
Body Position	Normal posture	Sits upright	Tripod position
Skin Signs	Normal – warm, normal color, dry	Cool, pale,dry,	Cool, pale, moist (diaphoretic)

NOTES:

- Anaphylaxis may be caused by insect stings or bites, foods, drugs, other allergens, exercise, or may be spontaneous.

EPINEPHRINE HYDROCHLORIDE

EPINEPHRINE AUTO-INJECTOR

Adrenalin®, EpiPen, EpiPen Jr®, AnaPen®, Ana-Guard®, Ana-Kit,Sus-Phrine Injection®,Twinject®

Classification: Sympathomimetic agent (catecholamine)

Actions: Dilates bronchioles

Constricts blood vessels

Indications: Anaphylaxis and severe asthma

Contraindications: Not significant in above indication

Adverse effects:

Cardiovascular
- **tachycardia**
- **hypertension**
- chest pain
- **ventricular fibrillation**

Respiratory
- **difficulty breathing**

Gastrointestinal
- nausea/vomiting

Neurological
- **seizures**
- **cerebral hemorrhage**
- headache
- tremors
- dizziness
- anxiety

Administration: **Basic providers are not authorized to carry an Epinephrine Auto-Injector, but may assist patients with their own physician prescribed device.**

Epinephrine Auto-Injector (0.3mg) IM in the upper-outer thigh. No repeat.

Pediatric: **Epinephrine** Auto-Injector (0.15mg) IM in the upper-outer thigh. No repeat.

Onset: 5-10 minutes

Duration: 20 minutes

Precautions:

The Epinephrine Auto-Injector is for EMERGENCY SUPPORTIVE THERAPY ONLY and not a substitute for immediate medical care. The patient must be transported immediately to the nearest emergency department if ALS response is not available or delayed.

DO NOT INJECT INTO BUTTOCKS, HANDS, FEET, OR ADMINISTER INTRAVENOUSLY. Injection into buttocks, hands or feet may result in loss of blood flow to the affected area and result in delayed absorption and tissue necrosis. Intravenous injection may result in an acute myocardial infarction or cerebral hemorrhage.

Only administer if solution is clear and not expired. A solution that is discolored, contains particles, or if outdated may be chemically altered and may lose its potency or result in muscle damage.

Note:

An Epinephrine Auto-Injector contains 2mL (2mg) of epinephrine ***1:1000***. The auto-Injector delivers 0.3mL (0.3mg); approximately 1.7mL remains in the pen after activation.

The Pediatric Epinephrine Auto-Injector contains 2mL (1mg) of epinephrine ***1:2000***. The auto-Injector delivers 0.3mL (0.15mg); approximately 1.7mL remains in the pen after activation.

Anaphylaxis may be caused by insect stings or bites, foods, drugs, other allergens, exercise, or may be spontaneous.

Signs/symptoms of anaphylaxis: flushed skin, nervousness, syncope, tachycardia, thready or unobtainable pulse, hypotension, convulsions, vomiting, diarrhea, abdominal cramps, urinary incontinence, wheezing, stridor, difficulty breathing, itching, rash, hives, and generalized edema.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

MEDICATION ADMINISTRATION
NALOXONE (NARCAN)

PERFORMANCE OBJECTIVES
Demonstrate proficiency in recognizing the indications, contraindications, and criteria for administration of intra-nasal, IM deltoid, and IM auto-injector Naloxone, which is a lifesaving medication used to reverse respiratory and central nervous system depression, a side effect from the use of opioids.

CONDITION
A simulated patient is unresponsive and has hypoventilation/agonal respirations. The student must suspect an opioid overdose. Necessary equipment will be adjacent to the simulated patient.

EQUIPMENT
Simulated patient, oxygen tank with a flow meter, bag-mask-ventilation device, blood pressure cuff, stethoscope,1, 3, 5 mL syringes, filter needle, 1-1 1/2" 21-23/gauge needle, 2mg/2mL or 1mg/1mL naloxone single dose, ampule of naloxone, nasal spray, naloxone auto-inject trainer, biohazard container, alcohol wipes, timing device, 2 X 2 sterile dressings, band aids (elastic bandages), forceps, clipboard, PCR forms, pen, goggles, masks, gown, gloves, and suction.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Assess scene safety/scene size-up ** ***Consider spinal motion restriction - if indicated***	• Look for the presence of syringes and needles or any other hazards you may encounter.
♦ Establishes body substance isolation precautions	• Mandatory personal protective equipment – gloves. • Situational - goggles, masks, gowns.
♦ Perform a primary assessment • General impression • Presence of life-threatening conditions • Assess mental status/stimulus response (AVPU) • Assess and manage the airway • Assess and manage breathing • Assess and manage circulation • Obtain an oxygen saturation reading - *if available*	• The administration of oxygen is a priority when a patient is hypo-ventilating secondary to an opioid overdose. • A goal of oxygen administration is to deliver the minimum amount of oxygen to meet the needs of the patient and to maintain an oxygen saturation level at or above 94-98%. • **SPECIAL CONSIDERATION:** For chronic obstructive pulmonary disease (COPD), the goal is to titrate oxygen to keep the SpO_2 at 88-92%. • Document the SpO_2 reading on the EMS Report or ePCR.
♦ Initiates Bag-Mask Ventilations (BMV) while preparing to administer the medication ***Administer one (1) breath every 5-6 seconds (about 10-12 per minute)***	• Patients presenting with an altered mental status and hypoventilation must receive positive pressure ventilation with a bag-mask device in order to avoid going into cardiac arrest. • High dose opioids can cause Central Nervous System (CNS) depression, that leads to respiratory and cardiac arrest. • Opioids may also be taken in combination with other drugs that further increases the respiratory depressant effect of opioids.
♦ Perform a secondary assessment: • Obtain a SAMPLE history – if possible • Perform a rapid medical exam including DCAPBTLS TIPS on each body region • Look for allergy tags (necklace or bracelets) • Obtain vital signs: Blood Pressure, pulse, and respirations	• When performing a complete body check, the EMT ***MUST USE EXTREME CARE*** to avoid the possibility of a needle sticks. • The pockets of the patient's clothing should be carefully checked prior to palpating the patient. • An important step in medication administration is to attempt to determine if the patient is allergic to any medication.

PREPARATION CONTINUED…

Skill Component	Key Concepts
♦ Verbalize the signs and symptoms of an opioid overdose: • Altered mental status • Slow, shallow, or no breathing • Small or pinpoint pupils that are same the size in each eye • Bradycardia or tachycardia • Extreme drowsiness (lethargy)	• Los Angeles County has removed the respiratory rate parameter for the administration of naloxone from Los Angeles County Reference No. 1247, Overdose/Poisoning Medical Control Guideline, the focus should be on the assessment of the patient to determine if the administration of naloxone is warranted. • Los Angeles County Reference No. 1306 states that signs and symptoms of an altered mental status include, but are not limited to: lethargy, disorientation to person, place, or time. A finding or lethargy with or without disorientation is a red flag to the possibility of an underlying serious condition. • **Some synthetic fentanyl, which are designed to mimic its pharmacological effects, (Carfentanyl) may be as much as 10,000 times more potent than morphine.**
♦ Verbalize the criteria for assisting a patient with their own emergency medication in the prehospital setting: • Prescribed to the patient • Meets indications • No contraindications • ALS unit has been requested	• If the estimated time of arrival (ETA) of the ALS unit exceeds the ETA to the most accessible receiving (MAR) facility, EMT transport is warranted. • EMTs may always assist the patient with the patient's own naloxone
♦ Verbalize the criteria for carrying naloxone on the ambulance: • The medication is in the EMTs basic scope of practice • The EMT is working, and on duty, for a provider agency that has been approved to carry and administer the medication • The indications for administration are met • There are no contraindications for administration • Advanced life support (ALS) must be enroute, and the patient must be transported to the hospital after the administration	• EMTs may carry naloxone ***ONLY*** if they are working for, and on duty, for an EMS provider agency has been approved by the local EMS Agency Medical Director to carry and administer the medication. This authorization • US Brand names - Narcan, Nalone, and Evzio • Forms supplied: o Prefilled auto injectors (IM) - 2mg/0.4mL o Single dose ampule/vial – 1 mg/mL o Preloaded nasal spray – 2mg, 4mg o Preload – 2mg/2mL • If the estimated time of arrival (ETA) of the ALS unit exceeds the ETA to the most accessible receiving (MAR) facility, EMT transport is warranted. • EMTs may always assist the patient with the patient's own Naloxone
♦ Verbalize the mechanism of action(s) for naloxone: • Naloxone reverses the effects of opioids by competing with receptor sites in the Central Nervous System (CNS) • Reverses respiratory and CNS depressant effects	• Naloxone is a medication that is used to reverse an opioid overdose. Opioids include heroin and prescription pain medications such as morphine, hydrocodone, and oxycodone. • Naloxone binds to opioid receptors in the brain and blocks the receptors from responding to the opioid.
♦ Verbalize the adult and pediatric dosages of naloxone • Adult – 2mg IM or IN • Pediatrics (Based on a formulation of 1mg/mL) 0.1mg/kg	• EMS personnel shall utilize a length based tape (i.e., Broselow) to determine weight in kilograms and color zone for children less than or equal to 14 years of age. • The formulation of the medication is the dosage form of the medication. • The maximum dosage, which may be administered to a pediatric patient is 2mg. • When administering medication to a pediatric patient, the dosage will be smaller than the adult dose. Therefore, the EMT must be knowledgeable on how to perform medicine dosage calculations.
♦ Verbalize the onset of action and duration of effects for Naloxone • The onset of action is 2-3 minutes • The duration of actions is 20-120 minutes	

Skill Component	Key Concepts
♦ Verbalize the indications for administration of Naloxone. • Suspected opiate overdose with altered mental status **AND** • Signs and symptoms of hypoventilation: - Breathing that is too slow (bradypnea) - Breathing that is too shallow (decreased tidal volume)	• Hypoventilation occurs when a patient's respiratory status is no longer capable of performing gas exchange (O_2 and CO_2). • Hypoventilation is a state where there is a decreased amount of air entering the alveolar sacs, which leads to decreased levels of oxygen and increased levels of carbon dioxide. • Causes of hypoventilation can include breathing that is too slow (bradypnea) and breathing that is too shallow (decreased tidal volume).
♦ Verbalize the <u>contraindication</u> for administration of naloxone: • Altered mental status with adequate breathing	• Like most medications, naloxone has side effects. Therefore, it should only be administered when indicated. • Naloxone may cause acute opioid withdrawal symptoms after administration. Therefore, EMTs must prepare for violent behavior after administration.
♦ Verbalize the side effects of naloxone: • Cardiovascular o Tachycardia o Hypertension o Chest pain/Angina o Arrhythmias o Increased oxygen demand • Central Nervous System o Seizures o Tremors o Anxiety/Agitation o Nervousness/restlessness • Gastrointestinal o Abdominal Pain o Nausea and Vomiting • Respiratory • Pulmonary Edema	• Naloxone may enhance the effects of endogenous epinephrine, which accounts for most of listed side effects. However, naloxone is a safe medication to administer when indicated. The advantage of preventing the need for advanced airway management techniques outweighs the disadvantages. • When an advanced life support (ALS) team must perform advanced airway techniques, ALS providers are placed at an increased risk of disease exposure.
♦ Prepare the nasal naloxone, ampule, vial, or auto injector **(DICCE):** • **D**rug name • **I**ntegrity of container/medication • **C**oncentration/Dose • **C**larity • **E**xpiration date ***** If using a pre-filled nasal spray, remove from package***	• An important step in medication preparation is to DICCE the medication by determining if: o You have the correct medication o The container does not appear to be contaminated o You are using the correct concentration and dose o The medication does not appear cloudy o The medication has not expired. • **<u>DO NOT PRIME THE DEVICE AS THIS WILL DELIVER MOST OF THE MEDICATION INTO THE AIR AND NOT THE PATIENT</u>**

PROCEDURE – MEDICATION WITHDRAWAL FROM A SINGLE DOSE AMPULE

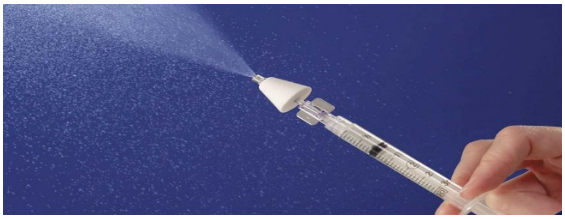
Skill Component	Key Concepts
♦ Calls for an Advanced Life Support Unit	
♦ Remove the ampule from the package and prepare to draw up the medication using a syringe with a needle	• Single dose ampule/vial-1mg/1mL • Supplies needed: o 3mL syringe o Alcohol wipe o 2X2 gauze o Filter needle – ***if using an ampule*** o 1" or 1 1/2" 21-23/gauge needle for IM injection o Intranasal Mucosal Atomization Device (MAD)
♦ Flick or tap the top of the ampule	• Tapping the top of the ampule assist in moving the medication trapped in the top of the ampule to the bottom of the ampule
♦ Withdraw the medication from an **ampule** (1mg/mL): • Break off tip of ampule using 2 X 2 gauze to protect the fingers • Attach the filter needle to the syringe • Open the safety device • Invert the vial • Insert the needle into the ampule • Withdraw the contents of the ampule into the syringe • Re-confirm that you have the correct medication by re-checking the ampule before discarding the ampule • Remove the needle and place into an approved sharps container	• Using a 2x2 assists with decreasing the possibility of being cut by the frayed pieces of glass. • If withdrawing from an ampule, the filtered needle must be removed and replace by 1" or 1 1/2" 21-23/gauge needle for IM injection • Use of a filter needle when withdrawing medication from an ampule prevents particulate such as glass particles from being drawn up into the syringe. • Using a mosquito forceps to remove the needle assists with minimizing the chance of an inadvertent needle stick.

PROCEDURE – MEDICATION WITHDRAWAL FROM A SINGLE DOSE VIAL OR MULTI-DOSE VIAL

Skill Component	Key Concepts
♦ Withdraw the medication from a **vial** (1mg/mL): • Remove the protective cap from the vial • Cleanse the top of the vial using an alcohol wipe in a circular motion inner to outer • Attach a 1-1 1/2" needle to the syringe • Pull back on the plunger of the syringe to the 1mL line to aspirate air into the syringe • Insert the needle into the vial and insert the 1mL if air into the syringe • Invert the vial, withdraw 1mL while ensuring that the tip of the needle is withdrawing the medication into the syringe, and not air. • Re-confirm that you have the correct medication by checking the vial • Remove the needle and activate the safety device – if available place into an approved sharps container	• Inserting 1mL of air into the vial with a syringe assists the medicine being aspirated into the syringe to flow freely. • Removing the needle carefully using a mosquito forceps assist with avoiding a needle stick. **DO NOT REMOVE THE NEEDLE USING YOUR FINGERS.** • The needle should be placed directly into an approved sharps container. If the container is over-stuffed with needles, replace it with a new container as over-stuffed containers may cause a needle to penetrate the plastic and cause an inadvertent needle stick. Replace the sharps disposal container when it is ¾ full.

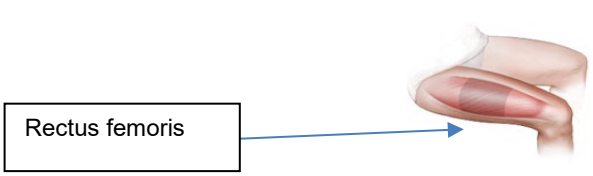
PROCEDURE – INTRANASAL MEDICATION ADMINISTRATION PREFILLED NASAL SPRAY OR PRELOAD WITH MEDICATION ATOMIZATION DEVICE (MAD)

Skill Component	Key Concepts
♦ Remove the nasal spray from the package ***– if using pre-filled nasal spray***	• Preloaded Nasal Spray – 2mg and 4mg • ***DO NOT PRIME THE DEVICE AS THIS WILL DELIVER MOST OF THE MEDICATION INTO THE AIR AND NOT THE PATIENT***

Skill Component	Key Concepts
♦ Attach the MAD device to the tip of the syringe – if withdrawing with a syringe or preload	
♦ Discontinue positive pressure ventilations and oxygen delivery - *if in progress*	
♦ Place the head in a neutral position – *if possible.*	• The head should be placed in a neutral position (A.K.A. sniffing position) • Hyper-extending the patient's neck or placing the head back causes the medication to run into the patient's mouth. Moreover, it may be difficult to determine if the patient has sustained trauma that may warrant SMR precautions.
♦ Insert the tip of the nasal spray/MAD device into the nostril and gently pull outward ensuring that the tip of the device remains parallel to the nasal septum ***Briskly depress the nasal spray OR plunger on the syringe to deliver the medication**	• Pulling outward on the nostril with the tip of the nasal spray enlarges the nares to create more surface area for medication absorption.
♦ Resume and continue BMV ventilations - *if indicated*	• Resuming positive pressure ventilation assists with medication absorption along with providing oxygen to the patient
♦ Discard the nasal spray in an appropriate container	
♦ Discard the syringe into a sharps container	
♦ Evaluate the response to the medication • Respiratory status • Level of consciousness	• Signs and symptoms of an improved respiratory status includes: • Increased respiratory rate • Increased tidal volume • Improved SpO2 reading • Skin signs are returning to normal

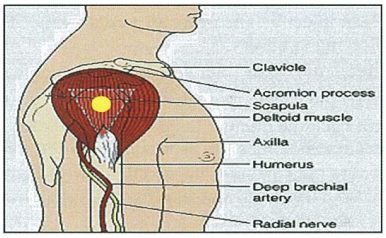
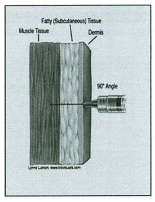
PROCEDURE
INTRAMUSCULAR THIGH INJECTION AUTO-INJECTOR

Skill Component	Key Concepts
♦ Remove and/or cut clothing to expose the thigh	
♦ Describe the areas that should be avoided when administering an IM injection: • Bruised • Scarred • Areas that have superficial blood vessels	• It is common to find areas on the patient's body where the veins are very darkened, which is due to scarring and the buildup of toxins along the length of the vein. These darkened areas are known as "track marks."

♦ Identifies the correct location of the injection site  	• Naloxone auto-injectors **MUST BE ADMINISTERED IN THE THIGH ONLY**. • The rectus femoris lies over the femur. When using this location, place the injection in the center of the muscle at approximately the level of the mid-shaft femur. • Thigh Injections require that long pants be removed, thereby exposing EMTs to inadvertent needle sticks so use extreme caution while removing the pants. • While literature states that a naloxone auto-injector may be administered through pants, this is not recommended in Los Angeles County.
♦ Cleanse the injection site with alcohol wipe *****Cleanse in a circular motion from inner to outer***	• Cleansing the injection site is accomplished by using an alcohol wipe in a circular motion, from inner (closest to the injection site) to outer.
♦ Remove the safety cap from the auto-injector	• Placing fingers at the end of the safety cap is hazardous as any pressure on this end may inadvertently trigger the injector device.
♦ Place the tip of the auto-injector at a 90° angle against the site of injection and	• The auto-injector must be placed perpendicular to the thigh (90° angle).
♦ Apply pressure to the tip of the auto-injector to activate the device	• Pressure must be applied on the tip of the auto-injector in order to activate the device.
♦ Continue to hold the auto-injector in place for 3 seconds to ensure all of the medication has been delivered *****Apply an adhesive bandage (Band-Aid)***	• An advantage of IM administration of naloxone is that positive pressure ventilations may continue while the medication is being administered.
♦ Discard the auto-injector into a sharps container	• Replace the sharps disposal container when it is ¾ full. An over-stuffed sharps container can lead to needles puncturing through the plastic and causing an inadvertent needle stick.
♦ Evaluate the response to the medication • Improved respiratory status • Improved level of consciousness	• Signs and Symptoms of an improved respiratory status includes: - Increased respiratory rate - Increased tidal volume - Improved SpO2 reading - Skin signs are returning to normal • Naloxone may cause acute opioid withdrawal symptoms after administration. Therefore, EMTs must prepare for violent behavior after administration.

PROCEDURE
INTRAMUSCULAR DELTOID INJECTION USING A SYRINGE

Skill Component	Key Concepts
♦ Remove and/or cut clothing to expose the upper arm	• The deltoid muscle is the preferred IM injection over the thigh. This is based upon principles of rescuer safety. • Injections in the thigh require that long pants be removed, thereby exposing EMTs to inadvertent needle sticks. • Naloxone auto-injectors must be administered in the thigh region only.

Skill Component	Key Concepts
♦ Identify the location of the deltoid muscle and the intramuscular injection (IM) site: • Locate the acromion process with index finger and leave in place (the bony protuberance of the shoulder) • Locate the Injection site: ○ 3 to 4 finger-breaths below the acromion process 	• The acromion process is also known as the acromial process and is a bony process on the scapula. • IM injections administer medication into the muscle which is very vascular and permits systematic deliver at a moderate absorption rate. • If the fingers are small, (women) use four (4) fingers (one (1) on the acromion process and three (3) to measure just below the index finger. For males with large fingers, place the index finger on the acromion process and then lay two (2) fingers just below the index finger. If the patient has a larger deltoid muscle, use an additional finger as a guide. The proper injection site will be located just below the last finger used. • An IM injection penetrates the dermal and subcutaneous tissue. • The deltoid muscle is very vascular and permits easy absorption. • Use extreme caution to avoid inadvertent needle sticks when exposing the deltoid area. • For administration of naloxone, the deltoid muscle is preferred over the thigh muscle because removal of the patient's pants could subject an EMT to an inadvertent needle stick.
♦ Cleanse the injection site with alcohol wipe ***Cleanse in a circular motion from inner to outer***	• Cleansing the infection site is accomplished by using an alcohol wipe in a circular motion, from inner (closest to the injection site) to outer.
♦ Remove the cap on the needle	
♦ Stretch the skin taut with your non-dominant hand	• Making the skin taut is accomplished by using the thumb and index finger on your non-dominant to stretch the skin on the deltoid region.
♦ Insert the needle into the skin at a 90° angle 	• An advantage of IM administration of naloxone is that positive pressure ventilations may continue while the medication is being administered.
♦ Pull back on the plunger (aspirate) on the syringe to check for the presence of blood in the syringe ***If blood appears in the syringe, withdraw the syringe, activate the safety device on the needle and dispose into a sharps container – if applicable***	• If blood appears, the needle is in a blood vessel. Withdraw the needle from the deltoid muscle and discard the syringe and needle into an appropriate sharps container. • If no blood appears in the syringe, continue with the medication administration.
♦ Inject the medication slowly by depressing the plunger until the syringe is empty	
♦ Remove the needle and activate the safety device on the needle	• If a safety cap does not exist on the needle, **DO NOT RECAP THE NEEDLE.** Place the needle and syringe directly into a sharps container. • Replace the sharps disposal container when it is ¾ full. An over-stuffed sharps container can lead to needles puncturing through the plastic and causing an inadvertent needle stick.

Skill Component	Key Concepts
♦ Apply pressure to the injection site with opposite hand using a sterile 2X 2 sterile if puncture site is bleeding ***** Apply an adhesive bandage – if indicated***	• Patients who abuse narcotics may have hepatitis and be HIV positive. The blood clotting factors that are produced in the liver may be affected, which will lead to prolonged blood clotting.
♦ Place the syringe and needle into an appropriate sharps container	• Replace the sharps disposal container when it is ¾ full. An over-stuffed sharps container can lead to needles puncturing through the plastic and causing an inadvertent needle stick.
♦ Evaluate the response to the medication • Improved respiratory status • Improved level of consciousness	• Signs and symptoms of an improved respiratory status includes: - Increased respiratory rate - Increased tidal volume - Improved SpO2 reading - Skin signs are returning to normal • Naloxone may cause acute opioid withdrawal symptoms after administration. Therefore, EMTs must prepare for violent behavior after administration.

RE-ASSESSMENT
PATIENT REPORT &DOCUMENTATION
(Ongoing Assessment)

Skill Component	Key Concepts
§ Repeat an ongoing assessment a minimum of every **5 minutes**: • Primary assessment • Relevant portion of the secondary assessment • Vital signs • SPO_2 • Breathing – rate, depth, tidal volume *****Manage patient's condition as indicated*** *****Administers a second dose- if indicated***	• Patients displaying signs and symptoms of hypoventilation associated with a narcotic overdose are unstable patients. • Unstable patients are those who have abnormal vital signs, S/S of poor perfusion, if there is a suspicion that the patient's condition may deteriorate, or when the patient's condition changes. • Since the duration of action of naloxone is anywhere between 20-120 minutes, there may be times when the ETA for the responding ALS unit is delayed or the ETA to the most accessible receiving facility is prolonged beyond the duration of the medication. Therefore, the respiratory status of the patient must be monitored closely. • Patients must be re-evaluated at least every 5 minutes if any treatment was initiated, medication was administered. • Naloxone may cause acute opioid withdrawal symptoms after administration. Therefore, EMTs must prepare for violent behavior after administration. • Certain opioids require higher doses of naloxone to reverse the respiratory depressive effects stronger. The recent literature suggests that Carfentanyl may be 100 X stronger than Fentanyl and 10,000 times stronger than Morphine. • Evaluating and comparing results from a previous assessment assists with recognizing whether if the patient's condition is improving or deteriorating. ***NOTE:*** ***EMTs may administer one (1) additional dose of naloxone in the opposite nostril if the patient's respiratory status did not improve from the first dose within 2-3 minutes if advanced life support (ALS) has not arrived on scene, OR the ETA of the most appropriate Emergency Department exceeds the ETA of the responding ALS Unit.***

Skill Component	Key Concepts
§ Verbalize/Document • Assessment findings before and after administration • Drug - name - dose - route - site - time - who administered medication • Patient's response to medication • Respiratory status • Cardiovascular status • Mental status • Vital signs: Blood pressure, pulse, and respirations • SpO_2	• Documentation must be completed on a Los Angeles County EMS Report Form, a provider Patient Care Record form or ePCR. • Documenting reassessment information provides a comprehensive picture of patient's response to treatment. • Last reassessment information (before patient care is transferred) should be documented in the appropriate section of the EMS Report.

Developed 7/2017; Revised 11/2018

Naloxone Hydrochloride

Narcan®, Nalone®,Evzio® , Narcanti®

Classification: Opioid (narcotic) Antagonist

Actions:

- Binds to opioid receptors and blocks the receptors preventing the body from responding to opiates and endorphins.
- Reverses depression of the:
  - central nervous system
  - respiratory system
- Reverses hypotension in narcotic overdose

Indications: Suspected narcotic overdose with a respiratory rate < 8/minute and/or decreased tidal volume

Contraindications: None in prehospital care

Adverse Effects:

- *Cardiovascular*
  tachycardia/bradycardia
  hypertension/hypotension
  sudden chest pain
  dysrhythmias
- *Respiratory*
  respiratory depression
  pulmonary edema
- *Neurological*
  seizure
  headache
  irritability/anxiety
  tinnitus
- *Gastrointestinal*
  nausea/vomiting
  abdominal pain

Administration: 2mg IM via auto-injector in the upper-outer thigh or
2mg IN via atomizer (1mg in each nostril). No repeat administration

Pediatric: Not recommended for pediatrics in prehospital care for EMTs

Onset: Within 5-10 minutes (metabolized in the liver and excreted by the kidneys)

Duration: 20 minutes-90 minutes (1 ½ hour)

Prehospital Consideration:

- Observe patient's respirations closely since naloxone wears off before narcotic and the patient's respirations may decrease again.
- Withdrawal may occur within minutes and subsides in about 2 hours.
- Severity and duration of withdrawal symptoms is related to dose, route, and type of opioid dependence.
- Acute withdrawal symptoms may include: body aches, fever, sweating, runny nose, sneezing, piloerection, yawing, weakness, shivering/trembling, nervousness, restlessness/ irritability, diarrhea, nausea/vomiting, abdominal cramps, increased blood pressure, and tachycardia,
- Prepare for possible violent behavior since it may cause acute withdrawal symptoms when given to a narcotic addict.
- Call ALS for administration of additional naloxone and medical care.
- Does not reverse effects of other drugs such as benzodiazepines (e.g. Xanax®, Klonopin® and Valium®), bath salts, cocaine, methamphetamine or alcohol.

Precautions:

Naloxone is for EMERGENCY SUPPORTIVE THERAPY ONLY and not a substitute for immediate medical care. The patient must be transported immediately to the nearest emergency department if ALS response is not available or delayed.

Developed 1/15

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

MEDICATION ADMINISTRATION
NITROGLYCERIN

PERFORMANCE OBJECTIVES
Demonstrate proficiency in recognizing the indications, contraindications and criteria, and assist the patient with the administration of nitroglycerin, a prescribed emergency medication.

CONDITION
Establish that a simulated patient, complaining of substernal chest discomfort that is suspected to be cardiac related, meets the criteria for administration of nitroglycerin and will assist the patient by administering either the nitroglycerin spray or tablet. Necessary equipment will be adjacent to the simulated patient.

EQUIPMENT
Simulated patient, oxygen tank with a flow meter, oxygen mask, blood pressure cuff, stethoscope, placebo nitroglycerin spray and tablets, timing device, clipboard, pen, PCR forms, goggles, masks, gown, gloves.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions	• Mandatory personal protective equipment - gloves • Situational - goggles, masks, gown
♦ Complete primary assessment: • General impression • Life-threatening condition • Assess mental status/stimulus response (AVPU) • Assess/Manage airway • Assess/Manage breathing • Rapid chest auscultation • Assess/Manage circulation ***Administer oxygen per Los Angeles County EMS Agency Reference No. 1304***	• Use the most effective oxygen delivery system that can be tolerated by the patient, if indicated. • Assess breathing for rate, rhythm, quality of respirations and perform a rapid chest auscultation to assess initial breath sounds. ➢ For patients with a history of chronic obstructive pulmonary disease (COPD), the goal is to titrate oxygen to keep the SpO_2 at 88-92%. ➢ AVPU stands for: ➢ **A**lert - The patient's eyes are open as you approach him/her ➢ Responsive to **V**erbal – The patient is not alert and only opens his/her eyes when you speak to them. ➢ Responds to **P**ain/noxious stimulus – The patient does not respond to your voice but does respond to noxious stimulus. The response is either purposeful or non-purposeful. (See text for methods of noxious stimulus). ➢ The patient is **U**nresponsive – The patient does not respond to anything. The patient is unconscious/comatose.
♦ Complete the appropriate secondary assessment ** Obtains vital signs ** Assess the patient's level of pain ** Performs a focused exam of the patient's chest	• During the secondary assessment, a complete set of vital signs (VS) must be obtained. This establishes baseline VS from which re-assessment information can be compared. • The appropriate secondary assessment is to perform a "focused exam of the chest" provided there are no signs of trauma or the patient is unconscious and unresponsive. • Use the appropriate pain scale for the patient. In the adult, use a pain scale of 0-10 to rate pain/discomfort. (0 being no pain and 10 being the most pain).
♦ Verbalize the criteria for assisting patients with their own emergency medications: • The medication was prescribed by a physician • The medication is prescribed for the patient • The indications for administration are met • There are no contraindications	• EMTs may *only* assist with administration of nitroglycerin (NTG) as per Reference 802 – Los Angeles County Emergency Medical Technician Scope of Practice. • EMTs may NOT carry NTG tablets or spray, but may assist with the patient's *own* prescribed medication. • In life-threatening situations, an ALS Unit must be enroute or BLS should consider transport to an appropriate medical facility, if ALS arrival is longer than transport time

Skill Component	Key Concepts
♦ Verbalize the <u>indications</u> for assisting the patient with NTG: • Chest pain suspected to be myocardial in origin • Systolic blood pressure > 90mm/Hg	• Use the appropriate pain scale for the patient. In the adult, use a pain scale of 0-10 to rate pain/discomfort. (0 being no pain and 10 being the most pain). • Any degree of chest pain/discomfort that is suspected to be cardiac origin should be treated with NTG regardless how the patient rates the pain.
♦ Verbalize the <u>contraindications</u> for administration of NTG: • Patient does not meet indications/criteria for administration • Patient has taken three (3) doses before EMS arrival • Last dose was taken < 5 minutes ago • Systolic blood pressure < 100mm/Hg • Used sexual enhancing/erectile dysfunction drugs within 48 hours	• If last dose of NTG exceeds five (5) minutes, NTG may be administered. • If the patient insists on taking NTG and <u>contraindications exist</u>, the EMT should **NOT** assist in the administration, but document the patient's actions.

PROCEDURE

Skill Component	Key Concepts
♦ Check medication for: • **D**rug name • **I**ntegrity of container/medication • **C**oncentration/Dose • **C**larity • **E**xpiration date	• <u>Drug name</u> - Trade names for NTG may include: Nitrocot, Nitrobid, Nitro-Mist, Nitro-Par, Nitro-Time, Nitorglyn E-R, Nitrolingual Spray, Nitroquick, Nitrostat, Nitrotab, etc. • <u>Integrity of container/medication</u> - container is NOT broken and the tablet is intact • <u>Concentration/Dose</u> - dose of NTG is 0.4mg per tablet. • <u>Clarity</u> - not applicable to tablets or unable to see liquid in spray container • <u>Expiration date</u> - not to be administered after this date
♦ Obtain a blood pressure reading	• NTG may cause hypotension due to vasodilation. Always take blood pressure before administration and five (5) minutes after administration. **DO NOT** administer if systolic blood pressure is < 90mm/Hg.
♦ Prepare Medication: **<u>Tablet</u>** • Remove tablet from container and check that it is intact **<u>Spray</u>** • Remove top of spray canister	• Gloves should be worn when administering NTG tablet or spray since medication may be absorbed through the skin. **<u>Tablet</u>** • Make sure that tablet is intact for administration of the correct dose. • **DO NOT** contaminate the medication. Pour tablet into lid of container then into the palm for administration **<u>Spray</u>** • One spray delivers 0.4mg of NTG. **<u>DO NOT</u>** shake the container since this will alter the dose. • Ensure that spray opening is pointed toward patient.
♦ Remove the oxygen source –if in place	
♦ Instruct the patient to open their mouth and lift their tongue	
♦ Administer medication: **<u>Tablet</u>** • Place tablet under patient's tongue • Instruct patient to allow tablet to dissolve and **NOT** to swallow for 10 seconds after the tablet has dissolved **<u>Spray</u>** • Deliver one (1) spray sublingually or trans-mucosal • Instruct patient NOT to inhale spray	**<u>Tablet</u>** • If the patient swallows the tablet it will change the absorption rate and the amount of drug that is absorbed. Sublingual absorption is faster than gastrointestinal absorption. **<u>Spray</u>** • If the patient inhales the spray it will change the absorption rate and the amount of drug that is absorbed. • Sublingual and trans-mucosal absorption is faster and more accurate than inhaling NTG into the lungs.
♦ Replace the oxygen source – if indicated	

Skill Component	Key Concepts
♦ Re-assess the blood pressure and pain scale in five (5) minutes ** ***Place patient in supine position - <u>if indicated</u>***	• Use the appropriate pain scale for the patient. In the adult, use a pain scale of 0-10 to rate pain/discomfort. (0 being no pain and 10 being the most pain). • NTG may cause hypotension due to systemic vasodilation. Always take blood pressure before administration and 5 minutes after administration. • EMTs may administer up to three (3) NTG doses if the patient has not taken the medication and blood pressure remains > 90mm/Hg. • Three (3) doses of NTG include the number of doses taken by the patient prior to the arrival of EMS. • NTG administration is for **<u>EMERGENCY SUPPORTIVE THERAPY ONLY</u>** and is not a substitute for immediate medical care. • In life-threatening situations, an ALS Unit <u>must</u> be enroute or the BLS unit should consider transport to the most appropriate emergency department.

REASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
♦ Repeat an ongoing assessment a minimum of every five (**5) minutes**: • Primary assessment • Relevant portion of the secondary assessment • Vital signs: BP, Pulse, Respirations • Pain scale	• Unstable patients are patients who have abnormal vital signs, S/S of poor perfusion, if there is a suspicion that the patient's condition may deteriorate, or the patient's condition changes.
♦ Evaluate response to treatment and if needed administer another dose in five (5) minutes to a maximum of three (3) doses (includes the patient's dose)	• Patients must be re-evaluated at least every five (5) minutes if treatment was initiated, medication was administered, or a there is a change in the patient's condition, or is anticipated. • Do Not re-administer if systolic blood pressure is < 90mm/Hg. • Three (3) doses of NTG include the number of doses taken by the patient prior to the arrival of EMS. • Evaluating and comparing results assists in recognizing if the patient is improving, responding to treatment or condition is deteriorating
§ Continue O2 therapy, if indicated, until the transfer of patient care has occurred	• Once oxygen therapy has been initiated, it should **NOT BE** discontinued until the transfer of patient care has occurred.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Verbalize/Document • Assessment findings before and after administration - pain - respirations • Blood pressure before administration • Drug - name - dose - route - site - time - who administered medication • Patient's response to medication • Blood pressure five (5) minutes after administration	• Documentation must be on either the Los Angeles County EMS Report, ePCR, or departmental Patient Care Record form. • Document administration <u>only</u> in the comment section on the Los Angeles County EMS Report. • Documenting reassessment information provides a comprehensive picture of patient's response to treatment. • If the patient insists on taking NTG and <u>contraindications exist</u>, EMTs should **NOT** assist in the administration, but document the patient's actions.

Developed: 1/02 Revised 9/2018

MEDICATION ADMINISTRATION

NTG

Supplemental Information

DEFINITIONS:

- Sublingually - medication administration under the tongue
- Trans-mucosal - medication route on top of tongue or mucus membrane in the mouth (buccal cavity)

ASSESSMENT: PAIN/DISCOMFORT (non-traumatic):

- ***O**nset* - when the pain/discomfort first began (minutes - weeks)
- ***P**rovoking* - causative event and what increases pain/discomfort
- ***Q**uality* - type of pain, i.e. sharp, dull, aching, squeezing, burning, crushing, tearing, throbbing, etc.
- ***R**egion* - area local vs. diffuse pain/discomfort
- ***R**adiation* - pain moves to another area, away from its origin;
- ***R**elief* - constant vs. intermittent; what makes it better or worse
- ***S**everity* - 0-10 scale used to rate initial event or compare to previous episode or ongoing assessment
- ***T**ime* - duration

NITROGLYCERIN

TABLETS or LINGUAL AEROSOL

Nitrolingual® Spray, Nitrocot[7], Nitrobid[7], Nitro-Mist[7], Nitro-Par[7], Nitro-Time[7], Nitorglyn E-R[7], Nitroquick[7], Nitrostat[7], Nitrotab

Classification: ⊄ Vasodilator

Actions: ⊄ Dilates blood vessels

⊄ Dilates coronary arteries

⊄ Decreases the workload of the heart

Indications: ⊄ Chest pain

Contraindications: ⊄ Blood pressure below 100 systolic

⊄ Patient has taken three doses or a dose less than 5 minutes prior to the arrival of EMS providers

⊄ Sildenafil citrate (Viagra®) tadalafil (Cialis[7]), vardenafil (Levitra[7]) or similar medication taken within 48 - 72 hours

⊄ Head injury⊄

Adverse effects:

Cardiovascular
- hypotension
- bradycardia
- reflex tachycardia
- rebound hypertension

Gastrointestinal
- nausea/vomiting
- dry mouth

Neurological
- throbbing headache
- dizziness/faintness
- confusion
- blurred vision

General
- flushed skin
- sublingual burning

Administration: **EMT providers are not authorized to carry nitroglycerin tablets or aerosol, but may assist patients with their own physician prescribed medication.**

Tablet 1 tablet (1/150gr or 0.4mg) SL
Spray 1 spray (0.4mg) SL or TM (transmucosal)

Pediatric: Not recommended for prehospital use

Onset: 1-3 minutes; Peaks in 5-10 minutes

Duration: 30-60 minutes

Precautions:

Nitroglycerin administration is for EMERGENCY SUPPORTIVE THERAPY ONLY and not a substitute for immediate medical care. The patient must be transported immediately to the nearest emergency department if ALS response is not available or delayed.

DO NOT ADMINISTER IF SYSTOLIC BLOOD PRESSURE IS BELOW 100. May cause hypotension due to systemic vasodilation. Always take blood pressure before and 5 minutes after administration of Nitroglycerin.

DO NOT SHAKE CONTAINER. One spray delivers 0.4mg of nitroglycerin. If the container is shaken it will alter the dose delivered.

INSTRUCT PATIENT NOT TO INHALE SPRAY. Inhaling spray affects absorption rate.

Directions for Administering Nitroglycerin Tablets

1. DO NOT ADMINISTER IF SYSTOLIC B/P IS BELOW 100. Take blood pressure before administration.
2. Place tablet under tongue and instruct patient not to swallow or chew, but to allow tablet to dissolve under tongue.
3. Retake blood pressure and pulse after 5 minutes and reassess pain. If hypotension develops, place patient in shock position.

Directions for Administering Nitroglycerin Aerosol

1. DO NOT ADMINISTER IF SYSTOLIC B/P IS BELOW 100. Take blood pressure before administration.
2. Instruct patient not to inhale spray and do not shake container.
3. Administer spray on or under the tongue.
4. Retake blood pressure and pulse after 5 minutes. If hypotension develops, place patient in shock position.

Revised 4/19, 4/11

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

PATIENT ASSESSMENT & MEDICATION ADMINISTRATION
ORAL GLUCOSE

PERFORMANCE OBJECTIVES
Demonstrate proficiency in recognizing the indications, contraindications, and criteria for administration of oral glucose administration for a patient having an altered level of consciousness and a suspected history of diabetes.

CONDITION
Establish that a simulated patient with an altered level of consciousness who meets the criteria for administration of oral glucose and Necessary equipment will be adjacent to the simulated patient.

EQUIPMENT
Simulated patient, oxygen tank with a flow meter, oxygen mask, blood pressure cuff, stethoscope, glucose solution, tube of glucose paste/gel/gel, tongue blade or bite stick, timing device, clipboard, PCR forms, pen, goggles, masks, gown, gloves.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establishes body substance isolation precautions	• Mandatory personal protective equipment - gloves • Situational - long sleeves, goggles, masks, gown
♦ Complete a primary assessment • General impression • Life-threatening condition • Assess mental status/stimulus response (AVPU) • Assess/Manage airway • Assess/Manage breathing • Obtain an oxygen saturation (SpO_2) reading – if available ** ***Administer high flow oxygen – if indicated***	• A goal of oxygen administration is to deliver the minimum amount of oxygen to meet the needs of the patient and to maintain an oxygen saturation level at or above 94%. • When available, use pulse oximetry to guide oxygen delivery. The desired SpO_2 for most non-critical patients is 94-98%. • **SPECIAL CONSIDERATION:** For chronic obstructive pulmonary disease (COPD), the goal is to titrate oxygen to keep the SpO_2 at 88-92%. • Document the SpO_2 reading on the EMS Report or ePCR.
♦ Complete a secondary survey: • Obtains vital signs • Obtains an oxygen saturation (SpO_2) reading – if available	• Obtaining and documenting a baseline set of vital signs assists with determining if the patient is improving or deteriorating after medication delivery.
♦ Verbalize the indications for administration of oral glucose solution or glucose paste/gel: • Blood glucose reading is < 60mg/dL OR • Suspected hypoglycemia - The patient has an altered level of consciousness - The patient has a history of diabetes - The patient has the ability to swallow	• An oral dextrose solution can be any beverage that contains sugar such as milk, juice, honey, and soda. • Other forms of glucose include gel, tablets, or one (1) tablespoon of granulated sugar or honey. Three (3) packets of sugar or three (3) sugar cubes equal one (1) tablespoon. • Local protocols will dictate the level of the blood glucose level that must treated. In Los Angeles County, the blood sugar level is < 60mg/dL. • If a glucometer is not available, oral glucose should still be administered if the EMS provider suspects the patient to be hypoglycemic.
♦ Verbalize the contraindications for oral glucose solution or oral glucose paste/gel • Blood glucose reading is > 60mg/dL • Unconscious (relative) • No history of diabetes • Unable to swallow (relative)	• Glucose paste/gel may still be administered to a suspected hypoglycemic patient who is unable to swallow or is unconscious. See glucose paste/gel administration. • A relative contraindication means that caution should be used if the condition exists.

ADMINISTRATION OF DEXTROSE SOLUTION	
Skill Component	**Key Concepts**
♦ Explain the procedure to the patient	• Providing an explanation of the procedure aids the patient cooperation.
♦ Instruct the patient to hold the container and drink the entire contents	• If the patient is not alert enough to hold the container, the dextrose solution cannot be administered.
♦ Reassess the patient's level of consciousness	• It may take up to 20 minutes to see the full effect of glucose administration.

ADMINISTRATION OF GLUCOSE PASTE/GEL	
Skill Component	**Key Concepts**
♦ Place the patient in left lateral position – if semi-conscious or unconscious	• Placing a semi-conscious/unconscious patient in left lateral position decreases the chances of aspiration based upon the position of the stomach.
♦ Apply one (1) inch of glucose paste/gel onto a tongue depressor or bite stick	• While there are no side effects associated with the administration of oral glucose, due to the viscosity and thickness of the gel, airway obstruction is possible. • Placing a large amount of glucose paste/gel onto a tongue depressor or bite stick can lead to aspiration.
♦ Pull the patient's cheek back with one (1) hand	• Use caution to avoid being bitten by the patient.
♦ Insert the tongue blade or bite stick into the patient's mouth	• If the patient has a seizure, remove the tongue depressor immediately. • Use caution to avoid getting bitten.
♦ Re-apply/smear the 1 inch of glucose paste/gel between the patient's cheek and gum until the entire tube is administered	• One (1) full tube equals one (1) dose. • Lightly messaging the area between the cheek and gum assists with dispersing the gel and increasing the rate of absorption.
♦ Reassess the patient's level of consciousness	• It may take up to 20 minutes to see the full effect of glucose administration.

REASSESSMENT (Ongoing Assessment)	
Skill Component	**Key Concepts**
♦ Repeat an ongoing assessment at least every **5 minutes**: • Primary assessment • Relevant portion of the secondary assessment • Vital signs • Pain Scale	• A patient with an altered mental status must be re-assessed every 5 minutes. • The purpose of the ongoing assessment is to recognize signs and symptoms of improvement or deterioration of the patient's condition.
♦ Evaluate response to treatment	• Patients with hypoglycemia who are successfully treated with oral glucose who then refuse transport, should be discouraged from doing so if they have: abnormal vital signs, fever, are taking oral or long acting medications including insulin, a history of alcohol abuse, possible ingestion or poisoning, or they do not have a history of diabetes. This is because these patients are at high risk for recurrent hypoglycemic episodes. • Evaluating and comparing results from a prior assessment assists with evaluating if the patient is improving, deteriorating, or responding to treatment.

PATIENT REPORT AND DOCUMENTATION	
Skill Component	**Key Concepts**
§ Verbalize/Document • Assessment findings before and after administration • Drug - name - dose - route - site - time - who administered medication • Patient's response to medication • Respiratory/Cardiovascular status • Mental status • Vital signs	• Documentation must be on either the Los Angeles County EMS Report, departmental Patient Care Record form, or ePCR. • Document administration only in the comment section on the Los Angeles County EMS Report, • Documenting re-assessment information provides a comprehensive picture of patient's response to treatment. • Last re-assessment information (before patient care is transferred) should be documented in the appropriate section of the EMS form.

Developed: 10/2017

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

ADMINISTRATION OF ORAL GLUCOSE

Supplemental Information

DEFINITION:

Diabetes mellitus (DM): Diabetes is a metabolic disorder in which the body is in-capable of metabolizing simple carbohydrates (glucose). Mellitus is a Greek word meaning "sweet." It is a reference to the presence of glucose spilling out of the kidneys into the urine.

ASSESSMENT: ALTERED LEVEL OF CONSCIOUSNESS / SEIZURE / WEAKNESS / DIZZINESS / SYNCOPE

- Causative event and if acute or chronic
- Time of onset
- Duration of event
- Orientation level (name, place, and time)
- Associated symptoms (neuro deficits, pupil response)
- Position found in
- Length of time unconscious
- Incontinence
- Dysrhythmia
- Possible causes: (not all inclusive)

  - **A** alcohol, anoxia, allergic reaction, arrhythmia (dysrhythmia)
  - **E** epilepsy, electrolyte imbalance
  - **I** insulin (hyper-hypoglycemia)
  - **O** overdose
  - **U** uremia, under-dose
  - **T** trauma
  - **I** infection
  - **P** psychiatric, post-ictal, poisoning (ingestion, inhalation), palpitation (dysrhythmias)
  - **S** stroke

NOTES:

- Glucose is the basic sugar in the body. Glucose and oxygen are the primary fuels required by the body for cellular metabolism.
- Adults with diabetes have a higher incidence of kidney failure and heart disease. It also effects walls of vessels and leads to a condition known as microangiopathy. Diabetes also leads to nerve damage, which results in the loss of function and feeling to the areas innervated by that nerve. Couples with vessel damage, these patients' wounds may occur that are not noted at the time and left uncared for they lead to gangrene of the affected extremity. Approximately 60% of amputations are attributed to Diabetes.
- Insulin is a hormone that is produced by specialized cells in the pancreas called the islets of Langerhans. These cells become damaged from viruses or over-consumption of sugar over years and the result is ceased or decreased production of insulin. The only cells in the body that are not dependent upon insulin to facilitate glucose from moving in to the cells are the brain cells.
- There are two (2) forms of diabetes mellitus: type 1 and type 2. Both types result in very serious medical conditions that can be life-threatening.
- Type 1 diabetes was once referred to as "juvenile onset" diabetes because it typically occurs during childhood. Type 2 diabetes has been called "adult onset" because it typically manifests itself during adulthood. Type 1 diabetes always requires insulin while type 2 can be managed by oral medication or insulin, or a combination of both.
- Diabetes is characterized by:
  - Polyphagia – increased hunger due to the inability to transport glucose into the cell
  - Polydipsia – increased thirst due to large fluid losses caused by diuresis
  - Polyuria – increased urine output due to water being attracted to the excess glucose and diuresis
- EMTs may carry a glucometer on the ambulance if it they are employed by, and are on duty for, a Provider Agency that has been approved by the Los Angeles County EMS Medical Director.
- In life-threatening situations, an ALS Unit must be enroute or BLS should consider transport if ALS arrival is longer than transport time.

FINGER STICK BLOOD GLUCOSE TESTING & ORAL GLUCOSE DELIVERY

Supplemental Information

- Examples of oral medications used to treat Type 2 diabetes:

  - Metformin (Glucophage)
  - Sitagliptin (Januvia)
  - Rosiglitazone (Avandia)
  - Pioglitazone (ACTOS)
  - Chlorpropamide (Diabinese)
  - Glyburide (Micronase)

- Examples of insulin used to treat Type 1 diabetes:

  - Humulin
  - Novolog
  - Lantus
  - Novolin
  - Exubera
  - Apidra
  - Toujeo
  - Tresiba
  - Levemir

MEDICATION INFORMATION: ORAL GLUCOSE PASTE/GEL

- **Medication Name:**

  - Glutose
  - Insta-Glucose

- **Indications:**

  - Altered menal status
  - Hx of Diabetes
  - Blood glucose < 60mg/dL
  - The ability to swallow

- **Contraindications:**

  - Unresponsive
  - Unable to swallow
  - Blood glucose > 60 mg/dL

- **Dosage:**

  - One (1) tube

MEDICAL CONTROL GUIDELINE: HYPOGLYCEMIA

PRINCIPLES:

1. Hypoglycemia is generally defined as a blood glucose level less than 60mg/dL.

2. Hypoglycemia should be suspected in any patient with behavioral changes or altered level of consciousness.

3. Hypoglycemia should be considered in any diabetic patient with an acute medical complaint.

4. Hypoglycemia is a true medical emergency that requires the prompt administration of glucose or glucagon to prevent brain damage or death.

GUIDELINE:

1. Perform a blood glucose test and document results on any patient with suspected hypoglycemia.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

GENERAL PHARMACOLOGY FOR EMTs

Upon completion of this unit of instruction, the student will be able to:

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
1. Explain the rationale for an EMT to assist or allow the patient to self-administer specific medications prior to the arrival of ALS.	*Rationale for an EMT to assist or allow patient to administer medications prior to ALS arrival:* • Administration of a specific medication prior to the arrival of ALS may be a lifesaving measure.	
2. Discuss the risk associated with administration of medications.	*Risk associated with administration of medications:* • The risk of administration of any medication is that it may result in a life-threatening response if administered incorrectly.	
3. Discuss the criteria for EMTs to allow the patient to self-administer or assist the patient with a prescribed emergency medication in Los Angeles County.	*Administration criteria:* • Medication is prescribed by a physician • Medication is prescribed for the patient • Meets indication for administration • No contraindications are present	• EMTs may only assist with administration of prescribed emergency medications used for relief of acute symptoms. • Administration must meet the specific parameters required for each medication eg. Nitroglycerin - patient has a systolic BP >100mg/Hg, and has NOT taken 3 doses prior to EMT arrival.
4. Identify the medications that may be carried on BLS Units per the National EMT Scope of Practice.	*The National Scope of Practice allows for:* • Oxygen • Oral glucose • Aspirin for chest pain of suspected ischemic origin	• Activated charcoal is not in the current National, California and Los Angeles County Scope of Practice.
5. Identify which medications are carried on BLS Units in Los Angeles County.	*Medications carried on BLS Units in Los Angeles County:* • Oxygen • Oral glucose • Aspirin for chest pain of suspected ischemic origin	• There are no other emergency medications that can be carried on a Los Angeles County BLS Unit. The only medications that should be carried are oxygen, oral glucose, and aspirin. • No other medications may be carried on a BLS Unit in Los Angeles County such as activated charcoal, aspirin and EpiPen, albuterol and nitroglycerine.

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
6. Identify the prescribed emergency medications that the EMT may assist a patient with or allow the patient to self-administer.	*Prescribed emergency medications EMTs may assist with in Los Angeles County:* • Any patient physician prescribed emergency medications including: - Bronchodilator inhaler and nebulizer - Epinephrine auto-injection device - Nitroglycerin tablet or spray - Aspirin - Naloxone (if approved)	• Medications included in the Los Angeles County EMT Scope of Practice Reference No. 802 - Emergency Medical Technician Scope of Practice. • All administration criteria must be met for EMTs to assist a patient with prescribed emergency medications. • Public Providers or Ambulance Companies must have special approval from the EMS Agency to carry and administer naloxone.
7. List the seven most common medication categories that EMS providers may encounter in the field.	The seven most common medication categories: • Analgesics – prescribed for pain relief • Antidysrhythmic – prescribed for heart rhythm disorder • Anticonvulsants – prescribed for seizure control • Antihypertensive – prescribed to reduce hypertension • Bronchodilaters – prescribed for relief of bronchial asthma and anaphylaxis affecting the respiratory system • Antidiabetic agents – prescribed to control blood sugar (hyperglycemia) • Antidepressant agents – prescribed to regulate psychological and emotional states	
8. Define the following pharmacology terms: A. Pharmacology B. Drug/Medication C. Administration route D. Generic name E. Trade/Brand name	*Definition of pharmacology terms:* A. Pharmacology - the study of drugs and their effect on the body B. Drug/Medication - a chemical substance used to treat or prevent a disease or condition C. Administration route - method by which the medication is given or taken by the patient D. Generic name - the pharmacological name given to a drug when originally developed E. Trade/Brand name - the drug name used by the manufacturer for marketing purpose	D. The generic name is the name listed in the U.S. Pharmacopeias, a governmental publication listing all drugs in the United States. • Generic names: albuterol sulfate, epinephrine hydrochloride, nitroglycerin E. Trade/Brand names: Proventil[7], Adrenalin[7], Nitrobid[7]

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
9. Give the generic and trade names for the medications listed in the EMT National Standard Curriculum: A. Oxygen B. Oral glucose C. Bronchodilators D. Epinephrine E. Nitroglycerin	*Generic and Trade/Brand names:* A. Oxygen - • *Generic* – Oxygen USP • *Trade* - None B. Oral glucose • *Generic* - Dextrose carbonate solution, glucose paste, glucose gel • *Trade* - Glucola®, Glucopaste®, etc. C. Bronchodilators • *Generic* - Albuterol sulfate, metaproteranol, isoetharine, etc. • *Trade* - Proventil®, Ventolin®, Bronchometer®, Bronkosol®, Alupent®, Metaprel®, etc. D. Epinephrine • *Generic* - Epinephrine hydrochloride • *Trade* – Adrenalin,® Epi-Pen, Twinject, Ana-Kit E. Nitroglycerin • *Generic* - Nitroglycerin • *Trade* - Nitrolingual® spray, Nitrobid®, Nitrostat®, etc.	• The trade names presented are the most common, but other trade names may exist.
10. Discuss the form in which the following medications are available: A. Oxygen B. Glucose C. Nitroglycerin D. Bronchodilators *(Continued)*	*Forms medications are available:* A. Oxygen - gas B. Glucose - paste, gel, solution C. Nitroglycerin - compressed powder (tablets), spray D. Bronchodilators - inhalers containing fine powder or liquid that are aerosolized or vaporized in a nebulizer *(Continued)*	• Each drug is in a specific medication form that best delivers the medication into the blood stream. *(Continued)*

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
E. Epinephrine	E. Epinephrine - liquid for injection	E. Epinephrine is supplied in syringe kits such as an EpiPen, Twinject, Ana-Kit, etc.
F. Aspirin	F. Aspirin - Chewable tablets	F. Aspirin is supplied in 81mg chewable tablets that are more palatable than regular aspirin.
G. Naloxone	G. Naloxone - auto-injection and syringe with atomizer	G. Naloxone –Must be approved by the EMS Medical Director for specific prehospital agency. • EMTs may use an auto-injector but, are NOT allowed to draw up medications and give IM injections, since this route is NOT approved in the California or in the Los Angeles County Scope of Practice.
11. Define the following terms associated with medication administration:	*Definition of terms:*	
A. Classification	A. Classification - general category for a medication which is determined by the drug's action on cells, organs, and body systems	
B. Action	B. Action - the medication's specific effect on cells, organs, and body systems	B. Action of the medication is responsible for the therapeutic effect the medication has.
C. Indication	C. Indication - the specific condition for which the medication is recommended	
D. Contraindication	D. Contraindication - the circumstances when a medication should NOT be administered	D. Allergy to any medication is always considered a contraindication for medication administration.
E. Adverse/Side effect	E. Adverse/Side Effect - undesirable effect of the medication; may be due to the nature of the drug, dose and rate of administration	E. Some side effects are predictable even when NOT desired; e.g. epinephrine increases heart rate.
F. Administration	F. Administration - includes: dose, route, rate of administration, repeat dose and time, and the maximum amount that can be administered	
G. Dose	G. Dose - specific amount of medication administered that will provide a desired effect, but NOT be harmful	
H. Route	H. Route - how the medication is given or taken by the patient • Sublingual (SL) - medication placed under the tongue is dissolved and absorbed across mucus membranes	H. Medications are administered by various routes: • Sublingual - nitroglycerine tablets and spray
(Continued)	*(Continued)*	*(Continued)*

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
	• Oral (PO) - medication is swallowed and absorbed from the stomach or intestinal tract • Inhalation (IH) - medication prepared as a gas or aerosol and inhaled • Intramuscular (IM) - injected into a muscle and rapidly absorbed • Intranasal (IN)	• Oral - dextrose(glucose) preparations; dextrose carbonate solution, glucose paste, glucose gel, glucose tablet • Inhalation - oxygen, metered dose inhaler, nebulize • Intramuscular - epinephrine • Intranasal (IN) - naloxone
I. Onset	I. Onset - time required for the medication to begin its physiologic effect	
J. Duration	J. Duration - the length of time the medication maintains its physiological effect	
K. Precaution	K. Precaution - measures considered beforehand to avoid complications when administering medications	
12. Define the following terms that pertain to medications or intravenous infusions:	*Definition of terms:*	
A. Bronchospasm	A. Bronchospasm - airways constrict; caused by irritants, foreign body, cold air, exercise or unknown factors	
B. Euphoria	B. Euphoria - feeling of well being	
C. Hypoxemia	C. Hypoxemia - decreased O_2 in arterial blood	
D. Hypoxia	D. Hypoxia - deceased O_2 at the cellular level	
E. Intracellular	E. Intracellular - inside the cell	
F. Necrosis	F. Necrosis - death of tissue or bone	
G. Parenteral	G. Parenteral - route of administration by injection or absorption	G. Parenteral routes: intravenous, (IV), subcutaneous (SQ), intramuscular (IM), or transmucosal (TM)
H. Parenteral Nutrition	H. Parenteral Nutrition - essential nutrients given intravenously	
I. Pursed Lips	I. Pursed Lips - puckered lips	I. Pursed Lips - help patients to breathe out slowly and aids in transporting medication across the alveolar membrane
J. Respiratory Insufficiency	J. Respiratory Insufficiency - is the inadequate elimination of CO_2 and oxygenation of the blood	
K. Spacer Device	K. Spacer Device - a hollow tube attached to an inhaler	K. Spacer Device - allows for better inhalation of medication when patient has difficulty breathing

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
L. Therapeutic Range	L. Therapeutic Range - a concentration between minimal effectiveness and a toxic level	• A spacer device holds the medication in the chamber making it easier for the patient to inhale the medication.
M. Volume-Control Set	M. Volume-Control Set - refers to either a volume-control pump or device that regulates the rate of IV infusion	
13. Explain the meaning of the following drug classifications:	*Drug classifications:*	$ Examples of drugs in each classification:
A. Bronchodilator	A. Bronchodilator - relaxes smooth muscles of the respiratory tract and dilates bronchioles	A. Bronchodilator B Albuterol
B. Caloric Agent	B. Caloric Agent - provides essential amino acids and carbohydrates	B. Caloric Agent B Total Parenteral Nutrition
C. Chemical Absorbent	C. Chemical Absorbent - absorbs certain ingested chemicals or substances in the GI tract	C. Chemical Absorbent B Charcoal
D. Cytoxic Agent	D. Cytoxic Agent - destroys or controls rapidly reproducing cells	D. Cytoxic Agent B Chemotherapeutic Agent
E. Electrolyte	E. Electrolyte - a positive or negative charged element in the blood, tissue fluid, and cells	E. Electrolyte B Potassium Chloride (KCL). Sodium, potassium, and chloride are the major electrolytes that are administered through IV fluids.
F. Hyperglycemic Agent	F. Hyperglycemic Agent - elevates blood glucose levels	F. Hyperglycemic Agent B Dextrose Preparations (gel, paste, solution)
G. Hypoglycemic Agent	G. Hypoglycemic Agent - reduces blood glucose levels	G. Hypoglycemic Agent B Insulin
H. Hypotonic	H. Hypotonic Solution - has less osmotic pressure than blood	H. Hypotonic Solution B D_5W. A hypotonic solution leaves the vascular space within 20-40 minutes and may result in fluid overload and cellular edema.
I. Isotonic	I. Isotonic Solution - has approximately the same osmotic pressure as blood	I. Isotonic Solution B Normal Saline, Lactated Ringer's Solution. An isotonic solution is used for fluid replacement and remains in the vascular space less than 1 hour.
J. Narcotic Analgesic	J. Narcotic Analgesic - depresses the central nervous system and is used to relieve pain	J. Narcotic Analgesic B Morphine, Codeine, Fentanyl
K. Vasodilator	K. Vasodilator - dilates blood vessels	K. Vasodilator B Nitroglycerin
L. Nutritional supplement	L. Nutritional Supplement - provides or increases essential vitamins or minerals that may be insufficient	L. Nutritional Supplement B Folic Acid, Multi-vitamin & Thiamine infusions. Some patients may be deficient in water/fat soluble vitamins
(Continued)	*(Continued)*	

		(Continued)
LEARNING OBJECTIVES	**LESSON CONTENT**	**NOTES / RATIONALE**
M. Sympathomimetic Agent	M. Sympathomimetic Agent - produces the same effect as when the sympathetic nervous system is stimulated	due to poor nutrition or their medical condition. M. Sympathomimetic Agent ʙ Epinephrine
14. Give the most pertinent information regarding the medications that BLS Units may carry. A. Oxygen	*Medications that may be carried on a BLS Unit:* A. Oxygen • Oxygen should never be withheld from a patient in respiratory distress • DO NOT use oxygen powered breathing devices in: - pediatric patients < 12 years of age - patient intubated with ET tube - patient intubated with King (LTS-D) - chest injuries - COPD	A. Oxygen: • Normal metabolic function requires oxygen (aerobic metabolism). • In some COPD (CO_2 retaining) patients, oxygen may decrease the respiratory drive. Observe for any changes in respiratory and mental status and be ready to assist ventilations if necessary. • Oxygen that is NOT humidified may dry out or irritate mucus membranes. • Oxygen-powered breathing devices (demand valve) may cause gastric distention or a pneumothorax due to high pressures. • *Oxygen Delivery Adjuncts in Los Angeles County:* - nasal cannula - face mask - bag-valve-mask with O_2 reservoir (non-rebreather mask) - endotracheal tube (ET) - perilaryngeal airway device (King LTS-D)
B. Dextrose Preparations	B. Dextrose Preparations • Administer oral solution only if the patient is able to hold the bottle and drink without assistance. • DO NOT administer if there is a potential for an altered level of consciousness.	B. Dextrose Preparations: • The entire amount of solution does NOT need to be administered if improvement is noted in the patient's condition. • There is a risk of vomiting and aspiration if a decrease in consciousness occurs.
C. Aspirin	C. Aspirin • Administer if suspicion of chest pain due to myocardial origin • Use 81mg tablets and instruct patient to chew and	C. Aspirin

(Continued)	swallow tablets *(Continued)* • Administer if suspicion of chest pain due to myocardial origin • Administer regardless if patient is on anticoagulants or has taken aspirin prior to arrival • Use 81mg tablets, more palatable than regular ASA tablet • Instruct patient to chew tablets and then swallow • If ALS response is not available, transport to nearest emergency room	• Administer regardless if patient is on anticoagulants or has taken aspirin prior to arrival • The 81mg tablets are more palatable to *(Continued)*
LEARNING OBJECTIVES	**LESSON CONTENT**	**NOTES / RATIONALE**

	• Instruct patient to chew tablets and then swallow • If ALS response is not available, transport to nearest emergency room	chew especially for nauseated cardiac patients • May exacerbate asthma • An ALS unit must be enroute OR the patient must be transported immediately to the nearest emergency department if ALS response is delayed or NOT available • Administer if suspicion of chest pain due to myocardial origin • Administer regardless if patient is on anticoagulants or has taken aspirin prior to arrival • Use 81mg tablets, more palatable than regular ASA tablet • Instruct patient to chew tablets and then swallow • If ALS response is not available, transport to nearest emergency room
15. Give administration parameters pertinent for the following emergency medications: A. Bronchodilators (Albuterol) *(Continued)*	The most common emergency medications EMTs may need to assist patients with administration. A. Bronchodilators (Albuterol) • Administer high flow oxygen • The patient's inhaler or nebulizer is for emergency supportive therapy only and is NOT a substitute for *(Continued)*	A. Bronchodilators: • EMT providers are NOT authorized to carry bronchodilators, but may assist a patient with their own physician prescribed inhaler or nebulizer. *(Continued)*
LEARNING OBJECTIVES	**LESSON CONTENT**	**NOTES / RATIONALE**
B. Epinephrine	immediate medical care. • An ALS unit must be enroute OR the patient must be transported immediately to the nearest emergency department if ALS response is delayed or not available. B. Epinephrine	• Patients with hypoxia may experience cardiac dysrhythmias. B. Epinephrine:

(Continued)	• Administer high flow oxygen • The Epinephrine Auto Injector is for emergency supportive therapy **only** and is NOT a substitute for immediate medical care • An ALS unit must be enroute OR the patient must be transported immediately to the nearest emergency department if ALS response is delayed or NOT available • Administer in the lateral aspect of the thigh only and NOT in the buttocks, hands, feet or intravenously • Check the medication for dose, integrity of container, clarity, concentration and expiration • Administer only one dose of 0.3mg of epinephrine *(Continued)*	• EMT providers are NOT authorized to carry Epinephrine Auto-Injectors, but may assist patients with their **own** physician prescribed device • Injection intravenously may result in an acute myocardial infarction or cerebral hemorrhage. • Injection into buttocks, hands or feet may result in loss of blood flow to the affected area and result in delayed absorption and tissue necrosis. • A solution that is discolored, contains particles, or is outdated may be chemically altered and may lose its potency or result in muscle damage. • Adult EpiPen® contains 2mL (2mg) of ***1:1000 epinephrine***. The auto-Injector delivers 0.3mL (0.3mg); approximately 1.7mL remains in the pen after activation. • Pediatric EpiPen Jr®. contains 2mL (1mg) of ***1:2000 epinephrine***. The auto-Injector delivers 0.3mL (0.15mg); approximately 1.7mL remains in the pen after activation. ** *Signs/symptoms of anaphylaxis are: flushed skin, nervousness, syncope, tachycardia, thready or unobtainable pulse, hypotension, convulsions, vomiting, diarrhea, abdominal cramps, urinary incontinence, wheezing, stridor, difficulty breathing, itching, rash, hives, and generalized edema* ** *Signs/symptoms of severe asthma are: cyanosis, retractions, frantically trying to breathe, inspiratory and expiratory wheezing, accessory muscle use exhaustion, altered LOC.* *(Continued)*

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE

C. Nitroglycerin	C. Nitroglycerin • Administer high flow oxygen • Nitroglycerin administration is for emergency supportive therapy only and is NOT a substitute for immediate medical care • An ALS unit must be enroute OR the patient must be transported immediately to the nearest emergency department if ALS response is delayed or NOT available • Take blood pressure before and 5 minutes after administration • DO NOT shake container • Instruct patient NOT to inhale spray	C. Nitroglycerin • EMTs are NOT authorized to carry nitroglycerin tablets or spray, but may assist patients with their own physician prescribed medication. • Nitroglycerin may cause hypotension due to vasodilation. • One spray delivers 0.4mg of nitroglycerin; if the container is shaken it will alter the dose delivered. • Inhaling the spray affects the absorption rate.
D. Aspirin	D. Aspirin E. Naloxone • Administer high flow oxygen if respirations and tidal volume are depressed • The naloxone Auto Injector is for emergency supportive therapy **only** and NOT a substitute for immediate medical care	D. Aspirin • May exacerbate asthma • Effective treatment for heart attacks, ischemic strokes, certain vascular conditions, and rheumatologic diseases. • Long-term, low dose aspirin is used to reduce risk of recurrent heart attacks, sudden death, ischemic strokes, and poor circulation of the legs. • Short-term used for immediate anti-clotting effects are needed to limit damage to the myocardium or brain. • Anticoagulants and ETOH abuse potentiates the risk of bleeding. • EMT units, in LA County, are required to carry aspirin 81mg tablets as of 2014.
E. Naloxone	B. Epinephrine • Administer high flow oxygen • immediate medical care. • An ALS unit must be enroute OR the patient must be transported immediately to the nearest emergency department if ALS response is delayed or not available.	Naloxone

	E. Naloxone • • An ALS unit must be enroute <u>OR</u> the patient must be transported immediately to the nearest emergency department if ALS response is delayed or NOT available • Administer in the lateral aspect of the thigh only and NOT in the buttocks, hands, feet or intravenously • Check the medication for dose, integrity of container, clarity, concentration and expiration • Administer <u>only</u> one dose of 0.3mg of epinephrine	
16. List the intravenous (IV) solutions that a patient may have infusing during an EMT transport.	*Intravenous solutions that an EMT may transport:* • <u>Glucose Solutions</u> (D_5W) • <u>Isotonic Salt Solutions</u> - Sodium Chloride - Lactated Ringer's Solution	• EMTs may transport various combinations of glucose solutions (D_5 2NS, D_5 3NS). • EMTs may NOT transport patients with any other IV solutions that are NOT glucose or isotonic salt solutions (e. g. 0.45NS). • Intravenous infusions may result in systemic fluid overload if NOT regulated. • <u>Signs of fluid overload</u> may include: distended neck veins (JVD),tachypnea, dyspnea, shallow tidal volume, fine auscultatory crackles, and peripheral edema. Intravenous infusions may infiltrate. • <u>Signs of infiltration</u> are swelling and pain around the IV site.

17. Discuss the restrictions when transporting patients with IV solutions containing medication additives.	*Restrictions when transporting patients with IV solutions containing medication additives*: • Must be set at a TKO rate for transport • IV solution additives may NOT exceed maximum concentration.	• Infusion must be adjusted to a TKO rate by hospital personnel/home health personnel. • EMTs are NOT allowed to adjust IV solutions with medication additives except to maintain the preset rate and discontinue the drip if there are signs of infiltration.

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
18. Give the maximum concentration for the following intravenous additives: A. Folic Acid B. Multi-vitamins C. Magnesium Sulfate D. Thiamine	*Maximum concentration for the following IV additives:* A. <u>Folic Acid</u> • Maximum concentration - 1mg/1000mL B. <u>Multi-vitamins</u> • Maximum concentration - 1 vial/1000mL C. <u>Magnesium Sulfate</u> • Maximum concentration - maximum 2 Grams/1000mL ****May only be transported in conjunction with multi-vitamins in same IV solution** D. <u>Thiamine</u> • Maximum concentration - 100mg/1000mL	• These additives are nutritional supplements used to correct vitamin and mineral deficiencies and NOT used to treat signs/ symptoms of malnutrition or withdrawal from alcohol or sedative-hypnotics. • Several of these additives may be mixed in one IV bag; check bag for additives and appropriate concentrations for each additive. B. <u>Multi-vitamins</u> • Multi-vitamins for infusion contain both water and fat soluble vitamins. When added to an IV infusion it gives a yellow color to the solution. C. <u>Magnesium Sulfate</u> • Magnesium Sulfate in a low dose may cause flushing and sweating, but in larger dose will lower blood pressure and may cause respiratory paralysis
19. Explain what common external infusion pumps that EMTs may encounter when transporting patients.	*Common infusion pumps:* • Infusion pumps are medical devices that deliver fluids, medications and nutrients in controlled amounts. • Common external infusion pumps: - large volume – administers Parenteral Nutrition - automated or patient operated medication – administers various medications - patient controlled analgesia (PCA) – administers pain medications - pressurized infusion bulb – administers various medications used in home health care. ** **<u>Pediatric Administration:</u> Infusions must be on a *volume-control set* and adjusted to a TKO rate by hospital/home health personnel.**	• Infusion pumps may be either implanted or external. • PCA pumps must be on a locked setting and may only be activated by the patient or caregiver. • There are different PCA pumps. Transferring personnel must provide EMTs with emergency shut off instructions regarding the specific pump used. • In addition to the most common types, the following may also be seen when transporting patients: - <u>syringe driver or pump</u> – infuse small amounts of fluids or continuously administer medications - <u>enteral</u> – continuous feeding pump - <u>insulin</u> – continuous subcutaneous insulin infusion therapy

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
20. Give the pertinent information regarding the following medication additives that require an infusion pump during transport.	*Intravenous infusions that require an infusion pump:*	• Infusion rates must be preset by hospital/ home health personnel prior to transport. • These medications are extremely dangerous if NOT administered at specific rates. EMTs are required to maintain, but are NOT allowed to adjust the infusion rates.
A. Potassium Chloride Infusion (KCl)	A. Potassium Chloride Infusion (KCl) • Maximum concentration 20mEq/1000mL • Must be on infusion pump • Adult administration – infusion rate must be adjusted by hospital personnel • Pediatric administration – infusion must be adjusted to a TKO rate by hospital personnel	A. Potassium Chloride (KCl) Infusion: • IV concentration higher than 20mEq/1000mL of IV solution must be transported by an ALS Unit and the patient placed on a cardiac monitor. • To transport a patient with Potassium Chloride, an infusion pump is required. EMTs may use their own, if provided by their agency, or use a pump provided by the transferring facility. If there is no pump available the patient cannot be transferred by a BLS unit. • Potassium Chloride may cause cardiac dysrhythmias that can lead to cardiac arrest. • IV infiltration can cause tissue necrosis
B. Total Parenteral Infusion (TPN)	B. Total Parenteral Infusion (TPN) • Must transport this solution with an infusion pump and rate preset by hospital/home health personnel • All connectors must be tight and patient must be moved carefully from bed and gurney	B. Total Parenteral Infusion (TPN) • Interruption of the TPN infusion may result in hypoglycemia. • A break in the system may result in an air embolism which may be fatal.
21. Define medication patches.	*Definition of medication patches:* • Medication patches are thin patches with an adhesive backing placed on the skin to deliver medication by absorption through the skin into the blood stream	• Medication patches are also called transdermal patches. • The US Food and Drug Administration (FDA) classifies medication patches as a medical device and a drug.

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
22. Discuss what types of medications that may be delivered by medication patches.	*Types of medications that may delivered by medication patches:* • Nitroglycerin • Hormones • Antidepressants • Attention deficit disorders (ADHD) • Alzheimer's disease • Motion sickness • Pain control • Smoking cessation	
23. Explain what precautions need to be taken when dealing with a patient that has a medication patch.	*Precautions that must be taken with medication patches:* • Wear gloves to avoid touching the adhesive surface imbedded with medication • DO NOT discard medication patch in regular trash, but dispose in sharps container	• When touching the medication, it could possibly be absorbed by the healthcare provider. • Patches are considered hazardous waste and absorption by others could cause severe side effects i.e. Nitro patch could result in headache and hypotension.
24. Discuss what measures the EMS provider must take when transporting a patient who has recently received chemotherapy.	*Measures EMS providers must take when transporting a patient who has recently had chemotherapy:* • Avoid direct contact with the chemotherapeutic agent. • Avoid indirect contact with clothing or linens that are soiled by body fluids • Continue to use PPE for 48 hours after completion of last chemotherapy. ******Pregnant or nursing mothers should defer patient care to partner.***	• Exposure to chemotherapeutic agents places the primary care provider at risk for developing cancer, genetic damage, and may cause birth defects. • Direct contact with some chemotherapeutic agents may cause irritation, burning and tissue destruction. • Chemotherapeutic agents may still be toxic and excreted in all body fluids e.g., urine, vomit, blood, sputum, and feces. • Appropriate personal protective equipment (PPE) consists of Chemosafety gowns and gloves. • Place contaminated clothing and linens in biohazard bag, seal and dispose of per department protocol.

LEARNING OBJECTIVES	LESSON CONTENT	NOTES / RATIONALE
25. Explain what first aid measures are required when exposed to a chemo-therapeutic agent.	*First aid measures when exposed to a chemotherapeutic agent:* • Skin - wash immediately with soap and water. • Eyes - flush with normal saline solution for a minimum of 5 minutes. ******All exposures must be reported and evaluated by a physician******	• Potential for IV leakage and spills can occur. • All units should have a spill kit readily available.
26. Discuss the key steps required when assisting or administering medications.	*Key steps in assisting or administering medications:* • Verify the patient's prescription (prescribed for the patient) • Check administration order; form, dose, and route • Check name of medication • Check dose of medication • Check integrity of container • Check the condition of the medication; clarity of solution, impurities, or intact tablet • Check the expiration date	• Administering medications that are outdated, different dosages than what is prescribed, impure, or prescribed for someone else can result in ineffective action or potentially harmful side effects.
27. Describe what reassessment is required after a medication is administered.	*Reassessment after medication administration:* • Repeat initial assessment • Repeat vital signs • Assess response to medication • Assess for adverse/side effects	• Document reassessment and any improvement or deterioration in the patient's condition.
28. Discuss the importance of documentation.	*Importance of documentation:* • Patient record - documents medication administered - prevents overdose of medication - allows for appropriate repeat intervals • Legal record - documents standard of care • Operational record - determines QI management - provides data collection - allows for better allocation of resources	

Section 6:
Trauma

Learn the Facts

You should have a comprehensive understanding of:

- Anatomy & Physiology
- Conditions listed in the index
- Glossary words
- Medical terms listed in each chapter
- Pathophysiology

Understand the Concepts

You should have an extensive understanding of the following:

1. Complications of spinal cord injuries
2. Ecchymosis
3. Indications for spinal immobilization
4. Indications for tourniquet use
5. Pathophysiology of Cushing's reflex
6. Signs and symptoms of chest wall injuries (such as sucking chest wounds and tension pneumothorax)
7. Signs and symptoms of commotio cordis
8. Signs and symptoms of referred pain (such as Kehr's sign)
9. Subcutaneous emphysema
10. Techniques for opening the airway

Perform the Skills

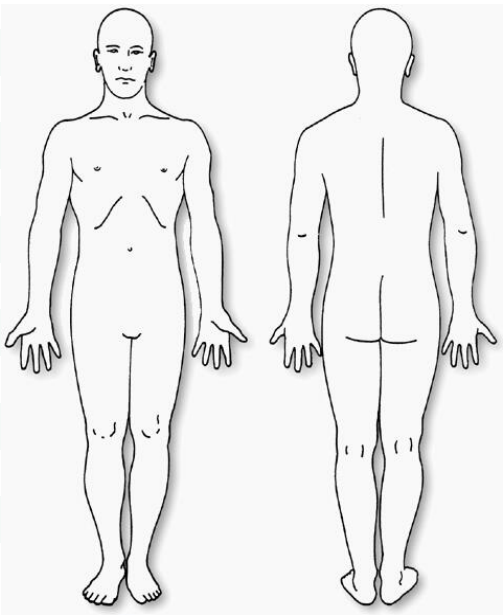
Finally, you should be able to:

1. Calculate a Glasgow Coma Score
2. Calculate percent of body surface area burned
3. Differentiate between a tension pneumothorax and pericardial tamponade
4. Differentiate between traumatic brain injury (TBI) patterns
5. Differentiate between types of shock
6. Evaluate withholding resuscitation efforts
7. Treat a patient with a scalp injury
8. Treat a patient with a soft tissue injury (such as avulsions and impaled objects)
9. Treat a patient with a thermal injury
10. Treat a patient with an abdominal evisceration
11. Treat a patient with an amputated extremity

Trauma Patient Assessment

Proctor:	Student Name:	Start Time:	End Time:
Attempt #	**Scenario #**	**Date:**	

BSI:		***Secondary***	S A M P L E if possible	***Vitals***	**Baseline**	**Reassessment**
P:			***Must identify a minimum of 40****	**B:**		
E:		**Head** Bones	Occipital / Parietal / Frontal / Temporal	**E:**		
N:			Orbits / Zygomatic / Maxilla / Mandible	**L:**		
M:		Eyes	Racoon Eyes / Pupils	**L:**		
A:		Nose	Singed hair / Soot / Blood / CSF	**S:**		
N:		Ears	Blood / CSF / Battle's Signs	**R:**		
Primary		Mouth	Oral trauma / Obstructions	**P:**		
G.I.:		**Neck**	JVD / Tracheal Deviation / Spinal Step Offs	**Treatment & Interventions:**		
L.T.:			Subcq Emphysema / Stoma / Trach / Med Tags			
AVPU / LOC:			***Cervical Collar Applied***			
C/C:						
A:		**Chest**	Shoulders / Clavicle / Sternum / Intercostals			
B:			Sucking Chest Wound / Flail Chest / Paradoxical			
O2 Admin:			Carotid Pulse / Accessory Muscle / Med. Devices			
C:	COPS	**Abdominal**	DRGEM / Pregnancy			
D/D:		**Pelvis**	Pelvis / Incontinence			
E:			Blood / Priapism			
F:		**Lower**	Femur - Offset Pressure / Femoral Pulse			
G:	ALS / BLS		Patella - Palpate			
	CODE 2/3		Tib/Fib - Offset Pressure / CMS / Tats & Tracks			
	Specialty / MAR	**Upper**	Humerus - Offset Pressure / Tats & Tracks			
DCAPBTLS			Ulna/Radius - Offset Pressure / CMS			
TIC		**Back**	Step Offs / Lung Sounds / Incontinence / Sacral Edema	**____ / 56 injuries**	**GCS:**	



Final Evaluation (Required):

Proctor Signature: **Long Spine Board Complete? Y / N**

Mark "X" only if the student did not properly complete the step. Any "X" must be clearly explained in the evaluation

GLASGOW COMA SCALE

A patient would assume a comatose state due to trauma, metabolic, toxicological reasons such as inadequate oxygen and glucose to the brain or excessive carbon dioxide due to inadequate breathing, ingestion of poisons or drugs, etc. Evaluation of the depth of a coma can aid in the diagnosis and suggest treatments and prognosis. The most widely accepted method of evaluating a coma is the Glasgow Coma Scale. Originally published in 1974 by Teasedale and Jennett they suggested a scale for the assessment of coma and impaired consciousness. Originally promoted for use in hospitals by doctors, it has made its way to the prehospital setting and its use is taught to both paramedics and EMTs.

Essentially the GCS has the clinician give a stimulus to the patient and look for (and record) the patient's response. The stimulations range is from no stimulus applied to the application of painful stimuli. The less stimulation needed to illicit a response the less the "depth of coma" is and presumably the better the patient outcome will be. The correlation of numbers to behaviors can be used to document and track a patient's progress or lack of progress and direct patient treatment.

GLASGOW COMA SCALE	
Eye Opening	
Spontaneous	4
To Voice	3
To Pain	2
None	1
Verbal Response	
Oriented	5
Confused	4
Inappropriate Words	3
Incomprehensible Words	2
None	1
Motor Response	
Obeys Command	6
Localizes Pain	5
Withdraws (pain)	4
Flexion (pain)	3
Extension (pain)	2
None	1

Bleeding Control

Blood loss is often associated with soft tissue injury and may be either subtle or dramatic. Damage to arteries, veins or capillaries or a combination of vessels can result in life-threatening hemorrhage. Arterial bleeding is usually described as bright red and spurting; venous bleeding is dark reddish-blue and steadily flowing; capillary bleeding is bright red and oozing and may subside spontaneously. Regardless of where the bleeding is coming from it should be controlled. Control of bleeding takes priority over initiating IV access. No matter how minor the bleeding may appear, loss of red blood cells may result in loss of oxygen carrying potential, shock and ultimately lead to death.

Recently the EMS Agency has received questions regarding the appropriate treatment of bleeding in prehospital care. Traditionally control has been performed by the following sequential steps.

- Apply direct pressure over the wound using a sterile dressing
- Apply a pressure dressing (adding additional dressings if needed)
- Immobilize the bleeding extremity
- Apply a tourniquet as indicated – immediately if arterial bleed, and when unable to control bleeding with direct pressure

Direct pressure remains the recommended initial step in bleeding control. Most bleeding is controlled in 4-6 minutes. Direct pressure may involve use of finger tips or may require hand pressure. Providing pressure to the area and directly compressing the vessels decreases the blood flow and allows for the formation of a clot. Pressure must still be held after a dressing has been applied. If the dressing becomes saturated, it must not be removed as this may cause dislodgement of a clot that has started to form and lead to further bleeding. Additional dressings should be applied over the original dressing as needed.

If direct pressure is not successful in controlling the bleeding a pressure dressing should be applied (using elastic wraps) over the original dressings.

If direct pressure has not controlled the bleeding, However, no research has been published to support the effectiveness of elevation or the use of pressure points in slowing the blood flow. Therefore, some advocates believe that elevation and providing manual pressure directly over pulse pressure points are not practical steps and tourniquets should be applied early if direct pressure and use of a pressure dressing have not been effective.

The use of tourniquets may be used if all the above measures have failed. Caution must be used in the application of tourniquets since their use may cause damage to nerves, muscle, blood vessels and soft tissue resulting in the potential for loss of the extremity. However, this does not preclude the use of a tourniquet earlier if arterial bleed, bleeding is perfuse, or the extremity is so severely injured that it is determined a tourniquet is needed. Application of tourniquets is safe when applied properly. A wide bandage must be used and secured tightly to prevent cutting into the skin and underlying tissue. Once a tourniquet is applied, it should not be loosened or removed in the field without approval of a physician. The goal is to save a life, even at the expense of potentially losing a limb.

Developed 201 (JC)1, Revised 2015 (etr)

MEDICAL CONTROL GUIDELINE: TRAUMATIC HEMORRHAGE CONTROL

PRINCIPLES:

1. Tourniquets have been demonstrated to be safe and effective when used appropriately and can be lifesaving.

2. A hemorrhage control tourniquet should be used if external bleeding from an extremity cannot be controlled by direct pressure.

3. Poorly perfusing patients with an isolated penetrating extremity injury and those with amputations or mangled extremities should have a tourniquet applied even if minimal to no visible bleeding.

4. Tourniquet application may be the initial method to control extremity bleeding when scene safety concerns or resource limitations preclude direct pressure application.

5. Tourniquet application frequently results in severe pain. Consider pain management as necessary. Refer to Reference No. 1275, General Trauma.

6. Hemostatic Agents are only to be utilized by approved providers.

GUIDELINES:

1. Explain usage of tourniquet to patient.

2. Follow manufacturer's instructions for application of the tourniquet.

3. Apply tourniquet 2-3 inches proximal to the bleeding site but not over a joint or the hemorrhaging injury.

4. Ensure that bleeding is stopped and distal pulses are absent after the application of the tourniquet.

5. Once a tourniquet is applied, the patient should be reassessed at least every 5 minutes for continued absence of distal pulse and/or bleeding.

6. If bleeding is not controlled with one tourniquet, a second tourniquet may be applied proximal to the first tourniquet. Do not remove the first tourniquet after applying the second tourniquet.

7. Once a tourniquet is applied it should not be loosened or removed without physician approval.

8. Paramedics shall make base hospital contact and transport in accordance with Reference No. 808, Base Hospital Contact and Transport, and Reference No. 502, Patient Destination.

9. Paramedic shall document the time tourniquet applied on the tourniquet and on the EMS Report Form. Remaining patient documentation will be in accordance with Reference No. 606, Documentation of Prehospital Care.

PREHOSPITAL TREATMENT OF THERMAL BURNS

A thermal burn is a traumatic injury that affects the largest organ of the body — the skin. This makes it the worst 'single mechanism' trauma that can affect the body. Burn victims rarely die immediately from their burn injuries (immediate death from a burn situation generally comes in the form of an inhalation injury).

Burn patients generally succumb much later from complications arising from an inability of the skin to perform its biological tasks (i.e. temperature regulation, fluid containment, and infection barrier) Death comes from conditions as diverse as sepsis and may lead to suicide due to altered body image. The time from injury to death can be years in some cases.

The best method for treating a burn injury is to perform an intervention that will preserve as much of the remaining skin tissues as possible. There are direct benefits in reducing the depth of a burn injury and preserving as much of the unburned healthy tissue as possible. Burn treatment is related to the depth and area of a burn injury.

Treatments are traditionally classified based on determining whether the burn is a first, second or third degree (superficial, partial or full thickness). Unfortunately burn injuries always transition near their periphery and except in cases of incineration, a third degree full thickness injury will be surrounded by a second degree partial thickness and a first degree superficial burn at the demarcation line between healthy tissue and the burn injury. This can complicate care as treatments are slightly different depending upon the injury.

In all cases of a thermal burn the burning process MUST be stopped. Flames must be extinguished and the burning process within the tissues halted. This is best accomplished with cool water. In cases of either minor or major body surface area (BSA) involvement, cooling should be started immediately but submersion and the use of soaking wet dressings for transport should be avoided. Never use ice or ice cold water for cooling.

Pain is a significant problem in superficial and partial thickness burns. There is no reliable method of determining exactly when the underlying burning process has been stopped. Traditionally a decrease in pain has been the most significant indicator of a reduction in the burning process. Even though there is no direct evidence that cool moist dressings actually reduce pain, the cooling sensation is sometimes a psychological benefit to the patient. EMTs do not have analgesia available to them. In the past continued application of cool water/wet dressings was the method used to control pain however; this may macerate tissue and should not be used. Covering the nerve endings decreasing air flow over the burn helps to decrease the pain. Patients should be transported to the nearest receiving hospital or trauma center utilizing dry dressings...

The greater the depth of the burn, the greater the potential for complications; the complications of over-zealous application of water in burn situations may result in:

1. Hypothermia - damaged skin cannot regulate temperature effectively. When coupled with the very effective method of evaporation (and conduction) that happens when cool water is applied, a burn patient is more susceptible to hypothermia. This is further complicated of the addition of significant amounts of

intravenous infusions that are given as part of intra-hospital therapy. The infused fluids are generally not warmed, thus further complicating the problem of hypothermia.

2. Maceration of tissue cells - when cells are exposed to or submerged in water for extended periods of time there is a reduction in the tensile strength and the cells soften which can increase the tendency toward destruction and tearing. Therefore, the continuous application of water to a burn injury can increase the injury and complicate the healing process and should be avoided.

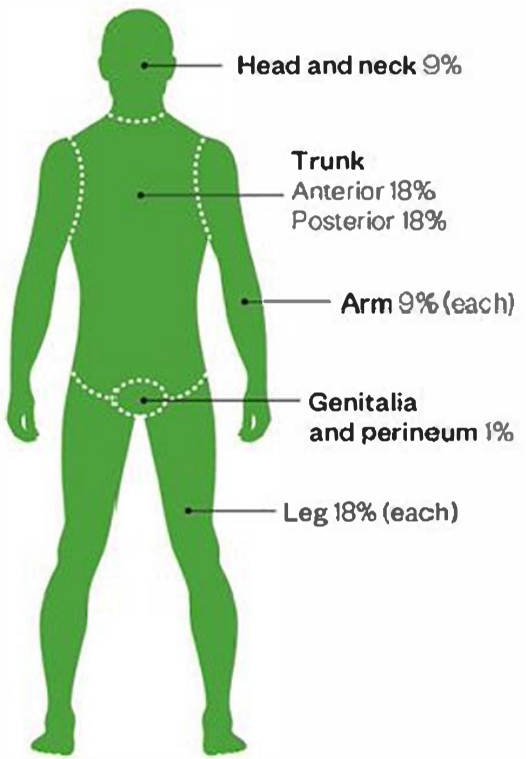
Initial cooling of a burn injury is recommended then transporting the patient with dry dressings should be done as soon as possible. Sterile dressings are appropriate to minimize the possibility of infection however if field conditions are not conducive to the maintenance of sterility, a clean field should be maintained.

Transportation of patients with severe burns to the nearest facility or trauma center is of the utmost importance for stabilization. In Los Angeles county, burn beds are limited thus beds may not be available. These centers may not be equipped to handle the other emergency situations that may accompany a burn patient's injuries. Therefore, patients should not be transported to a burn center initially unless directed by the base hospital or the Medical Alert Center.

Developed 2011 (JC), Revised 2015 (etr)

PANEL 1

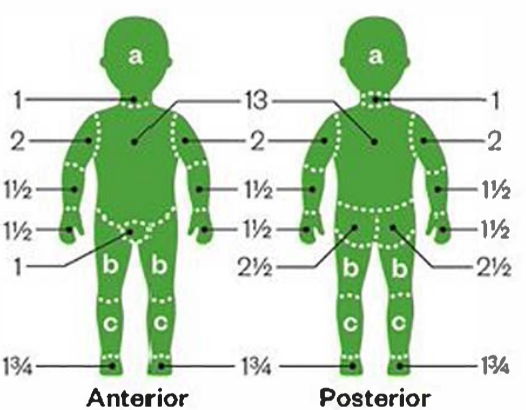
Wallace rule of nines



Lund and Browder chart

Relative percentage of body surface area (% BSA) affected by growth

	half of head (a)	half of one thigh (b)	half of one lower leg (c)
0 yr	9½	2¾	2½
1 yr	8½	3¼	2½
5 yr	6½	4	2¾
10 yr	5½	4¼	3
15 yr	4½	4¼	3¼



EYE INJURIES
PATCHING ONE EYE vs BOTH EYES

Eye injuries that are treatable in the field come in two varieties. Chemical burns and trauma (blunt & penetrating). In chemical burn situations the treatment is to thoroughly flush out the eye with water. This flushing process is generally done to both eyes and can take some time, so it is continued enroute and patching one or both eyes is not an issue. However, when it comes to trauma, the decision to patch one eye or both exists.

A traumatic force to the eye may result in a potential for many different types of injuries that range from corneal abrasions, detached retinas, damage to the globe. Sometimes trauma can produce obvious injuries such as impalement, extrusion or enucleation, but in most cases only a detailed exam in a hospital, using specialized equipment, can evaluate the extent of the injury.

Use of an eye patch has been the treatment of choice for years. A patch covers any open wound and prevents further contamination or infection and if properly applied, it can prevent the expulsion of ocular humors through a global laceration by avoiding external pressure. *But should just the affected eye be patched or should both eyes be covered?*

A decrease in movement of the affected eye is seen as being beneficial. It has been argued that by covering both eyes you would prevent the spontaneous movement that occurs in the affected eye because of the mechanism that links both eyes for stereoscopic vision. While decreasing the movement of the injured eye can be beneficial, studies have shown that patching both eyes does not reduce spontaneous eye movement, but may increase the anxiety and fear of the patient.

Patching both eyes in the field causes "immediate blindness". Anyone who suffers an eye injury immediately wonders and fears that it is going to cause blindness. The act of intentionally causing blindness as a routine part of the treatment reinforces the patient's greatest fear and can cause panic. Panicked patients cannot answer questions effectively and are slow or incapable at following instructions. This makes patient management much harder. Safe ambulation is impaired and any other treatment or procedure must be explained more completely before instituting them (IV attempts, or even oxygen administration) may take more time. Therefore, it is recommended that unless there is an injury that affects both eyes that requires patching, the prehospital provider should patch only the affected eye.

Developed 2011(JC), Revised 2015 (etr)

TRANSPORTATION OF AMPUTATED BODY PARTS

Progress in surgical technique has made the potential for reattaching a severed part (re-implantation or replantation) a viable reality today. Some parts, like a severed ear, are relatively easy to attach as their revascularization and vitalization is the only concern. Replanting an arm or leg is much more difficult. Not only is re-perfusing the limb a concern, but making the various ligaments, tendons and nerves functional is necessary if the reattached part is ever going to be more than prosthesis for improving body image. Even if the amputated part cannot be reattached, the skin may be used to cover the limb end.

In the prehospital setting, a paramedic or EMT should NEVER comment on whether a severed part can be replanted. It is impossible to determine the treatment possibilities in the field. This type of statement may turn out to be false and could set the patient up for having a poor relationship with the doctor or even result in a lawsuit for negligence if re-implantation is not attempted or is unsuccessful.

If there is any possibility that the amputated part can be reattached it must be properly cared for during transport. There has been conflicting information about how to transport and preserve amputated parts. Essentially measures should be taken to slow metabolism and decrease tissue death. Cold is a method of slowing metabolism and has been shown to protect non-perfusing tissues. However, cold can damage as well as preserve and it is impossible to provide the exact amount of cooling without doing damage in the prehospital setting. Protecting a part by soaking it in water (or balanced salt solution) can lead to maceration or edema, both affecting tissue survival.

Current recommendations for managing amputated body parts include "dry cooling and rapid transport". The amputated part should be placed in a dry bag, sealed and the bag placed in cool water. Ice cubes in the water is controversial, but may be valuable depending on the environmental temperature. AVOID DIRECT CONTACT BETWEEN ICE AND THE AMPUTATED PART.

USE OF CONSTRICTING BANDS IN THE TREATMENT OF SNAKEBITE

Bites by non-venomous snakes produce no more complications than would be caused by any other traumatic skin break. The bite of a poisonous snake involves the injection of a venom into the victim. Venom contains toxins and enzymes that paralyze the snake's prey and begin a digestive tissue destructive process. Many different methods for the treatment of snakebite have been proposed over the years. Most were aimed at attempting to remove the venom (cutting the bite and sucking out the fluids) or preventing its spread. (applying ice and/or constricting bands).

The medical literature is lacking on prospective randomized studies that document the best methods of dealing with snakebite. Most of the articles are published accounts of case studies and local guidelines or protocols. The main medical consensus seems to be that the use of anti-venom is the best method of dealing with the consequences of envenomation.

The following suggested treatments are either worthless or add too many of their own complications to be worthwhile:

1. Ice - applying ice to the skin causes frostbite. Its application to a snake bite injury has not been demonstrated to reduce the spread of injected venom and may cause further complications.
2. Cutting and sucking - again common sense might suggest that this is the best method of eliminating venom from a victim's body, however, scientific data has not demonstrated that this is effective and can increase infection. The complication of creating an additional injury and route for infection is not worth the risks.
3. Constricting Band - it was also believed that if the problem in envenomation was the spread of the venom and containing it through the use of a constricting band must be beneficial. This is Not true. A study by Amaral CF et al in 1998 demonstrated that the use of a "tourniquet" is "ineffective" in the treatment of snake bite injuries and anti-venom was the best treatment.

Many physicians in Los Angeles County, who are experts in this field, feel strongly that the best measure to take in prehospital care is to prevent the distribution of venom by immobilizing the extremity (splint or sling) and transporting to a hospital where anti-venom can be administered. They do not recommend constricting bands, but to keep the patient calm, the extremity at or below heart level, and immobilized.

Another LA County protocol is to NOT bring the snake to the hospital. There seems to be little benefit in doing this. First it exposes the rescuers and hospital personnel to harm by attempting to catch the snake. Even if the snake is dead it is still hazardous. ("Dead Rattle Snakes Can Bite" Mayo Clinic Health Letter 1999) Second it is generally well known by the health care workers what type of snakes are endemic in the geographical area and the exact type can be narrowed down (if necessary) by the description from the patient. If the snake was a pet, then the exact species should be readily identified by the owner.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

PATIENT ASSESSMENT & MANAGEMENT - TRAUMA

PERFORMANCE OBJECTIVES

Demonstrate competency in performing a complete trauma assessment involving scene size-up, primary assessment, secondary assessment, physical examination, ongoing assessment, and perform life-threatening interventions as necessary.

CONDITION

Perform a trauma assessment on a simulated patient and perform life-threatening interventions as necessary. Necessary equipment will be adjacent to the patient or brought to the field setting.

EQUIPMENT

Live model or manikin, oxygen tank with flow meter, oxygen tubing, BMV device, oxygen mask, nasal cannula, stethoscope, blood pressure cuff, pen light, timing device, clipboard, pen, goggles, various masks, gown, gloves, trauma bag, airway bag, SMR equipment.

PERFORMANCE CRITERIA

- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.
- Patient assessment and management of life-threatening interventions must be completed within 10 minutes.

PREPARATION	
Skill Component	**Key Concepts**
♦ Take body substance isolation precautions	• Mandatory (minimal) personal protective equipment – gloves

SCENE SIZE-UP Critical Decisions	
Skill Component	**Key Concepts**
♦ Assess the scene: • Personnel/patient safety • Environmental hazards • Number of patients • Mechanism of injury/Nature of illness	• The initial information obtained from the mechanism of injury or nature of injury assists in formulating the field impression.
♦ Determine need for: • Additional resources • Specialized equipment • Extrication/spinal motion restriction (SMR) - Approach the patient from the front side – if possible - Direct patient not to move or turn head - Direct 2nd rescuer to stabilize the cervical spine	• Trauma patients have the potential for a spinal injury. Determine the level of SMR required. • Approaching the patient from the front, whenever possible, minimizes the potential that the patient will turn his/her head to look at the EMS provider. • Initiating axial spinal stabilization begins with manual control of the head. The C-collar is applied after the primary assessment is has been completed.
♦ Evaluate need for additional BSI precautions	• Situational - goggles, mask, gown

PRIMARY ASSESSMENT (Initial Assessment)	
Skill Component	**Key Concepts**
♦ Formulate a general impression of the patient: • General impression - Stable • Imminent Life-threatening condition - Potentially unstable • Observe for major disabilities - Unstable NOTE: The patient's condition may change at any time. EMS providers must reassess and manage any changes in the patient's condition.	• The general impression is determined by observing the appearance and hygiene, patient position, sounds, and smells. It establishes the overall condition of the patient, and if immediate life threats exist, or if are immediate interventions are needed. Does the patient appear stable, potentially unstable, or unstable? • The primary assessment should be completed within 60 – 90 seconds. • Stop, and manage life-threatening situations when identified.

Skill Component	Key Concepts
♦ Establish patient rapport – *if patient is alert* • Introduce yourself to the patient and/or caregiver • Ask the patient's name • Ask why EMS was called (preliminary chief complaint of the patient) • Obtain permission to treat • Respond with empathy • Use positive body language	• The overall situation and patient condition will determines the level of rapport that is possible. • Establishing a positive rapport assists with decreasing the patient's anxiety and promotes a greater degree of cooperation. • Determining the reason that EMS was called assists with determining the preliminary chief complaint and ultimately the provider impression. • Patients with decision making capabilities have the right to refuse treatment and transport. See LA County Reference No. 834, Patient Refusal of Treatment and Transport. • Responding with empathy develops trust and encourages effective patient communication. • Patients have the right to be treated with respect. Care and treatment should be delivered in a non-judgmental and impartial manner. • Positive body language refers to facial expressions, gestures, and body movements that are used to communicate a variety of messages to the patient by the healthcare provider; (i.e. caring words, providing encouragement, and performing interventions competently).
♦ Assess mental status/stimulus response (AVPU): • Alert • Verbal stimulus • Painful stimulus • Unresponsive	• During the primary assessment, only the patient's response to environmental stimuli is determined. This is NOT the time to obtain a comprehensive orientation level. • The least amount of stimuli should be used to determine mental status.

IF UNRESPONSIVE AND NOT BREATHING GO TO CPR AND AED SKILL(S)

Skill Component	Key Concepts
♦ Assess the **airway**: • Patent • Obstructed	• Noisy breathing is obstructed breathing. • If the airway appears obstructed, go to Adult Obstructed Airway skill. • Open the airway and assess for the presence of a foreign body such as food, gum, etc., if indicated. If it can be removed easily, remove it.
♦ Manage the **airway** – if indicated ** ***Manage life-threatening findings:*** • ***Open and clear/suction airway - if indicated*** • ***Utilize basic airway adjuncts - if indicated*** • ***Initiate immediate transport – if unable to open the airway***	• Insert nasopharyngeal (NP) airway for either responsive or unresponsive patients. NP airways are contraindicated in pediatric patients less than 12 months of age. • Use Insert an oropharyngeal (OP) airway for the unresponsive patient with no gag reflex. • Immediate transport should be initiated if unable to establish or maintain an adequate airway.
♦ Determine if the airway is manageable vs, unmanageable	• A patient has a manageable airway if: - breathing adequately through a patent airway - ventilation is effective using positive pressure ventilation using a bag-mask-ventilation (BMV) device. • A patient has an unmanageable airway if: - the patient cannot breathe on his/her own - the patient cannot be ventilated with a BMV

Skill Component	Key Concepts
♦ Assess **breathing**: • Rate (fast, slow, normal or absent) • Rhythm (regular, irregular) • Quality (air movement, chest expansion) • Depth (tidal volume) • Rapid chest auscultation - *if difficulty breathing, shortness of breath, and chest trauma*	• Visualize chest and signs of inadequate breathing. • The initial respiratory rate should not be counted at this time, but only observed if it is too fast, too slow or in the normal range. • Abnormal rates may not provide adequate ventilations or tidal volume. Use BMV to increase tidal volume or rate if necessary, especially if level of consciousness is decreased. • Administer O2 therapy if vital organs are at risk for hypo-perfusion. • When rapid chest auscultation is indicated, auscultate for the presence and equality in *2 locations only* (5^{th}-6^{th} intercostal space, mid-axillary line) bilaterally.
♦ Manage **breathing** – if indicated ** Applies oxygen – if indicated ***** For non-critical patients, titrate oxygen to maintain a SpO_2 reading between 94-98%*** ***** For patients with COPD, titrate oxygen to maintain a SpO_2 reading between 88-92%*** ***** Deliver positive pressure ventilations (PPV) – if Indicated*** ***** Transport immediately if unable to manage ventilations***	• The indications for the use of PPV include: - Agonal - Apnea - Decreased tidal volume in a patient with an altered mental status (AMS) - Bradypnea - < 8 breaths/minute and AMS - Tachypnea > 30 breaths/minute and AMS • A goal of oxygen administration is to deliver the minimum amount of oxygen to meet the needs of the patient and to maintain an oxygen saturation level at or above 94%. • When available, use pulse oximetry to guide oxygen delivery. The desired SpO_2 for most non-critical patients is 94-98%. • **SPECIAL CONSIDERATION:** For chronic obstructive pulmonary disease (COPD), the goal is to titrate oxygen to keep the SpO_2 at 88-92%. • Document the SpO_2 reading on the EMS Report or ePCR. **NOTE: Patients in shock always require high-flow oxygen**
♦ Assess **circulation**: (mnemonic COPS) • Capillary refill - *if appropriate* • Obvious external bleeding • Pulse – normal, too fast, too slow or absent • Skin - color, temperature, moisture	• Check the radial and carotid pulses at same time in critical situations. Check the femoral pulse if unable to obtain a carotid pulse. The radial pulse may be absent due to decreased blood pressure. • Capillary refill is most accurate in pediatric patients. It is NOT always accurate in adults due to chronically poor peripheral circulation. It is not accurate in cold environments. • Capillary refill can be assessed at any skin area such as fingernail bed, palm of the hand, chest, forehead, etc. If you will be using the ball of the foot in a pediatric patient, the child must be in a supine position. The most accurate site to check capillary refill is a central site (chest wall) vs. a peripheral site.
♦ Manage **circulation:** ** ***Manage life-threatening situations:*** • **Control *life-threatening external bleeding*** • ***If internal bleeding is suspected* or *if there is uncontrolled external bleeding, initiate immediate treatment and transport***	• Internal bleeding is not typically controlled in the field. Surgical intervention is usually required to stop the bleeding. • See Bleeding Control and Shock Management Skill Sheet. • Serial vital signs should be taken and monitored for trends. For signs and symptoms of deterioration, the patient should be transported ASAP to the MAR.
♦ Observe for deformities and **disabilities**: • Neurological deficits • Abnormal body position	• While observing for deformities, ask a conscious patient if they had any pre-existing disabilities. (If the patient is unable to move their lower extremities, this may have been from a previous injury). • Neurological deficits include facial droops, slurred speech, paresthesias, and paralysis. • Abnormal body presentations include tripod position, decerebrate, decorticate posturing, or contractures due to prolonged immobility.

Skill Component	Key Concepts
♦ **Expose and Visualize the** area associated with the preliminary complaint	• The preliminary complaint is the reason for summoning EMS to the scene. • While exposing the area associated with the preliminary complaint, avoid the inference of impropriety. Maintain patient modesty and dignity as much as possible. • If the patient is unresponsive, remove the patient's clothing while attempting to maintain the patient's privacy.
Formulate and Identify ♦ Form a field impression ** ***Manage life-threatening situations - if not already addressed*** ** ***Obtain blood glucose level - if altered level of consciousness***	• A field impression is formed based upon all of the information gathered by EMS personnel up until this point. It utilizes all information gathered earlier in the assessment. At this point, a determination is made as to whether the patient a priority patient or a non-priority patient. Ask yourself: Does the patient have a serious injury that requires prompt transport of does the patient have a minor and/or isolated injury that is NOT life threatening?
♦ ***Determine transport options:*** • **Level of transport ALS/ BLS** • **Mode of transport** • **Destination**	• In life threatening situation (e.g. unmanageable airway or uncontrollable hemorrhage) in which the ETA of the paramedics exceeds the ETA to the most accessible receiving (MAR) facility, EMTs should exercise their clinical judgment as to whether it is in the patient's best interest to be transported prior to the arrival of ALS. • EMT personnel may immediately transport hypotensive trauma patients with life-threatening injuries to the torso to the closest trauma center, not the MAR, when the transport time is less than the estimated time of paramedic arrival. The transporting unit should make every attempt to contact the receiving trauma center (via their dispatcher or by the use of a call phone). • Trauma patients who meet trauma center criteria should be assessed and treated while enroute to the designated Trauma Center (TC). • Mode of transport incorporates ground and air transport. • ALS and BLS providers should transport to the appropriate facility as indicated. See Los Angeles County Reference Nos. 502, 506, 508, 510, 511, 512, 513, 515, & 808.

SECONDARY ASSESSMENT

Skill Component	Key Concepts
♦ Perform the appropriate level of assessment: • Priority (Unstable patients) (priority) – Rapid trauma assessment while enroute • Stable patients: – Focused exam while on scene	• The information/observations you obtained during the primary assessment determine which type of physical exam is needed during the secondary assessment (rapid vs. slower). • If the patient is deemed "stable" and has an isolated injury, you may perform an assessment while still on scene. • A stable patient is defined as having vital signs within normal limits; the patient is conscious and comfortable. • If the patient is deemed to be a priority patient, perform a rapid trauma (head to toe) exam. • A patient is considered a priority patient if the assessment reveals an immediate threat to life i.e. vital signs that are abnormal and S/S of shock. • A rapid trauma assessment should be done when a patient is unresponsive or has sustained major trauma. It should take no longer than 60-90 seconds. Scene time should not exceed 10 minutes for a patient with life-threatening injuries unless there are extenuating circumstances.

	Continued… • If the patient has a minor or isolated injury, perform a slower, focused exam of the particular body region that is associated with the injury. • The secondary assessment allows you to obtain additional information in order to determine and establish priorities for treatment. **IT SHOULD NOT BE TREATED AS COOKBOOK MEDICINE** and other options must always be considered. Changes in the patient's condition may require additional assessment parameters.
Skill Component	**Key Concepts**
♦ Perform a <u>rapid</u> trauma assessment for all priority patients. After the primary assessment <u>briefly</u> assess and palpate: • head • pelvis • neck • lower extremities • chest • upper extremities • abdomen • back	• A rapid trauma assessment is a brief inspection and palpation of the body. It reveals life-threatening injuries which must be treated immediately and require rapid transport. The assessment should take only 60-90 seconds. • A rapid trauma assessment includes all DCAP BTLS elements and must be performed as quickly as possible or take no long loner than 60-90 seconds.
♦ Assess the current chief complaint of the patient: **<u>SAMPLE History Assessment</u>** • **S**igns/**S**ymptoms - OPQRST for current complaint • **A**llergies • **M**edications • **P**ertinent history - age - weight - under physician's care/private medical doctor - pertinent medical/surgical history • **L**ast oral intake (last meal or when medication taken) - *<u>if pertinent</u>* ***<u>OR</u>*** • **L**ast menstrual period • **E**vent leading to injury	• Assessing the current chief complaint assists with identifying the current injury. • The age for pediatrics in Los Angeles County is 14 and under. • The pediatric emergency resuscitation tape shall be used to obtaining an infant's or a child's weight, and dosages of pain medications in all children 14 and under. • OPQRST is a mnemonic used to assess pain and shortness of breath. **It should only be used with a minor trauma patient who is conscious and fully oriented.** - **O**nset – What caused the pain to occur? What was the patient doing at the time the pain started? Was the onset gradual or rapid - **P**rovokes – What makes it worse? **P**alliative – What makes it better? **P**osition – What position is the patient found in? - **Q**uality – How does the patient describe the pain? (Burning, stabbing, crushing, dull, heaviness). Is the pain constant or intermittent? - **R**egion – area involved, **R**adiation – does the pain/discomfort spread from origin, **R**ecurrence – has this occurred before - **S**everity – pain scale - **T**ime – when did the problem/pain begin and what is the duration of time • Obtaining information such as whether the patient is under a physician care and the name of primary medical doctor or health plan assists with determining the patient's medical history and transport destination. If the patient is unable to speak, o*btain information from family or bystanders* • A pertinent medical history refers to past medical history that is relevant to the chief complaint/problem such as a heart condition, pulmonary problems, hypertension, diabetes, CVA, syncopal episode, or recent surgery. Ask yourself "did the patient have a syncopal episode and then fall?" • The last oral intake is important when there is a possibility that the patient may require surgery or if there is a potential for aspiration.

Skill Component	Key Concepts
♦ Assess vital signs: • Cardiac status - pulse - rate, rhythm, quality • Respiratory status - respirations - rate, effort, tidal volume - breath sounds Continued… - oxygen saturation SpO_2% (Pulse oximetry - ***if available*** • Blood pressure (systolic and diastolic) • Skin signs - color - temperature - moisture • Pain ** ***Re-evaluate the effectiveness of all primary assessment interventions performed - if applicable*** ** ***For non-critical patients, titrate oxygen to maintain a SpO_2 reading between 94-98%*** ** ***For patients with COPD, titrate oxygen to maintain a SpO_2 reading between 88-92%***	• A complete set of vital signs are taken and counted at this time. • The SpO_2 reading must be documented on the EMS Report or ePCR. • The pulse oximetry device measures the amount of hemoglobin that is saturated with oxygen. • When rapid chest auscultation is indicated, auscultate for the presence and equality in ***all lung fields*** • When assessing a blood pressure on the patient, determine both a systolic and diastolic B/P by using the auscultation method. The palpation method only measures the systolic blood pressure. The only time the palpation method is appropriate is if you are unable to hear the pulsations when attempting to auscultate. • Palpating a blood pressure in order to save time is not acceptable as the palpation method does not provide a diastolic blood pressure, which is necessary to determine the presence of significant medical conditions such as a rise in intracranial pressure. • An evaluation of the condition of the skin involves assessment of color, temperature, and moisture. • All patients must be assessed for presence and absence of pain. Document what patient states the pain level is using the 0 - 10 scale. (0 = no pain, 10 = excruciating pain). EMS providers explain what the scale represents in order to receive an accurate rating from the patient. Prehospital providers MUST document what the patient states and not the provider's perception of the pain level. **NOTE: Patients in shock always require high-flow oxygen**
♦ Examine neurological status • Comprehensive orientation level: - Person, place, time, or event • Glasgow Coma Scale (GCS) - eyes, verbal, motor • Pupils – equal size, round, react to light (PERRL) and movement - ***if indicated*** • Extremities-circulation, movement, strength, sensation ** ***Perform glucose check – if indicated***	• Comprehensive orientation level involves three (3) parameters: Person, place, time, or event. • Glasgow Coma Scale (GCS) *assesses the eyes, verbal, and motor responses.* • Neuro symptoms described by the patient may include headache, blurred vision, photophobia, dizziness, paresthesia, etc. • Assess each extremity individually and then compare findings. • The patient must have decision making capabilities to refuse treatment or transport. See Los Angeles County Reference No. 834. • Hypoglycemia is defined as a blood sugar < 60mg/dL
♦ Re-evaluate transport decision to appropriate facility	• See Los Angeles County Reference Nos. 502, 506, 508, 510, 511, 512, 513, 515, 518, 521, 808.
♦ Perform detailed physical examination that is relevant to the body region associated with the injury ** ***Manage specific injury appropriately on scene or enroute - as indicated***	• A detailed physical examination entails a complete body check on scene for a trauma patient. ***EXCEPTION –*** if the patient is too unstable to remain in the field, EMS personnel should use their best judgment to transport immediately and attempt to perform a detailed physical examination enroute. • A detailed physical examination entails a rapid body check for an unconscious patient. • Look for anything that is abnormal or does not fit the situation.

PHYSICAL EXAM – Complete Body Check (Head to Toe)

NOTES: 

In addition to a performing a rapid trauma assessment on a priority patient, you must perform an additional complete body check while enroute to the hospital

Stable patients only require a focused assessment to be performed on the region of the body that is associated with their injury. If in doubt, perform a complete head to toe evaluation while enroute to the hospital.

Skill Component	Key Concepts
♦ Assess **ALL** body regions for **DCAP/BTLS**:: • Deformity (visible and palpated) • Contusions • Abrasions • Penetrations / Punctures • Burns / Bruises • Tenderness • Lacerations • Swelling / Scars ♦ **Palpate for**: • Tenderness • Instability • Crepitus	• The purpose of performing a physical exam during the secondary assessment is to look for the presence of hidden injuries that may compromise the patient's condition and warrant more definitive care. • Performing a logical and systematic physical assessment of the patient may only focus on a certain area or body region based upon the statements made by a conscious patient. • Scene circumstances and patient presentation may dictate the level of the assessment performed while on scene or enroute. • For unconscious/unresponsive patients, perform a rapid trauma assessment (head to toe). • Definition of Crepitus: - grating of bone fragments - crackling of joints - air or gas in soft tissue (subcutaneous emphysema)

NOTE: 

In each of the following body regions, you first assess for DCAP/BTLS. Then assess each area of the body for the additional assessment elements

♦ Assess the **HEAD - Skull, Eyes, Ears, Nose, Mouth, Face** **Additional Assessment Elements:** • Asymmetry of head and face • Drainage • Raccoon eyes • Battle's sign • Soot and singed nasal or facial hairs ** ***Maintain patent airway***	• Adults – Using a head-to-toe approach for examination works the best. • Children – Using a toe-to-head approach for examination works the best for gaining the child's confidence. • Asymmetry of the head and face may be due to a medical problem such as stoke or Bell's Palsy (unilateral facial paralysis of sudden onset and unknown cause). • Battle's sign is bruising over the mastoid process, which indicates a basilar skull fracture or a fracture of the temporal bone. • Raccoon eye(s) is the bruising of one or both orbits that indicates fracture of the sphenoid sinus. • Battle's sign and raccoon eyes take time to develop. Therefore, they are not typically seen right after an injury. If they are seen during an assessment, they may be due to a previous injury. • Fluid drainage from the ear or nose also may indicate a cerebral spinal fluid leak resulting from a basilar skull fracture.

Skill Component	Key Concepts
♦ Assess the **NECK/CERVICAL SPINE** **Additional Assessment Elements:** • Track marks and tattoos • Medical alert tags • Jugular vein distention (JVD) • Tracheal deviation • Accessory muscle use • Carotid pulses • Subcutaneous emphysema (crepitus) ** ***Maintain SMR - if indicated*** ** ***Apply occlusive dressing - if puncture wound to neck***	• Palpating both carotid arteries at the same time simultaneously will cut off the blood supply to the brain. • Full face helmets should be removed to allow access to the patient's airway and provide in-line immobilization of the head and neck. • **DO NOT REMOVE** shoulder pads or custom fitted helmets such as football or hockey helmets unless respiratory distress is coupled with inability to access the airway. Remove face guard with rescue scissors or a screwdriver. • Leave infants and children in safety seats for assessment and for controlled spinal immobilization. Remove them only if the seat is damaged, child requires further assessment, or life-threatening treatment that cannot be performed in the safety seat. • Pad (shim) patients to maintain a neutral position and restrict movement on a long spine board: - Adults - head and neck for comfort and to prevent hyper-extension - Infant or child - immobilize in child safety seat, if possible, or - pad neck and shoulder area to maintain alignment if placed on long spine board. - Elderly - head and neck to maintain comfort and prevent hyper-extension, airway obstruction, and skin breakdown - Athletes - head and neck to prevent hyper-extension, if the shoulder pads are in place, and the helmet is removed
♦ Assess the **CHEST – Clavicles, Sternum, Ribs** **Additional Assessment Elements:** • Paradoxical movement • Accessory muscle use • Sucking chest wound • Subcutaneous emphysema (crepitus) ** Assess breath sounds in all lung fields – if not assessed previously ** ***Apply occlusive dressing to sucking chest wound - if indicated***	• Maintaining patient modesty when performing chest palpation/auscultation assists with avoiding an inference of impropriety. • If the patient has and open wound to the chest, cover it with a commercial chest seal or an occlusive dressing. • While assessing the chest, also determine if the patient has a pacemaker or an internal cardiac defibrillator (ICD). • Lung sounds should be assessed in all fields, if possible. • Paramedics must perform chest decompression once a tension pneumothorax is suspected to prevent the development of obstructive shock.
♦ Assess the **ABDOMEN** **Additional Assessment Elements:** • Distention • Rigidity/guarding • Pulsating mass • Signs of pregnancy and/or complications • Subcutaneous emphysema (crepitus)	• EMS providers should palpate each of the 4 quadrants one time only to assess for rigidity and guarding. If the patient is complaining of abdominal pain, begin palpating the quadrant furthest away from the pain. • Use finger pads of the first 3 fingers to palpate the abdomen. DO NOT use finger tips. • Rebound tenderness should not be assessed in the field. It causes severe pain and prehospital treatment does not change. - Rebound tenderness *is a diagnostic sign-for testing for peritoneal irritation caused by infection or internal bleeding.* • Guarding is the reflexive tightening of abdominal muscles as depth of palpation is increased. • Pregnancy related complications are; contractions, vaginal bleeding, rigid abdomen, back pain, etc. • The assessment finding of subcutaneous emphysema (crepitus) is only felt if the patient has developed gas gangrene (potentially deadly form of tissue death). It is caused by an anaerobic microorganism infection at the site of a recent surgical or traumatic wound. Gas gangrene develops rapidly and is often fatal.

Skill Component	Key Concepts
♦ Assess the **PELVIS** **Additional Assessment Elements:** • Femoral pulses • Incontinence • Priapism • Signs of pregnancy and/or complications • Vaginal bleeding	• **DO NOT** rock the pelvis or compress the iliac crests. The mechanism of injury, presence of back and abdominal pain is used to assess the pelvis without palpation. • Pelvic injuries are critical and have the potential for major blood loss. DO NOT palpate if there are obvious pelvic injuries or patient complains of pelvic pain, but transport immediately, if not already enroute. • Palpating femoral pulses is useful in the elderly if circulation to extremities is diminished. Maintain modesty and dignity and palpate in a manner as to avoid inference of impropriety. • Pregnancy related complications are; contractions, vaginal bleeding, rigid abdomen, back pain, etc. • Priapism is a prolonged painful penile erection not associated with sexual stimulation. It may be caused by: - blood disorders such as Sickle cell anemia and leukemia - prescription medications used for erectile dysfunction, antidepressants, psychiatric disorders, anti-anxiety and blood thinners - illicit or recreational drugs - spinal cord lesions - spinal cord trauma - envenomation from the bite of a scorpion, black widow spider.
♦ Assess the **LOWER EXTREMITIES** **Additional Assessment Elements:** • Track marks and tattoos • Medical alert tags • Pedal pulses • Motor movement and function • Sensation	• Compare bilateral pulses, motor movement, and sensation. • Abnormal sensations may be tingling, burning or numbness.
♦ Assess the **UPPER EXTREMITIES** **Additional Assessment Elements:** • Tract marks and tattoos • Medical alert tags • Brachial/radial pulses • Motor movement and function • Sensation	• Compare bilateral pulses, motor movement, and sensation. • Abnormal sensations may be tingling, burning or numbness.
♦ Assess the **BACK - Posterior Thorax, Lumbar, Buttocks** **Additional Assessment Elements:** • Subcutaneous emphysema (crepitus) • Assess posterior lung sounds • Entrance and exit wounds	• Log roll patient if there is a suspicion of a spinal injury. • Assess breath sounds in all posterior locations. • Roll patient directly onto backboard once examination is complete.
♦ Formulate a Provider Impression	• Each patient encounter begins by utilizing a structured approach to completing a patient assessment. Determining the chief complaint leads to an assessment. The assessment then leads to formulating a Provider Impression. • The provider impression drives the treatment that should be implemented (management decisions). • Provider impressions were mandated by the State and most EMS Providers have now begun to implement them in their everyday practice.

	Continued… • Some provider impressions are broad and require further clarification in EMS documentation. For example, if a medical patient is unconscious, unresponsive, and pulseless, the provider impression is Cardiac Arrest – Non-Traumatic. • The provider impression is not a diagnosis, it is the EMS provider's sense of what is wrong with the patient. It can change depending upon additional assessment information gained.

REASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
♦ Reassess a patient at least every **5 minutes for priority** patients and every **15 minutes for stable** patients. • Primary assessment • Relevant portion of the secondary assessment • Vital signs ***** Manage patient condition as indicated.***	• Priority patients are patients who have abnormal vital signs, S/S of poor perfusion, if there is a suspicion that the patient's condition may deteriorate, or when the patient's condition changes. • Evaluating and comparing prior assessment findings assists with recognizing if the patient is improving, responding to treatment, or if their condition is deteriorating.
♦ Evaluate response to treatment	• Patients must be re-evaluated at least every 5 minutes if any treatment was initiated or medication administered.
§ Explain the care being delivered and the transport destination to the patient/caregivers	• Communication is important when dealing with the patient, family, or caregiver. This is a very critical and frightening time for all involved and providing information helps in decreasing anxiety.
§ Give patient report to equal or higher level of care provider **Exception**: *Report may be given to a lower level of care provider when an ALS to BLS downgrade has occurred*	• Report should consist of all pertinent information regarding the assessment findings, treatment rendered and patients response to care provided.

Developed 11/99: Revised 10/2017

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

PATIENT ASSESSMENT & MANAGEMENT
Supplemental Information

NOTES:

- The preliminary chief complaint is the reason for summoning EMS to the scene.
- The general impression is determined by EMS personnel utilizing information gathered early in the assessment.
- Repeat the primary assessment at least every 5 minutes for priority patients and every 15 minutes for stable patients.
- Priority patients are patients who have abnormal vital signs, S/S of poor perfusion, there is a suspicion that the patient's condition may deteriorate, treatment was rendered or when the patient's condition changes.
- Trauma patients with chest injuries and having difficulty breathing or signs of shock should be assessed for bilateral breath sounds during the primary assessment to determine possible tension pneumothorax.
- DO NOT rock the pelvis or press on iliac crest if suspected pelvis fracture. Mechanism of Injury and back and abdominal pain are used to assess the pelvis without palpating for injury.
- A patient with a respiratory rate is outside of the normal range and has inadequate tidal volume accompanied by altered level of consciousness and abnormal skin signs needs positive pressure ventilation.
- Capillary refill can be taken at any skin area such as fingernail bed, palm of the hand, chest, forehead, etc. If using the ball of the foot in pediatric patients, the child must be in a supine position. The most accurate site is a central site, such as the chest wall rather than a peripheral site.
- A patient has "Decision Making Capacity" if he/she can:
  - Understand the nature and consequences of proposed health care, which includes the risks and benefits of refusing care
  - Has the ability to make and communicate a decision regarding the proposed health care.
  - Can relate the above information to their personal values (See Los Angeles County Reference No. 834, Patient Refusal of Treatment, or Transport.
- The lack of decision-making capacity to refuse treatment and/or transport may be due to:
  - Temporary loss – e.g. due to unconsciousness, being under the influence of mind altering drugs, mental illness, or cognitive impairment.
  - Permanently lost – due to irreversible coma, persistent vegetative state, un-treatable brain injury, or dementia.
  - Never existed – e.g. due to a profound neurodevelopmental disorder, those who are deemed by the Court as incompetent or a person under conservatorship.
- Trauma conditions can be evaluated by using the mnemonic OPQRST:
- OPQRST is a mnemonic used to assess pain and shortness of breath. **It should only be used with a patient who is conscious and fully oriented.**
  - **O**nset – What caused the pain to occur? What was the patient doing at the time the pain started? Was the onset gradual or rapid
  - **P**rovokes – What makes it worse? **P**alliative – What makes it better? **P**osition – What position is the patient found in?
  - **Q**uality – How does the patient describe the pain? (Burning, stabbing, crushing, dull, heaviness). Is the pain constant or intermittent?
  - **R**egion – area involved, **R**adiation – does the pain/discomfort spread from origin, **R**ecurrence – has this occurred before
  - **S**everity – pain scale
  - **T**ime – when did the problem/pain begin and what is the duration of time
- GCS Eye Opening (awake or unresponsive), verbal response, motor response (Normal 4-5-6)

Los Angeles County Eye Opening (awake or unresponsive), verbal response, motor response, (Normal 4-5-6)

Eye Opening	Verbal Response	Motor Response
Stimuli needed for patient to open eyes	Best communication when questioned	Best response to command or stimulus
4 = spontaneous 3 = responds to voice 2 = responds only to painful stimuli 1 = no response	5 = oriented , converses normally 4 = confused, disoriented 3 = inappropriate words or phrases 2 = incomprehensible sounds 1 = makes no sound	6 = obeys commands 5 = localizes stimulus (purposeful) 4 = flexion, withdraws from stimulus 3 = abnormal flexion (spastic) (*decorticate posturing)* 2 = extension (rigid) (*decerebrate posturing*) 1 = makes no movement

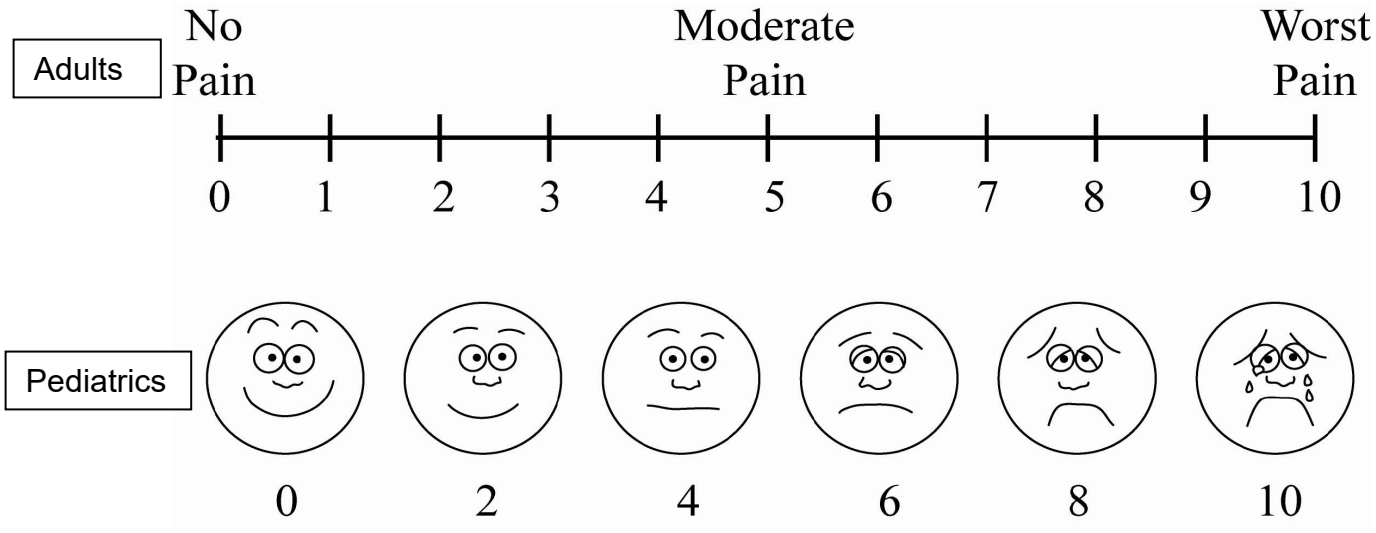
PATIENT ASSESSMENT & MANAGEMENT TRAUMA

Supplemental Information (Continued)

COMPONENTS OF A TRAUMA BAG:		
Adhesive dressings (Band-Aids®	**Dressings – Trauma, 4X4, Vaseline**	**Gauze bandages**
Trauma shears	**Splints – long, short, and traction**	**Extrication device**
Commercial chest seals	**Tape – assorted sizes**	**Head immobilizer device**
Tourniquets	**Occlusive dressing / Vaseline gauze**	**C collars**
Hemostatic dressings	**Normal saline irrigation**	**Flashlight**
PPE Gloves/gown/goggles	**Burn pack or burn sheet**	
COMPONENTS OF AN AIRWAY BAG:		
BMV devices – adult, child, infant	**Portable suction**	**Pulse Oximeter**
OP/NP airways – all sizes	**Suction equipment– various sizes**	
Nasal cannula	**Portable oxygen cylinder and oxygen regulator**	
Simple face mask – adult, child, and infants	**Pulse Oximeter**	
Non-rebreather – adult, child, and infants	**Water soluble lubricant**	

PERTINENT QUESTIONS FOR COMPLAINTS OF PAIN / DISCOMFORT

- When did the pain/discomfort first begin? (minutes - weeks)
- What caused the pain? (acute vs. chronic)
- How do you describe the pain? (i.e. sharp, ache, squeezing, burning, etc.)
- Area effected and if focal or diffuse
- Pain moves to another area away from its origin
- Constant or intermittent
- 0 - 10 pain scale (initial event and ongoing assessment)
- Duration



MEDICAL CONTROL GUIDELINE: SPINAL MOTION RESTRICTION (SMR)

DEFINITION: Spinal Motion Restriction (SMR) describes the procedure used to care for patients with possible unstable spinal injuries. SMR includes: Reduction of gross movement by the patient; prevention of additional damage to the spine; and regular reassessment of motor/sensory function.

PRINCIPLES:

1. There are multiple methods of SMR; current evidence does not support any one method over another. In addition, there are harmful side effects of SMR that must be considered.

2. SMR Methods : (least to most invasive) cervical collar in fowler's, semi-fowler's or supine on the stretcher, vacuum mattresses/ scoops / skeds, shortboards and keds, backboard and head blocks with straps.

3. Prehospital provider assessment will determine what method is needed. Every patient with trauma must receive an assessment. If any assessment component is positive, the patient requires SMR.

4. Prehospital provider should use judgment and consider less invasive means of SMR for patients without neurologic findings, but in whom one is still concerned for unstable spinal injury.

5. Ambulatory patients generally do not need a backboard.

6. SMR for penetrating injuries is generally not indicated and transport must not be delayed to apply SMR. Treatment of patients with penetrating trauma should not involve a backboard unless it is required as an extrication device or if there is a significant concomitant blunt mechanism.

7. Safe and proper removal of the helmet should be done by two people following steps outlined in an approved trauma curriculum.

8. Once SMR has been initiated based upon prehospital provider assessment, only hospital personnel should discontinue it. However, if a patient is not tolerating a particular method of SMR, alternate methods may be used when appropriate. In particular, management of the patient's airway may necessitate alternate SMR and should take precedence.

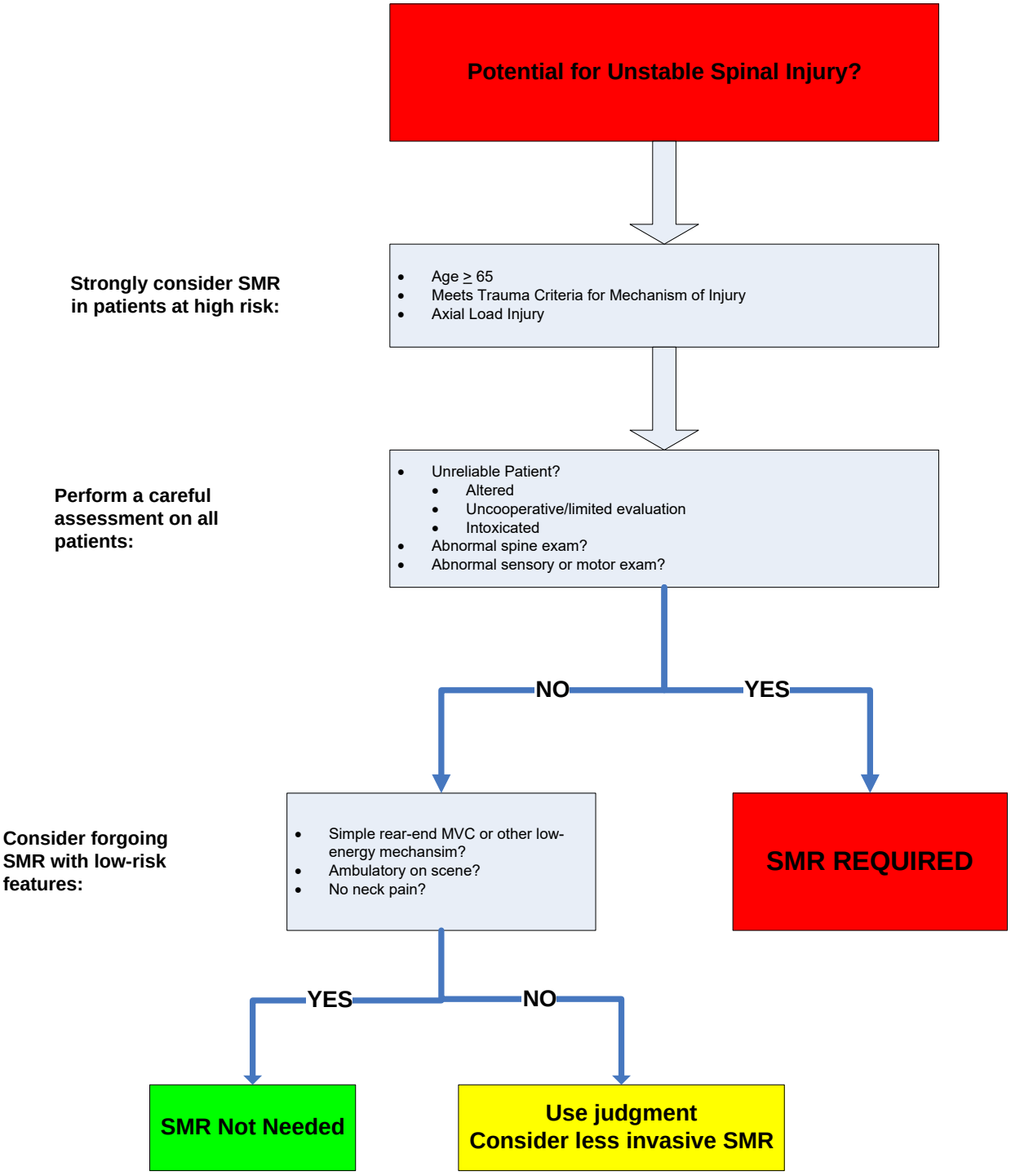
GUIDELINES:

1. An unreliable patient is anyone who is altered or intoxicated. Limited evaluation may be due to communication barrier, uncooperative patient or patient too distracted by other injuries and circumstances.

2. An abnormal spine exam is any deformity or tenderness along the spine.

3. Neurological examination includes: A) Test of sensation and abnormal sensation (parasthesias) in all 4 extremities B) test of motor skills in all 4 extremities with active movements by the patient (avoid just reflexive movements like hand grasp) to include: wrist/finger extension and flexion, foot plantar and dorsiflexion C) Frequent reassessment.

ADULT ALGORITHM:



PEDIATRIC GUIDELINES:

1. SMR requires the patient's head, neck and torso to be appropriately stabilized.

    a. < 3 years – cervical collar plus backboard with occipital recess or thoracic padding plus straps to secure patient to the board

    b. 3-14 years - cervical collar plus backboard with thoracic padding as needed plus straps to secure patient to the board

2. Infants in rear facing car seats may be immobilized and extricated in the car seat as long as the patient is stable and does not exhibit signs of respiratory distress or shock.

3. Children restrained in a car seat with a high back should be extricated in the car seat and then be placed in SMR as appropriate.

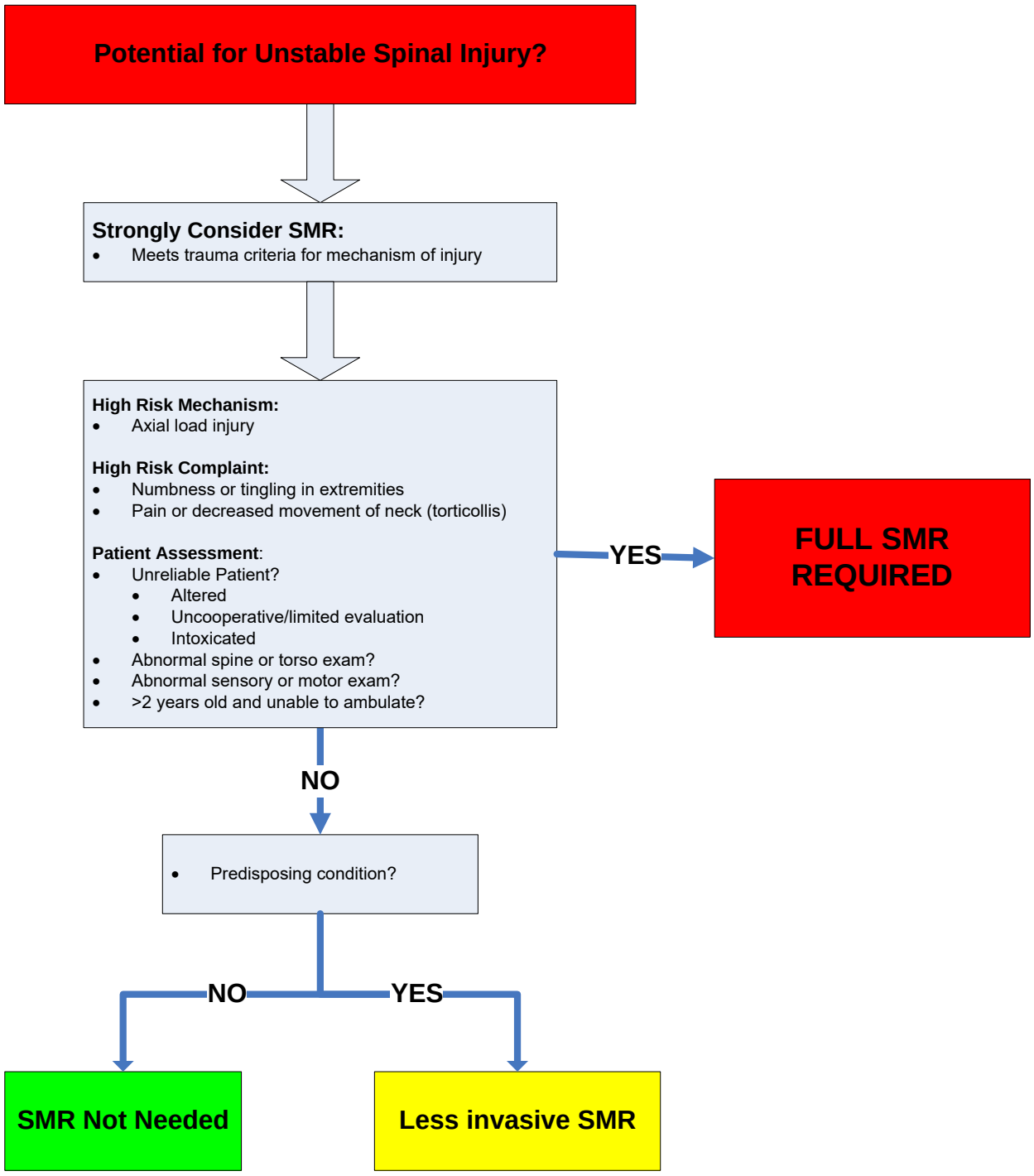
4. Children in booster seats (without a back) should be placed in SMR as appropriate.

5. Predisposing conditions are any of the following: Family members who fracture bones easily, child with spinal deformity, dysmorphic features, or childhood rheumatoid arthritis.

    [Specific conditions include: Down syndrome, hydrocephalus, dwarfism (achondrodysplasia), Klippel-Feil syndrome, mucopolysaccharidosis, Ehlers-Danlos syndrome, Marfan syndrome, osteogenesis imperfecta, Larsen syndrome, juvenile rheumatoid arthritis, juvenile ankylosing spondylitis, renal osteodystrophy, rickets, scoliosis, history of cervical spine injury /surgery.]

6. Abnormal torso exam refers to evidence of substantial torso injury, defined as injuries thought to be potentially life threatening to the thorax including the chest wall, abdomen, flanks, back and pelvis with an unstable chest wall, abdominal distension or significant chest or abdominal tenderness.

PEDIATRIC ALGORITHM



EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

NEUROLOGICAL EMERGENCY / SPINAL MOTION RESTRICTION (SMR)
LONG SPINE BOARD

PERFORMANCE OBJECTIVES

Demonstrate proficiency in performing and directing team members in spinal motion restriction using a long spine board.

Perform and direct team members to apply a cervical collar, log roll and secure a patient onto a long spine board. Necessary equipment will be adjacent to the manikin or brought to the field setting.

CONDITION

The EMT is the designated Team Leader on a patient who requires full Spinal Motion Restriction (SMR). There is no need for rapid extrication. Necessary equipment will be adjacent to the patient or brought to the field setting.

EQUIPMENT

Live model or manikin, various sizes of rigid collars, long spine board, straps or binders, head-neck immobilizer, padding material, 2-3" cloth tape, 2-3 assistants, goggles, various masks, gown, gloves.

PERFORMANCE CRITERIA

- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation (BSI) precautions	• Mandatory personal protective equipment - gloves
♦ Assess the environment for scene safety	• Check for airbag deployment. If the airbags did not deploy, use caution during assessment and extrication. You may need to request the appropriate resources deactivate the air bag system. • Ensure the vehicle is turned off. Motors on electric vehicles are very quiet. • If you are in a confined space, ensure the area is safe from falling debris in confined space.
♦ Evaluate the need for additional BSI	• Situational - goggles, mask, gown
♦ Determine the level of SMR required ***Request additional three (3) additional rescuers if SMR is indicated***	• Refer to Los Angeles County Reference Number 1360 • SMR is best achieved by four (4) rescuers: 1. Team Leader 2. Head – 3. Hips/Abdomen 4. Legs • The Team Leader is typically positioned at the chest and is the one (1) responsible for giving directions to the additional rescuers. • The sole job of the patient at the head is to minimize movement of the head and neck.
♦ Approach the patient from the front – *if possible*	• Approaching the patient from the front, whenever possible, will hinder the patient from having to turn his/her head to look at the EMS provider.
♦ Evaluate the need for additional BSI	• Situational - goggles, masks, gown
♦ Direct the patient not to move or turn his/her head: • Explain importance of remaining still • Explain the care being delivered	• Keeping the head still will decrease the potential for further injury. • Providing an explanation of the procedure may assist with decreasing anxiety and promote more cooperation.

PROCEDURE	
Skill Component	**Key Concepts**
<u>TEAM LEADER:</u> ♦ Place the patient's head in neutral in-line position and maintain axial stabilization throughout procedure - *<u>unless contraindicated</u>* *****Relinquish manual stabilization of the head/neck to an assistant as soon as they arrive*** *****Direct the assistant to take over maintaining manual stabilization of the patient's head and neck*** *****Ensure manual stabilization is always maintained during the switch***	• Axial stabilization of the neck results in manual stabilization of the head and neck. • Maintain manual stabilization of the patient's head and neck until movement of the patient's head is restricted by the application of a cervical collar and the extrication device. • Depending on the situation, the rescuer who initiates and/or maintains axial stabilization may be positioned either behind or at the side of the patient. • The team leader is responsible for the patient assessment and for directing patient care and should NOT be the rescuer to <u>physically maintain</u> SMR of the spine. • To prevent extension, flexion, lateral bending, or rotation of the head, place your thumbs facing anteriorly just below the zygomatic arches and spread fingertips along the sides of the face with the little fingers touching the base of the occiput. **DO NOT** apply traction. • The sole focus of the rescuer at the head and neck of the patient should be to maintain axial stabilization throughout the procedure. • SMR begins with manual control of the head and neck. The C-collar is applied <u>after</u> the primary and neck assessment is completed. • **NEVER** apply traction when restricting the motion of the neck. • **DO NOT** attempt to move the head into an in-line position if the head is grossly misaligned (no longer extends from midline). • Move the head into an in-line position. Movement of the head and neck must be limited, and should be restricted to the position it was initially found if any of the following conditions are present: - head is grossly misaligned (no longer extends from midline) - moving the head into a neutral in-line position results in: ~ compromising airway or ventilation ~ initiating or increasing muscle spasms of the neck ~ increasing neck pain ~ initiating or increasing neurological deficits ~ encountering resistance when attempting to move the head of an unconscious patient • Initially, the head of an adult may need to be held off the ground until appropriate padding can be secured to achieve a neutral position and prevent hyperextension.
♦ Directs an assistant to take over maintaining manual stabilization of the patient's head and neck	
♦ Ensures manual stabilization of the head and neck is maintained always during the switch	
♦ Directs an assistant to remove the patient's shoes and socks	• When shoes and socks are left on the patient, assessing feet for circulation, motor movement/function and sensation, cannot be properly assessed.

Skill Component	Key Concepts
♦ Assess the distal extremities for: • **C**irculation/Pulse • **S**ensation • **M**otor movement } CSM	• Asses the condition of the extremities prior to moving the patient and when SMR procedure has been completed. • **C**irculation/Pulse - palpate for the distal pulses in the extremities and mark with an "X." Check for pulse characteristics, color, temperature, capillary refill. • **S**ensation - determine numbness or tingling and sensitivity to touch. • **M**otor movement - have patient wiggle fingers or toes.
♦ Assess neck/cervical spine for **DCAP-BTLS TIC**	• **DCAP/BTLS TIC** is a mnemonic used for a rapid trauma assessment. These elements act as guide for the assessment information that is specific to each body part. • Most cervical collars have an opening at the anterior neck, which allows for only limited examination. Therefore, the neck must be thoroughly assessed prior to the application of the cervical collar. • Check for a tracheostomy stoma. If stoma is present, immobilize head and neck with approved head immobilizer device and **DO NOT** apply cervical collar. • Placing a cervical collar on patients who have a stoma is extremely dangerous due to the possibility of the collar shifting and occluding the airway. • Assess for DCAP/BTLS: - Deformity (visible and palpated) - Contusions - Abrasions - Penetrations / Punctures - Burns/bruises - Tenderness - Lacerations - Swelling / Scars • Palpate for: - Tenderness - Instability - Crepitus • Additional Assessment Elements: - Track marks and tattoos - Medical alert tags, jewelry - Jugular vein distention (JVD) - Tracheal deviation - Accessory muscle use - Subcutaneous emphysema (crepitus) - Stoma • Medical Devices: - Tracheostomy - Central venous catheters

Skill Component	Key Concepts
♦ Size and apply cervical collar using the appropriate technique *****Ensure that collar does not obstruct the airway, or hinder mouth opening, ventilation or circulation***	• Cervical collars do not accommodate an angulated or rotated head. Therefore, **DO NOT** attempt to apply a cervical collar if the head is not in an in-line position. • If the patient has a stoma, **DO NOT** apply a cervical collar Utilizing a "head immobilizer" device will restrict the motion of the head and neck. *Placing a cervical collar on a patient who has a stoma may compromise the airway.* • Cervical collars **DO NOT** immobilize the neck. They allow for 25-30% of motion by flexion and extension and up to 50% for other types of motion. • A unique function of the cervical collar is to rigidly maintain a minimum distance between the head and neck to eliminate intermittent compression of the cervical spine. • An incorrectly sized cervical collar may cause hyper-flexion, hyperextension, or compression of the trachea/carotid arteries/large veins of the neck, and increased patient discomfort. • A cervical collar that hinders the mouth from opening may lead to aspiration if the patient vomits. • Improperly sized cervical collars sized may result in complications if: - **<u>too loose</u>** it is ineffective and can cover the anterior chin, mouth, and nose resulting in airway obstruction. - **<u>too tight</u>** it can compress the carotid arteries and neck veins. - **<u>too short</u>** it will not protect the cervical spine from compression and allows for significant flexion. - **<u>too tall</u>** it will cause hyperextension of the head. • There are times when a patient's neck cannot be properly fitted with a cervical collar at all. In these cases, improvised devices must be used (towel roles, trauma dressings, rolled blankets) in an attempt to restrict the movement of the patient's head and neck.
♦ Check for signs and symptoms of obstructed breathing: - Choking - The patient cannot speak – *if conscious* - Coughing - Cyanosis	• Direct pressure on the anterior neck may result in compression of the trachea/carotid arteries or large veins of the neck.
♦ Ensure that all team members are in the proper position prior to log rolling the patient	• Position team members appropriately to turn patient: ➢ ***<u>4 team members</u>*** - 1st assistant - remains at head - Team leader - near mid-chest with one hand on patient's shoulder and the other on patient's hip and securing near arm with knees - 2nd assistant - by hips with one hand above patient's waist and the other below patient's knee and securing far arm to lateral upper thigh Continued…

	- 3rd assistant - by knees with one hand on patient's mid-thigh and the other below patient's calf • Four (4) team members are preferable in maintaining proper spinal alignment during a log roll, but use three (3) team members if necessary. • Team leader should not remain at head of patient for C-spine control since he/she is in charge of assessment and total patient care. • Control the near and far arm during the log-roll. Extend the arms at the sides with palms inward. Roll the patient onto one arm to provide proper spacing and acts as a splint for the body (turn patient only onto an uninjured arm). • **DO NOT** raise the arm above the head or place the arms anteriorly. This interferes with head and neck alignment and results in movement of the spine. ➢ ***3 team members*** - 1st assistant - remains at head - Team leader - near mid-chest with one hand on shoulder and other hand on upper thigh and securing near arm with knees - 2nd assistant - near upper legs with one hand on hip and other hand below knee and securing far arm to lateral upper thigh
Skill Component	**Key Concepts**
♦ Direct one (1) assistant to bring and position the long board parallel to the patient on the opposite side of the rescuers	• Either the team leader at the mid-chest area or assistant at the hip-thigh area may pull board over. However, it is more difficult for the person at the chest area to reach over the patient without compromising SMR.
♦ Give the signal and log roll the patient towards the team members while maintaining body alignment	• The team leader should give the command to turn the patient. However, if this role is relinquished, the team leader must make it clear who will be giving the command. • Communication regarding when to turn the **patient must be clear and concise to minimize the possibility of compromising spinal alignment.**
♦ Assess the back without compromising spinal alignment: • Use one (1) hand to hold the shoulder • Use the other hand to palpate for injuries, tenderness and deformity	• The patient must be turned as a unit only far enough to inspect the back and roll patient onto the backboard. (Bring the board to the patient) • Grasping the clothing to turn the patient may result in compromising spinal alignment during log roll if the clothing gives way or tears.
♦ Direct the assistant near patient's hips to slide the board into position next to patient	
♦ Give the signal to roll the patient back onto the board while maintaining body alignment	• The team leader should give the command to turn the patient back onto the board. However, if this role is relinquished, the team leader must make it clear who will be giving the command. • Communication regarding when to turn the patient must be clear and concise to minimize the possibility of compromising spinal alignment no matter who gives the call.
Skill Component	**Key Concepts**
♦ Center the patient vertically on the board angling	• Sliding the patient in this manner prevents jerking movements

the patient towards center by: • sliding the patient towards foot of board **THEN** • sliding the patient towards the head of board	and maintains the alignment of head, shoulders, hips and legs as patient is centered onto the board.
♦ Fill in the spaces between the body and the board or straps with padding - <u>if indicated</u> • <u>Occipital padding</u> for an adult or older child • <u>Shoulder padding</u> for a young child, toddler or infant • <u>Spaces between</u> torso, hips, and legs and the edge of the board or straps	• Shim patients well to prevent lateral movement of the body in situations when the patient must be turned on their side: - vomiting - 3rd trimester pregnancy - The board must be propped 45° on left side to prevent compression of the vena cava and thereby prevent compromised venous return to the heart. • Excessive padding under the head or shoulders will result in neck extension and too little padding results in neck flexion in peds patients. • A young child is defined as having the body size of less than an average 8-year-old. • Geriatric patients often require additional padding due to arthritic changes resulting in abnormal curvature of the spine.
♦ Secure the chest, hips and legs to the board with straps or binder ** ***Ensure chest expansion is not compromised and intra-abdominal pressure is not increased*** *** Ensure the patient can take full tidal volume breaths (chest expansion).***	• Securing the torso before securing the head prevents angulating the cervical spine. • Straps should be placed across chest in manner that does not compromise chest expansion and increase intra-abdominal pressure. Have patient inhale to check for adequate chest expansion. The patient must still be able to take a full tidal volume breath. You should be able to easily insert 1-2 fingers between the strap and the patient. • The straps should be placed over the shoulder girdle and pelvis and allow insertion of a finger between the chest and straps during full inspiration. • Restriction of chest movement and increasing intra-abdominal pressure may result in positional asphyxia. Pediatric patients are especially susceptible to this.
♦ Restrict the motion of head and neck by using an approved device ****Ensure that device does* not compromise patient's *airway, carotid arteries or neck veins***	• Head movement cannot be fully restricted by using only a strap or tape over the forehead. The sides of the head and neck must be stabilized with an <u>approved</u> head stabilization device, pads, rolled towels or blanket. **DO NOT use sandbags or IV bags.** • If a stoma is present, immobilize head and neck with an <u>approved</u> head immobilizer device. **DO NOT** apply a cervical collar. • Straps or 2-3" tape may be used to secure the head immobilizer device. Place strap or tape across the supraorbital ridge. • If tape is used, ensure that person removing the supraorbital tape understands that the tape should be cut between the eyebrows and pulled in the direction that the eyebrows grow (anterior to lateral ridge of orbit) to prevent denuding the hairs ☠ **DO NOT use chin cups or straps encircling the chin or tape the chin support of the collar. This is to prevent airway obstruction and will allow the patient to open the mouth if they need to vomit.** Continued… • Tape is used <u>only</u> across the cervical collar and immobilizing device to secure the immobilizing device. It is <u>never</u> applied across the collar alone to secure the neck to

	the board. (The motion restriction device disburses the pressure of the tape.)
Skill Component	**Key Concepts**
♦ Re-assess all extremities for: • Circulation/Pulse • Sensation • Motor movement } CSM	• The condition of the extremities must be initially assessed prior to moving the patient and then re-assessed when SMR has been completed. • Log rolling and securing the patient to the backboard may increase or result in injury to the spine. Additionally, straps may be too tight and compromise neuro and circulatory functions. • If a problem is noted, re-assess the patient and correct area of compromise. If no problem is identified, transport patient immediately
♦ Ensure the patient's arms are secured prior to rolling the patient to the ambulance – *as appropriate for the patient's condition:* - Conscious patients - Unconscious patients	• The patient's arms should be secured next to the patient's side or across the torso prior to moving the patient. • For **conscious** patients, their arms do not need to be secured for transport. For **unconscious** patients, their arms should be secured. However, in both cases, you should anticipate the treatment needs of the patients. Gaining IV access or reassessment vital signs may require leaving one (1) arm accessible. • The patient's arms should not be included in the hips or groin loops (if used). If these straps are tight enough to immobilize, they will compromise circulation.
♦ Lift the long spine board with the patient onto the gurney	
♦ Secures the spine board with the patient to the gurney	
♦ Roll the gurney to the ambulance	
♦ Un-secure the long spine board with the patient from the gurney prior to loading the patient into the ambulance.	
♦ Roll the patient off the long board prior to loading the patient into the ambulance, while maintaining SMR of the head and neck	• While a backboard may be used to assist with SMR during extrication, it is not required for SMR.

RE-ASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
§ Re-assess the patient at least every **5-15 minutes**: • Initial assessment • Relevant portion of the focused assessment • Evaluate response to treatment • Compare results to baseline condition and vital signs • Vital Signs: blood pressure, pulse, respirations • SpO2 • Pain scale	• The initial and focused examination is repeated every 15 minutes for stable patients and every five (5) minutes for unstable patients. • Every patient must be re-evaluated at least every five (5) minutes if any treatment was initiated or medication was administered. Re-assess the patient sooner if changes in the patient's condition are anticipated. • Unstable patients are patients who have abnormal vital signs, signs/symptoms of poor perfusion or if there is a suspicion that the patient's condition may deteriorate.

PATIENT REPORT AND DOCUMENTATION	
Skill Component	**Key Concepts**
§ Report and document neuro and circulatory findings of all four (4) extremities before and after spinal restriction.	• Documentation must be on either the Los Angeles County EMS Report or departmental Patient Care Record or ePCR.

Developed 3/01 Revised 11/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

NEUROLOGICAL EMERGENCY / SPINAL MOTION RESTRICTION (SMR)
LONG SPINE BOARD
Supplemental Information

INDICATIONS:

- For suspected injuries to the spine when a patient is found in a supine position.

CONTRAINDICATIONS FOR ATTEMPTING NEUTRAL IN-LINE POSITION OF THE HEAD:

- If head is grossly misaligned (no longer extends from midline)
- If moving the head into a neutral in-line position results in:
  - compromising airway or ventilation
  - initiating or increasing muscle spasms of the neck
  - increasing neck pain
  - initiating or increasing neurological deficits
  - encountering resistance when attempting to move the head of an unconscious patient

COMPLICATIONS:

- Hypoventilation
- Aspiration
- Asphyxia

COMMON MISTAKES:

- Inadequate SMR – leads to movement within the device if the device is not adequately secured.
- Lack of appropriate padding under occiput for adults and older children – results the head to be hyperextended.
- Lack of appropriate padding under shoulders and torso in toddlers and infants – results the head to be hyper-flexed.
- Failure to reassess patients for circulation, sensation, motor movement, airway compromise, and inadequate chest expansion – may result in increased neuro deficits or death.
- Taping or placing straps across the chin – may cause aspiration resulting in airway obstruction.
- Improper materials used for head SMR such as IV bags and sandbags – may cause further injury if the patient's position is shifted or is moved.
- Sizing cervical collars in place – may jostle the patient's head and neck resulting in additional discomfort or spinal compromise.
- Failing to remove the long spine board after the patient has been placed on the gurney.

NOTES:

- Occipital padding is required for adults and older children. Shoulder or torso padding is required for young children, toddlers, and infants.
- When log rolling, the patient's arms should be kept at the side to help splint the body. Placing the patient's arm above the head interferes with head and neck alignment.
- Tape should <u>never</u> be directly applied to chin or collar. Applying tape to these areas prevents aspiration and airway compromise
- Securing the torso before securing the head prevents angulating the cervical spine.
- Shim patients well to prevent lateral movement in situations when the patient must be turned on their side:
  - Vomiting
  - 3rd trimester pregnancy the board must be propped 45° toward the left side to prevent compression of the vena cava and thereby prevent compromised venous return to the heart.
- Only approved head/neck restriction devices such as commercial devices, towels, blanket rolls, etc. should be used. Sand bags, IV bags, and other heavy objects **SHOULD NEVER BE USED** as they may shift and result in further injury.

NEUROLOGICAL EMERGENCY / SPINAL MOTION RESTRICTION (SMR)
LONG SPINE BOARD
Supplemental Information

NOTES:

- Prolonged backboard restriction is frequently associated with headache, back pain, mandibular pain, and pressure sores. Symptoms develop at point of contact between a bony prominence and the board or cervical collar. Therefore, patients should be removed from the board once they have been placed on the ambulance gurney.
- Patients > 64 years of age **have a higher incident of spinal injury**. Therefore, the mechanism of injury should be taken into consideration when deciding if spinal motion restriction should be instituted.
- Excessive padding under the head or shoulders will result in neck extension and too little padding results in neck flexion.
- Secure the head and neck in or near the position it was initially found if:
  - Head is grossly misaligned (no longer extends from midline)
  - moving the head into a neutral in-line position results in:
    - compromising airway or ventilation
    - initiating or increasing muscle spasms of the neck
    - increasing neck pain
    - initiating or increasing neurological deficits
    - encountering resistance when attempting to move the head of an unconscious patient
- If patient requires positive pressure ventilation and only one (1) rescuer is available, the single rescuer can place the patient's head between the rescuer's thighs with his knees at the level of the patient's shoulders to maintain in-line stabilization.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

CIRCULATION EMERGENCY
EXTERNAL BLEEDING CONTROL / SHOCK MANAGEMENT

PERFORMANCE OBJECTIVES

Demonstrate proficiency in controlling external venous and/or arterial bleeding.

CONDITION

Assess and control external venous and/or arterial bleeding by appropriate methods. Necessary equipment will be adjacent to the manikin or brought to the field setting.

EQUIPMENT

Manikin or live model, bag-valve-mask device, O_2 connecting tubing, oxygen source with flow regulator, stethoscope, blood pressure cuff, pen light, timing device, 4"x4" dressings, various sizes of roller bandages, 6" absorbent gauze roll, 2 packs hemostatic dressings (HD), elastic wraps, commercial tourniquet, 2" non-elastic band and dowel, triangular bandage, tape, clipboard, pen, goggles, masks, gown, gloves.

PERFORMANCE CRITERIA

- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation (BSI) precautions	• Mandatory personal protective equipment – gloves at all times
♦ Assess scene safety/scene size-up ** ***Consider spinal injury precautions - <u>if indicated</u>***	• Spinal motion restriction should be initiated when spinal trauma is suspected by taking bystander information and mechanism of injury into consideration.
♦ Remove enough clothing to expose entire wound	
♦ Assess type of bleeding: • Arterial • Venous • Capillary	• <u>Arterial bleed</u> – bright red and gushing or spurting – *difficult to control* with *pressure, may need tourniquet* • <u>Venous bleed</u> – dark red and flows steadily – *controlled with direct pressure* • <u>Capillary blood</u> – dark or intermediate red and slowly oozing – *controlled easily with dressings*
♦ Evaluate the need for additional BSI	• Situational - long sleeves, goggles, masks, gown

PROCEDURE –BASIC BLEEDING CONTROL	
Skill Component	**Key Concepts**
♦ Attempt to manage bleeding by applying direct pressure to wound	• Direct pressure may involve using just the finger tips to control the bleed, or it may require hand pressure. • In the case of a blast injury, bypass other measures and go straight to tourniquet application. • Tourniquets (TQ) may be applied as soon as it is determined that the arterial or venous bleeding cannot be controlled with direct pressure.

Skill Component	Key Concepts
♦ Manage continued bleeding control by using any of these <u>additional</u> methods depending on injury: • Apply additional dressing – ***<u>if indicated</u>*** • Apply pressure dressing - ***<u>if indicated</u>*** • Splint extremity - ***<u>if indicated</u>***	• Continuing to reinforce dressing if bleeding does not stop **<u>may not stop the bleeding.</u>** **DO NOT** remove the original dressing since this may increase bleeding if the forming clot is torn away. However, the more dressings that are applied, the less likely bleeding will be controlled. Therefore, bulky dressings are contraindicated. • Splinting fractures will reduce tissue damage and bleeding associated with a fracture. • If bleeding is not controlled with the 1st tourniquet, apply a 2nd tourniquet proximal to the injury. DO NOT remove the 1st tourniquet.

TOURNIQUET APPLICATION

Skill Component	Key Concepts
♦ Manage uncontrollable bleeding by : • Apply a tourniquet 2-3 inches (just proximal to) above the hemorrhaging wound using: commercial device: a minimum of 1½ inches or (4cm) **OR** - inflated blood pressure cuff **OR** - 1½ - 2 inches (4-5cm) wide folded triangular bandage or non-elastic band and dowel ***DO NOT APPLY A TOURNIQUET OVER A JOINT*** ***<u>**In a multiple casualty situation, place the tourniquet "high and tight" on the limb as possible</u>***	• Blood loss reduces perfusion and oxygenation to the tissues. Therefore, administration of supplemental oxygen is necessary. However, never delay bleeding control while setting up oxygen. • When direct pressure has failed to stop the bleeding, a tourniquet should be used. • Tourniquets should not be placed over clothing in normal circumstances. • In an amputation, you must apply the tourniquet 2-3 inches above the amputation as the tourniquet is likely to slip off and could be ineffective. • For amputations and mangled extremities with minimal bleeding, tourniquet(s) should be applied since the initial vasospasm response that is decreasing the bleeding may cease over time and bleeding may start. • Tourniquets can either be a commercial product, 1½-2 inches, wide folded triangular bandage, or a non-elastic band and a dowel (rod). • Tourniquets **MAY <u>NOT</u> BE APPLIED** over a joint, but should be placed as close to the injury as possible. • Do not place a dressing over a tourniquet. Covering a tourniquet does not allow for monitoring for recurrent hemorrhage. • Tourniquets have been left on for 120-150 minutes without significant nerve damage or muscle injury. • In an awake patient, the application of a tourniquet causes pain. If ALS is on scene, pain should be managed. • If the ETA for the responding ALS ambulance exceeds the ETA to the closest trauma center (TC), transport the patient to the TC. • **The National Association of Emergency Medical Technicians has changed the language in the Prehospital Trauma Life Support, 9th edition, to state: "any "high and tight" tourniquet should, at the first opportunity, be moved to a position directly on the skin 2-3 inches above the wound.**
♦ Tighten the tourniquet until: • Distal pulse disappears **If bleeding fails to subside, apply a second tourniquet just proximal (side by side) or proximal to the first if bleeding does not subside	• **<u>It is very important to continue to tighten the tourniquet until the distal pulse disappears.</u>** As long as a distal pulse remains, the wound will continue to bleed. • Tissues remain saturated with oxygen for up to four (4) hours in the absence of a distal pulse. Therefore, the priority of care is to control the bleeding. • If a blood pressure cuff is used, check the pressure in the cuff frequently and re-inflate when needed to maintain consistent pressure. Blood pressure cuffs often leak air and thus may be ineffective. • Air splints and constricting bands do not provide enough pressure to control an arterial bleed.

	• Once a tourniquet is applied, it should NOT be loosened or removed without a physician's approval since this may disrupt the bleeding control that was obtained and cause the release of built-up toxins into the blood stream. • If bleeding is not controlled with the 1st tourniquet, apply a 2nd tourniquet proximal to the injury. DO NOT remove the 1st tourniquet. ***Note**: Caution must be taken to prevent potential damage to nerves, muscles, blood vessels, and soft tissue which may result in the loss of the extremity.*

PROCEDURE – BLEEDING CONTROL HEMOSTATIC DRESSINGS	
Skill Component	**Key Concepts**
♦ Verbalize the indications for the use of hemostatic dressings: • If bleeding is ***NOT*** controlled by tourniquet application • If a tourniquet is not indicated based upon the location of the injury:	• There are three (3) types of hemostatic dressings approved for use in California: ✓ QuickClot® Combat Gauze ✓ HemCon® ChitoFlex PRO Dressing ✓ Celox ™ Gauze • **<u>While ChitoFlex gauze contains shell fish, it does NOT contain a protein (antigen) that will interact with the patient and cause anaphylaxis.</u>** • Areas such as the chest, abdomen, arm pits, and groin are the most common areas where hemostatic dressings are applied. However, hemostatic dressing may be used on other bleeding sites where bleeding has been not been controlled by direct pressure or tourniquet use.
♦ Remove left-over pooled blood sitting in the wound while taking care to ***NOT*** remove blood clots that have formed in the wound	• Disruption of a blood clot in the wound causes additional bleeding to occur.
♦ Tear open the package and remove the dressing (Do not discard the package)	• Hemostatic dressings rapidly control bleeding much faster than other conventional methods for bleeding control. • Do not discard the package.
♦ Use fingers to pack the gauze firmly and tightly into the entire wound while maintaining pressure on the bleeding site	• Use as much gauze as needed to stop the bleeding. Large wounds may require the use of several packages. • Pack gauze firmly and tightly into the wound making sure to fill all wound space.
♦ Once the entire wound cavity is packed, place a stack of additional 4 X 4 gauze on top of the wound and wrap securely into place using a roller bandage *****Wrap the package onto the site using under the roller bandage.***	• Wrapping the empty package onto the site with the remaining gauze gives the product information to the receiving facility. It also provides the removal instructions on the back of the package. • If there is no additional gauze for wrapping, utilize any gauze roll or elastic bandage.
♦ Apply continuous pressure to the wound site for three (3) to five (5) minutes	• Applying continuous pressure and allowing extra time to ensure that adequate hemostasis has occurred may be beneficial.
♦ If the dressings become saturated with blood after three (3) minutes, remove the HDs and re-pack the wound	• Additional packages of HDs may be required if the bleeding does not stop after wound packing and continuous pressure. If the dressings are saturated with blood after three (3) minutes, this indicates that the HD did not come into direct contact with the source of bleeding. Therefore, the previous dressings must be removed and the wound must be re-packed.
♦ Elevate the wound above the heart – *if applicable*	• If the wound involves an extremity, elevate the wound above the level of the heart.
♦ Transport to the medical facility that best meets the needs of the patient	• Transport to the most appropriate medical facility that best meets the needs of the patient. (See LA county Reference No. 502, 510, and 506).

SHOCK MANAGEMENT

Skill Component	Key Concepts
♦ Institute shock management measures: • Administer high flow oxygen (12-15 Liters/minute) • Place patient in a supine position or as indicated for pregnancy > 20 weeks, difficulty breathing, vomiting, etc. • Initiate steps to prevent heat loss • Initiate immediate transportation if ALS is delayed	<u>Shock management:</u> • Hypothermia interferes with the clotting process. • Removing wet clothing and cover with blankets assist with maintaining body temperature • Immediate transport should be initiated if the ETA ALS provider is greater than 10 minutes • DO NOT administer oral fluids • Shock position is generally not effective and is no longer recommended in Los Angeles County. However, if utilized, it is accomplished by elevating the legs 6”-12” on a firm surface.

REASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
♦ Reassess the patient a every 5 minutes or sooner • Primary assessment • Relevant portion of the secondary assessment • Vital signs • Tourniquet - *<u>if applied</u>* • Hemostatic dressing use- *if utilized* *****Manage patient condition as indicated.***	• This is a priority patient who must be re-evaluated at least every 5 minutes. • Evaluating and comparing the results from a prior assessment assists with recognizing that the patient is improving, responding to treatment or condition is deteriorating. • The National Association of Emergency Medical Technicians has changed the language in the Prehospital Trauma Life Support, 9th edition, to state: “any “high and tight” tourniquet should, at the first opportunity, be moved to a position directly on the skin 2-3 inches above the wound.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Verbalize/Document: • Mechanism of injury • Description of injury • Treatment provided • Pulse/Circulation before and after treatment • Motor movement before and after treatment • Sensation before and after treatment • Time tourniquet was applied • Time the hemostatic dressing was applied • Name of the hemostatic dressing used	• The approved abbreviation for tourniquets is TQ. • Documentation must be on either the Los Angeles County EMS Report form, Provider Patient Care Record, or ePCR. • Documenting reassessment information provides a comprehensive picture of patient’s response to treatment. • Documenting the time of application of the tourniquet allows the physician to determine optimal treatment. • Last reassessment information (before patient care is transferred) should be documented in the section of the EMS form that is called “Reassessment after Therapies and/or Condition on Transfer.”

SPECIAL CIRCUMSTANCES

The use of hemostatic dressings and/or “wound packing” by EMS providers requires additional training and prior approval by the EMS Agency.

Developed 1/02 Revised 3/2018

CIRCULATION EMERGENCY
BLEEDING CONTROL
Supplemental Information

DEFINITION:

- Dowel - stick, rod, or any object that can be inserted under loop of the improvised tourniquet and used to twist tourniquet tight

TYPES OF BLEEDING:

- Blood loss from a pelvic fracture may be as much as 1500 mL, femur fracture 1000 – 1500 mL, from tibia and fibula 500 – 1000 mL, and humerus up to 750 mL.

Arterial

- Blood is bright red in color and oxygen rich.
- Arterial bleeding is the most difficult to control due to the pressure that is within the arteries.
- Blood spurts from the wound, but as the blood pressure drops, the spurting becomes less forceful.
- Intervention – direct pressure and/or a tourniquet.

Venous

- Blood is dark red in color and oxygen poor.
- Venous bleeding is easier to control than arterial bleeding due to lower venous pressure.
- Blood flows at a steady stream and may be minor or profuse depending on the size of the vessel.
- Intervention – may only require direct pressure and elevation, but if uncontrollable will require tourniquet.

Capillary

- Blood is dark red in color; site of oxygen and carbon dioxide gas exchange.
- Blood oozes from capillaries and usually clots spontaneously.
- Intervention –only requires a dressing.

TOURNIQUET FACTS:

- A tourniquet should be applied as soon as it is deemed necessary. Caution must be taken to prevent cutting into the skin and causing damage to underlying tissue**,** nerves, muscle, blood vessels, and soft tissue that could lead to loss of the extremity.
- Tighten the tourniquet until the pulse disappears.
- Narrow tourniquets only apply narrow pressure to blood vessels and are not as effective as wider tourniquets.
- Ensure tourniquet is tight against the skin and then tighten further using a windlass or ratchet.
- The larger the muscle, the tighter the tourniquet must be to be effective.
- DO NOT apply tourniquet over a joint.
- Avoid the use of tourniquets on a dialysis shunt – place the tourniquet proximal to the shunt and not on the shunt.
- If the initial tourniquet does not control bleeding or there is still a distal pulse:
  - tighten tourniquet
  - apply a 2nd tourniquet proximal to the 1st –
  - use as many tourniquets as needed to stem the bleeding or obliterate the pulse.
- The wider the tourniquet the more effective it is
- Apply tourniquet 2-3 inches or the width of hand above the injury
- Use a 1½- 2” wide band and secure tightly
- Once a tourniquet is applied, DO NOT or remove without physician approval
- Mark the time the tourniquet was applied (on the tourniquet).

INDICATIONS FOR TOURNIQUET USE:

- Uncontrolled extremity bleeding – unresponsive to direct pressure.
- Amputated or mangled extremity – initial vasospasm response may decrease with time and the injury may start to bleed.
- Isolate penetrating extremity trauma with shock – resuscitation efforts and administration of fluids may lead to bleeding

ADDITIONAL CONSIDERATIONS FOR TOURNIQUET USE

- Times when it is not possible to apply direct pressure
- When scene is unsafe and rapid extrication is needed
- When resources are overwhelmed

CIRCULATION EMERGENCY
BLEEDING CONTROL
Supplemental Information

TOURNIQUET APPLICATION USING A 2-4 INCH WIDE BAND AND DOWEL or TRIANGULAR BANDAGE

- Pad skin by wrapping 6-8 layers of a 4" bandage around the extremity twice.
- Place a 2-4"wide band loosely around extremity or triangular bandage and secure
- Make an over-hand knot, place dowel over knot then make a square knot over dowel
- Rotate the dowel (to tighten tourniquet) until the bleeding stops.
- Secure the dowel in position.
- Document the time the tourniquet was applied on the PCR and give a verbal when transferring care of the patient. The physician must know how long the tourniquet has been in place to determine priorities of care

COMMERCIAL TOURNIQUET APPLICATION

- Apply in accordance with manufacturer's directions.

INDICATIONS FOR THE USE OF HEMOSTATIC DRESSINGS

- Uncontrolled Bleeding by the use of tourniquet
- Uncontrolled bleeding from locations that cannot accommodate the use of a tourniquet

HEMOSTATIC DRESSING FACTS

- Hemostatic dressings may remain in place for up to 24 hours
- Wrapping the dressing package around the wound provides the appropriate information about the product used and how to remove the product.
- The dressing must be packed into the wound tightly and firmly until the bleeding stops. The remainder of the dressing is placed on top of and around the wound.
- Large wounds may use several packages of hemostatic dressings.
- If bleeding is not stopped by HD and three (3) minutes of pressure, the dressing(s) must be removed and replaced. Saturated dressings indicate that the HD did not come into direct contact with the source of bleeding.

NOTES – GENERAL BLEEDING CONTROL:

- Direct pressure may involve using the finger tips, hands, or pressure dressings.
- ChitoFlex PRO dressing contains shell fish. Therefore, it should not be used if the patient is allergic to shell fish.
- Elevation of an extremity may be used secondary to and in conjunction with direct pressure.
- Continue to reinforce dressing if bleeding does not stop. However, avoid excessive and bulky dressings. The more dressings applied, the less likely you are to control the bleeding. DO NOT remove original dressing since this may increase bleeding if clot formation has started.
- If bleeding is not controlled with the 1st tourniquet, apply a 2nd tourniquet proximal to the injury. DO NOT remove the 1st tourniquet.
- Pressure points for bleeding control have not proven to be effective and only delay bleeding control.
- Splinting fractures will reduce tissue damage and bleeding associated with a fracture.
- Pneumatic pressure devices include air splints, blood pressure cuff, and the pneumatic antishock garment (PASG). Air splints do not have enough pressure to control an arterial bleed. Blood pressure cuffs often leak air and thus may be ineffective.
- For major bleeding around an impaled object, apply direct pressure on both sides. Do NOT remove or put pressure on the object.
- EMS providers must receive additional training and approval from the EMS Agency to utilize hemostatic dressings.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

SOFT TISSUE INJURY / BANDAGING
ABDOMINAL EVISCERATION

PERFORMANCE OBJECTIVES
Demonstrate competency in applying a dressing to an open abdominal injury with an evisceration of the intestines.

CONDITION
Assess and apply an occlusive dressing to an abdominal injury with an evisceration of the intestines. Necessary equipment will be adjacent to the patient or brought to the field setting.

EQUIPMENT
Manikin or live model, bag-valve-mask device, O_2 connecting tubing, oxygen source with flow regulator, 4"x4" dressings, large multi-trauma dressings, clear plastic wrap, tape, goggles, masks, gown, gloves.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.

Skill Component	Key Concepts
♦ Establish body substance isolation precautions	• Mandatory (minimal) personal protective equipment – gloves
♦ Assess scene safety/scene size-up ** ***Consider spinal motion restriction (SMR) - if indicated***	• SMR should be initiated when spinal trauma is suspected • This information may be obtained from bystanders and by taking the mechanism of injury into consideration.
♦ Evaluate ~~the~~ need for additional BSI precautions	• Situational - goggles, mask, gown
♦ Expose the entire wound	• To expose the wound, cut away the clothing. **DO NOT** touch or attempt to replace any protruding organs
♦ Administer oxygen, per Los Angeles County Reference No. 1304	• The goal of oxygen administration is to deliver the minimum amount of oxygen to meet the needs of the patient, and to maintain a SpO_2 at 94-98%%.

PROCEDURE

Skill Component	Key Concepts
♦ Saturate a large sterile dressing with sterile normal saline (NS)	• **DO NOT** use water (sterile or tap) to saturate dressings. Use only NS for dressings.
♦ Place several (2-3 layers) sterile NS saturated dressings over wound ** ***Ensure all exposed organs are covered***	• **DO NOT** attempt to replace eviscerated organs • Using a saturated NS dressing prevents organ dehydration. *Dry dressings adhere to and dry out saturated tissues resulting in further destruction and necrosis of abdominal organs/tissues.* • **DO NOT** use petroleum gauze, adhering material, or any material that may lose substance when wet.

Skill Component	Key Concepts
♦ Apply an occlusive dressing over the saturated dressings and tape on all four (4) sides ** ***Prepare for rapid transport***	• Occlusive dressings consist of plastic wrap or sheeting or additional dry dressings over the saturated dressings. DO NOT use aluminum foil, this may cause laceration of the eviscerated organ. • Organ dehydration and heat loss occurs rapidly with an open abdominal cavity. • DO NOT delay transport to apply an occlusive dressing over the saturated dressings. • Secure dressings by taping around all four (4) sides the dressing or tying cravats above and below the position of the exposed eviscerated organ

Skill Component	Key Concepts
♦ Cover the patient with a blanket to maintain their body heat	• Heat loss occurs rapidly with an open abdominal cavity.
♦ Transport patient supine with hips and knees flexed – *unless contraindicated*	• Flexing the patient's hips and knees decreases tension on the abdomen. • Placing a pillow or other padding under the knees assists with keeping the knees flexed.
§ Explain the care being delivered and transport destination to the patient/caregiver	• Communication is important when dealing with the patient, family, or caregiver. This is a very critical and frightening time for all involved and providing information helps in decreasing the stress they are experiencing.

REASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
♦ Repeat assessment at least every **5 minutes or sooner for unstable** patients and every **15 minutes for stable** patients. • Primary assessment • Relevant portion of the secondary assessment • Vital signs: BP, Pulse, Respirations ***** Evaluate response to treatment***	• An unstable patient is one who has abnormal vital signs, S/S of poor perfusion or if you suspect the patient's condition to deteriorate. • Patients must be re-evaluated at least every five (5) minutes or sooner if any treatment was initiated, medication administered or a change in the patient's condition occurs or is anticipated
§ Continue O_2 therapy, if indicated, until the transfer of patient care has occurred	• Once oxygen therapy has been initiated, it should **NOT BE** discontinued until the transfer of patient care has occurred.
♦ Evaluate results of reassessment and note any changes from patient's previous condition and vital signs *****Manage patient condition as indicated.***	• Evaluating and comparing results assists with recognizing if the patient is improving, responding to treatment, or if their condition is deteriorating.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Verbalize/Document: • Mechanism of injury • Description of injury • Treatment rendered	• Documentation must be on either the Los Angeles County EMS Report, ePCR, or departmental Patient Care Record form. • Documenting reassessment information provides a comprehensive picture of patient's response to treatment. •

Developed: 1/02 Revised: 10/1/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

SOFT TISSUE INJURY / BANDAGING

ABDOMINAL EVISCERATION

Supplemental Information

NOTES:

- An abdominal evisceration is an opening on the abdominal wall where a section of intestines or other abdominal organs/tissue that protrudes.
- DO NOT use water (sterile or tap) to saturate dressings. Use only normal saline for dressings.
  - Water is a hypotonic solution, which causes cells to burst. Water moves into the cells and when the cell volume exceeds the cell capacity they will rupture.
- Keep eviscerated organs saturated and warm since organ dehydration and heat loss occurs rapidly with an open abdominal cavity.
- DO NOT use petroleum gauze, or any other adherent material on the exposed organs
- An occlusive dressing consists of plastic wrap or sheeting.
- Secure dressings by taping around all four (4) sides. If the patient is allergic to tape, ~~or tying~~ cravats may be used to secure the dressings, above and below the position of the exposed eviscerated organs.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

SOFT TISSUE INJURY / BANDAGING
PENETRATING CHEST INJURIES

PERFORMANCE OBJECTIVES
Demonstrate competency in applying a dressing to an open chest wall injury. (No through and through injury to the back)

CONDITION
Assess and apply a vented chest seal OR a three (3) sided occlusive dressing to an open chest wall injury. Necessary equipment will be adjacent to the patient or brought to the field setting.

EQUIPMENT
Manikin or live model, bag-mask-ventilation device, O_2 connecting tubing, oxygen source with flow regulator, vented chest seal, petroleum gauze dressings, 4 X 4 gauze squares, 2 inch tape, clear plastic wrap, foil, goggles, masks, gown, gloves.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions	• Mandatory (minimal) personal protective equipment – gloves
♦ Assess for scene safety/scene size-up ***Consider spinal motion restriction (SMR) - if indicated***	• SMR should be initiated when spinal trauma is suspected by taking bystander information and mechanism of injury into consideration.
♦ Evaluate the need for additional BSI precautions	• Situational - goggles, mask, gown
♦ Places the patient on oxygen at 15L/min via non-rebreather ***Monitor the oxygen saturation level – if able*** ***Provide positive pressure ventilation – if indicated***	• All patients with a suspected pneumothorax get high flow oxygen. • If available, use pulse oximetry to guide oxygen delivery. The desired SpO_2 for most non-critical patients is 94-98% **SPECIAL CONSIDERATION:** For patients with chronic obstructive pulmonary disease (COPD), the goal is to titrate oxygen to keep the SpO_2 at 88-92%. • SpO_2 reading must always be documented on the EMS Report or ePCR. • The indications for positive pressure ventilation are: ○ Apnea/Respiratory Arrest ○ Cardiopulmonary Resuscitation ○ Respiratory Failure: shortness of breath, tachypnea, air hunger (feeling like you cannot breathe, cyanosis, ALOC, drowsiness ○ Stridor ○ Gasping
♦ Remove enough clothing to expose the entire chest and back and look for wounds	• Penetrating wounds to the chest may cause an open pneumothorax. • The patient's back must also be assessed for the presence of through and through wounds.

Skill Component	Key Concepts
♦ Verbalizes the signs and symptoms of a tension pneumothorax: • Apprehension • Pain aggravated by breathing • Bruising • Dyspnea • Absent lung sounds on the affected side • Tachycardia • Hypotension • Tracheal deviation • Subcutaneous emphysema • Decreased level of consciousness	• A tension pneumothorax is a life-threatening emergency. Air continues to enter the pleural space and the intrathoracic pressure increases. The lung on the affected side collapses as the pressure continues to build up. The structures in the mediastinum are displaced to the other side of the chest. Ultimately, this affects venous return to the heart and leads to a decreased cardiac output and obstructive shock. • Tracheal deviation is a late finding and rarely seen in the prehospital setting. • Distended neck veins may not be present in cases where the patient as lost a significant amount of blood. • The presence of subcutaneous emphysema is a common finding. Air escapes through the chest wall into the tissues surrounding the injury. A crackling sensation is felt when the skin around the injury is palpated. • A common finding is decreased lung sounds on the affected side ***NAEMT, Prehospital Trauma Life Support, Eight edition, page 344-345***

PROCEDURE

Skill Component	Key Concepts
♦ Place your gloved hand and gauze over the penetrating wound	• Placing a gloved hand over the penetrating wound provides a temporary seal.
♦ Wipe away any excess blood around the chest wound	• Consider the use additional BSI measures - if warranted.
♦ Peel the backing off of the vented chest seal ***** Place the chest seal directly over the wound. (Wound should be in the center of the vented chest seal)***	• Air leaks may be minimized by placing the wound under the center of the chest seal.
♦ Apply a vented chest seal over the chest wound	• The initial management of a penetrating chest injury includes sealing the chest defect. • The wound should be in the center of the vented chest seal.
♦ Apply an occlusive dressing to a penetrating chest would if a vented chest seal is not available: ***** Seal the chest wound with an occlusive dressing and secure the dressing on three (3) sides.***	• There is no evidence to support whether sealing the dressing on three (3) sides is better than sealing all four (4) sides.
♦ Remove the occlusive dressing if: • The patient status deteriorates • There are signs and symptoms of a tension pneumothorax ***** Transport the patient by ALS***	• Removal of the occlusive dressing should allow the tension pneumothorax to decompress through the wound. • The definitive treatment for a tension pneumothorax includes needle decompression of the chest which can only be performed by ALS providers.

RE-ASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
§ Re-assess the patient every five (**5) minutes or sooner for** unstable patients and every **15 minutes for stable** patients. • Primary assessment • Relevant portion of the secondary assessment • Vital signs: Blood pressure, pulse and respirations • Lung sounds • SpO_2 • Pain scale *****Manage patient condition as indicated.***	• A patient with an open chest wound is an unstable patient as they may have abnormal vital signs, S/S of poor perfusion, and their condition may deteriorate rapidly. • Patients must be re-evaluated at least every five (5) minutes or sooner if any treatment was initiated, medication administered, or if a change in the patient's condition is anticipated. • Evaluating and comparing results assists in recognizing if the patient is improving, responding to treatment, or if their condition is deteriorating.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Verbalize/Document: • Mechanism of injury • Description of injury • Treatment rendered	• Documentation must be on the Los Angeles County EMS Report form, departmental ePCR, or Patient Care Record form. • Documenting re-assessment information provides a comprehensive picture of patient's response to treatment.

Developed: 11/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

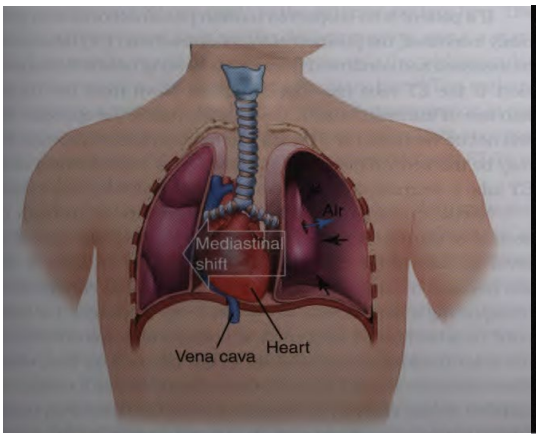
SOFT TISSUE INJURY / BANDAGING
PENETRATING CHEST INJURY
Supplemental Information

SIGNS & SYMPTOMS OF A TENSION PNEUMOTHORAX:

- Apprehension
- Chest discomfort
- Absent lung sounds on the affected side
- Tachypnea
- Tachycardia
- Juglar venous distension (JVD)
- Tracheal Deviation
- Subcutaneous emphysema
- Hypotension
- Decreased level of consciousness

NOTES:

- Penetrating injuries to the chest creates a hole in the chest wall thereby allowing air to flow into and out of the pleural space.
- As more and more air is drawn into the pleural space, the lung begins to collapse and there is decreased ventilation.
- Pneumothorax is present in 20% of severe chest injuries and it is a life threatening event.
- The management of a penetrating chest injury is aimed at early recognition of providing ventilatory support and preventing a simple pneumothorax from developing into a tension pneumothorax.
- Communication with the patient, family, or care giver is important. Explain all care being rendered.
- Occlusive dressings consist of a chest shield, plastic wrap, foil, or sheeting.



NAEMT, Prehospital Trauma Life Support, Eight edition, pages 344-345

COMPONENTS OF A TRAUMA BAG:		
Adhesive dressings (Band-Aid®	**Dressings – Trauma, 4X4, Vaseline**	**Gauze bandages**
Trauma shears	**Splints – long, short, and traction**	**Extrication device**
Commercial chest seals	**Tape – assorted sizes**	**Head immobilizer device**
Tourniquets	**Occlusive dressing / Vaseline gauze**	**C-collars**
Hemostatic dressings	**Normal saline irrigation**	**Flashlight**
PPE: gloves/gown/goggles	**Burn pack or burn sheet**	

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

MUSCULOSKELETAL INJURY / SPLINTS
LONG BONE & JOINT INJURIES

PERFORMANCE OBJECTIVES
Demonstrate competency in immobilizing a long bone and joint dislocation.

CONDITION
Apply a splint on a patient who has sustained an isolated extremity fracture, and/or a joint dislocation. Necessary equipment will be adjacent to the manikin or brought to the field setting.

EQUIPMENT
Adult CPR/trauma manikin or live model, various rigid and conforming splints, long spine board, all necessary straps, sterile dressings, 2"-3"roller gauze, 1" tape, goggles, masks, gown, gloves.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Take body substance isolation precautions	• Mandatory personal protective equipment - gloves
♦ Assess scene safety	
♦ Evaluate additional BSI needs	• Situational - long sleeves, goggles, masks, gown
♦ Determine if patient sustained possible spinal injury ** ***Institute spinal motion restriction (SMR) - if indicated***	• If SMR is warranted, institute SMR. This may be determined by environment, mechanism of injury and information obtained from witnesses and the patient.
♦ Stabilize and expose the injured extremity: • Cut clothes away - *if indicated* • Remove shoes and socks - *if indicated* • Remove extremity and toe/finger jewelry	• Shoes must be removed to assess for pulse and sensation. • Some extremities may be readily exposed and do not require that clothes are cut. • Jewelry must be removed prior to swelling of extremity or digits and therefore not compromise circulation.
♦ Assess extremity distal to injury for: • Circulation/Pulse • Sensation • Motor movement } CSM ** ***Consider realignment of extremity - if signs and symptoms of neurovascular compromise*** Signs and symptoms of neurovascular compromise include: - Pulseless - Cyanotic - Pallor - Mottling - Swelling ** ***Cover wound(s) with sterile dressings and secure them in place – if indicated***	• Pulse/Circulation - palpate pulses distal to injury and mark with an "X." Check for pulse characteristics, color, temperature, capillary refill. • Sensation - determine numbness or tingling and sensitivity to touch. • Motor movement - have patient wiggle fingers or toes. • If extremity resistant to realignment - splint in position found. • Signs and symptoms of neurovascular compromise include: - Pulseless - Cyanotic - Pallor - Mottling - Swelling • The presence of a wound over a potential fracture site should be treated as an open fracture until proven otherwise. Therefore, it is important to over the wound(s) with a sterile dressing and secure it into place with two (2) inch tape.

Skill Component	Key Concepts
♦ Determine if a splint should be applied ** ***Consider rapid transport - <u>if patient is critical</u>***	• Splinting is never a priority if the patient is critical. For critical patients, rapid transport is the priority. • Splinting minimizes pain, reduces hemorrhage and the risk of a closed fracture converted to an open fracture, blood vessel and nerve damage, and fat emboli.
♦ Select the proper splint for stabilization and immobilization	• The splint selected should achieve the goal of stabilization and immobilization of the joint above and below the fracture site.
♦ Prepare and pad the splint - *<u>as needed</u>*	• The splint should be measured, cut, or bent prior to being placed on the patient to avoid jostling the injured extremity. • When immobilizing the lower leg, cut or mold splinting material or 10"-12" longer than the desired length to allow for forming the splint at a perpendicular angle to support the foot.

PROCEDURE – LONG BONE INJURIES

Skill Component	Key Concepts
♦ Support the fracture site and maintain manual immobilization: ** ***Insert a 2"-3" wide roller bandage into patient's cupped palm - <u>if indicated</u>***	• Supporting the injured extremity as best as possible aids in minimizing pain and further injury.
♦ Lift the extremity	• Avoid excess movement of the injured extremity by gently lifting the joint just enough to slide the splint under the injured joint.
♦ Slide the splint under the extremity	• Use extreme care while sliding the conforming splint into place. • The slightest movement may cause excruciating pain for the patient..
♦ Lower the affected extremity into the splint	
♦ Secure the splint: • <u>Bone</u> - immobilize the joint above and below the fracture site • Make sure extremity is properly shimmed ** ***Consider elevating the of the extremity slightly above the level of the heart*** ** ***Apply an ice pack to the injury site*** ** ***Secure the splint into place by using the appropriate material***	• Immobilizing the joint above and below the site ensures stabilization of the fracture or injury. • Shimming involves padding the extremity in the splint to decrease any movement of the extremity. Make sure there is even pressure and contact. Pad all bony prominences. • For extremity fractures, the extremity should be elevated about 6" to minimize swelling. • Always apply a layer of protection between an ice pack and the skin to reduce the possibility of frostbite or further injury to underlying tissue. • Securing the splint helps to minimize shifting of the splinting material, which could compromise CSM.
♦ Re-assess distal extremity for CSM: • Circulation/Pulse • Sensation • Motor movement } CSM	• A pulse should be palpable indicating circulation to the extremity. • The patient should be able to move fingers/toes • The patient should not be complaining of paresthesias.
♦ If CSM is compromised: ** ***Un-secure and then re-secure the rigid splint*** ** ***If CSM is not restored, <u>remove the splint</u> and maintain manual stabilization of the extremity*** ** ***Immediately transport the patient***	• If the CSM appears compromised, un-secure and then re-secure the splint while re-assessing the extremity. • If CSM is not restored, do not delay transport to the most accessible receiving facility.

PROCEDURE – JOINT INJURIES

Skill Component	Key Concepts
♦ Support the injured joint and maintain manual immobilization: ** ***Insert a 2"-3" wide roller bandage into patient's cupped palm - <u>if indicated</u>***	• Consider the use of a sling and swathe for a shoulder injury.
♦ Lift the extremity	• Avoid excess movement of the injured joint by gently lifting the joint just enough to slide the splint under the injured joint.
♦ Slide the splint under the extremity	• Use extreme care while sliding the conforming splint into place. • The slightest movement may cause excruciating pain for the patient.
♦ Lower the affected joint into the splint while supporting the joint	• Supporting the injured extremity as best as possible aids in minimizing pain and further injury.
♦ Secure the splint: • <u>Joint</u> - immobilize the bones above and below the injured joint • Make sure extremity is properly shimmed ** ***Consider elevating the extremity slightly above the level of the heart*** ** ***Apply an ice pack to the injury site*** ** ***Secure the splint into place by using the appropriate***	• Immobilizing the bone above and below the site ensures stabilization of the injured joint. • Shimming involves padding the extremity in the splint to decrease any movement of the extremity. Make sure there is even pressure and contact. Pad all bony prominences. • For lower extremity fractures, patient should be supine and the extremity elevated about 6" to minimize swelling. • Applying a layer of protection between an ice pack and the skin reduces the possibility of frostbite or further injury to underlying tissue. • When securing the splint, avoid covering areas where pulse checks would occur. • Securing the splint helps to minimize shifting of the splinting material, which could compromise CSM.
♦ Re-assess distal extremity for CSM • Circulation/Pulse • Sensation • Motor movement } CSM	• A pulse should be palpable indicating circulation to the extremity. • The patient should be able to move fingers/toes • The patient should not be complaining of paresthesias.
♦ If CSM is compromised: ** ***Un-secure and then re-secure the splint*** ** ***If CSM is not restored, <u>remove the splint</u> and maintain manual stabilization of the extremity*** ** ***Immediately transport the patient***	• If the CSM appears compromised, un-secure and then re-secure the splint while re-assessing the extremity. • If CSM is not restored, do not delay transport to the most accessible receiving facility.

REASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
§ Repeat an ongoing assessment every **5-15 minutes**: • Initial assessment • Relevant portion of the focused assessment • Evaluate response to treatment • Compare results to baseline condition and vital signs ****Manage patient's condition as indicated***	• The primary/initial and secondary/focused examination is repeated every 15 minutes for stable patients and every 5 minutes for priority patients. • Every patient must be re-evaluated at least every 5 minutes, if any treatment was initiated or medication administered, unless changes in the patient's condition are anticipated sooner. • Priority patients are patients who have abnormal vital signs, signs/symptoms of poor perfusion or if there is a suspicion that the patient's condition may deteriorate.

PATIENT REPORT AND DOCUMENTATION	
Skill Component	**Key Concepts**
§ Verbalize/Document • Mechanism of injury • Description of injury • Treatment provided • Type of splint • Pulse/Circulation before and after splinting • Motor movement before and after splinting • Sensation before and after splinting	• Documentation must be on either the Los Angeles County EMS Report or departmental Patient Care Record form or ePCR.

Developed 11/01 Revised 10/2017

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

Supplemental Information
MUSCULOSKELETAL INJURY / SPLINTS
LONG BONE & JOINT INJURIES

INDICATIONS:

- Protect and maintain the position of an injured extremity:
  - fracture
  - sprain/strain
  - dislocation

COMPLICATIONS:

- Neurovascular compromise if splint is applied incorrectly.

SPLINTING PRINCIPLES:

- **Priorities in managing a patient with an extremity injury:**
  - 1st - life-threatening conditions
  - 2nd - limb-threatening conditions
  - 3rd - all other conditions
- **General management for suspected long bone fractures/joint dislocations:**
  - Stop bleeding and treat for shock
  - Support area of injury
  - For a long bone injury, immobilize joints above and below injury site
  - For a joint injury, immobilize the bones above and below the injury site
- **General splinting principles:**
  - Pad splints to adjust for anatomic shapes and patient comfort
  - Remove jewelry to prevent neurovascular compromise with increased swelling
  - Evaluate extremity before and after immobilization for nerve and vascular function

SPLINTING ERRORS:

1. Splinting before life-threatening injuries are addressed. *(Treat life-threatening injuries first, then splint.)*
2. Delaying transport of critical patients in order to splint an extremity.
3. Improper splinting technique:
   - Splints applied too tight will compromise circulation and can cause nerve and muscle damage.
   - Splints applied too loosely may result in further soft-tissue damage or convert a closed fracture into an open fracture.

- Applying an incorrect splinting device that is inappropriate for the severity of the patient's condition and method of transport.
- Not realigning long bones when an extremity is pulseless and cyanotic.

NOTES:

- Attempting to realign joints may lead to damage of soft tissues, nerves, and muscles.
- Splints include board splints (wood, plastic, or metal), air splints, traction splints, pre-formed specific area splints, and spine board (long board). Moldable splints include cardboard splints, SAM splints, vacuum splints, malleable metal finger splints, and blanket rolls, and pillows. Almost anything can be made into a splint if you are creative enough.
- There are two (2) situations when an extremity must be splinted in the position found- if possible:
  1. Dislocations – **DO NOT ATTEMPT TO REDUCE A DISLOCATION IN THE FIELD.**
  2. If resistance or extreme pain is encountered during a realignment attempt, stop and immobilize the extremity lies and transport the patient to the most accessible receiving facility.
- Splinting minimizes pain, reduces hemorrhage, and the risk of converting a closed fracture into an open fracture, and prevents blood vessel and nerve damage, and fat emboli.
- Immobilizing the joint above and below the fracture site ensures stabilization of the fracture.
- Shimming involves padding the extremity in the splint to decrease any movement of the extremity. Make sure there is even pressure and contact. Pad all bony prominences.
- For lower extremity fractures, patient should be supine and the extremity elevated about 6" to minimize swelling.
- Always apply a layer of protection between an ice pack and the skin to reduce the possibility of frostbite or further injury to underlying tissue.
- Always splint the hand in the position of function. DO NOT tape fingers flat or cause angulation of the wrist.
- Long bone and joint injuries are very painful. Therefore, pain management is indicated. Only ALS has the ability to administer pain medication. However, the application of ice and splinting assists with managing the patient's pain.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

MUSCULOSKELETAL INJURY
TRACTION SPLINTING

PERFORMANCE OBJECTIVES
Demonstrate competency in applying a minimum of two (2) types of traction splints.

CONDITION
Apply a traction splint on a patient who has sustained an isolated mid-shaft femur fracture. There are no contraindications. The necessary equipment will be adjacent to the patient or brought to the field setting. There is an assistant.

EQUIPMENT
Adult CPR/trauma manikin or live model, assistant, two (2) traction splints, long spine board, all necessary straps, sterile dressings, 2" tape, goggles, masks, gown, gloves.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions	• Mandatory personal protective equipment - gloves
♦ Assess scene safety	
♦ Evaluate for additional BSI needs	• Situational - goggles, masks, gown
♦ Institute spinal motion restriction (SMR) - <u>if indicated</u>	• If unknown of possible If a spinal injury is suspected, institute spinal immobilization motion restriction (determined by environment and information obtained from bystanders).
♦ Direct assistant to stabilize the affected lower extremity	• Application of the bipolar traction splint requires two (2) rescuers: - Rescuer #1 to apply the splint - Rescuer #2 to stabilize the extremity, apply and maintain manual traction.
♦ Expose the injured extremity: • Cut the clothes away - <u>*if indicated*</u> • Remove the shoes and socks • Remove all jewelry from the injured extremity	• Femur fractures result from major force and in children is commonly the result of child abuse. • The lower extremity is generally shortened, externally rotated with possible mid-thigh swelling due to hemorrhage. • Shoes must be removed to assess for pulse and sensation and prevent interference with the stability of the ankle harness. • Jewelry must be removed prior to swelling of the foot to avoid compromised circulation. • Fractures of the tibia/fibula generally do not require traction splints
§ Explain the care being delivered and the transport destination to the patient/caregivers	• Communication is extremely important when dealing with the patient, family, or caregiver. Providing an explanation of the care improves the patient's trust and compliance.

Skill Component	Key Concepts
♦ Assess the distal extremities for: • Circulation/**P**ulse • Sensation • Motor movement } CSM	• Pulse - palpate the posterior tibialis or pedal pulse and mark the location of the pulse with an "X." • Circulation - check for color, temperature, and capillary refill. • Motor movement - have the patient move his/her toes. • Sensation –determine if numbness, ~~or~~ tingling, and sensitivity to touch of the lower extremity exists, including the toes.
♦ Cover any open wound(s) with a sterile dressing and secures it in place - *if indicated*	• Blood loss from femoral fractures may exceed 500-1000 ml. This may be doubled if it is an open fracture.
♦ Determine if a traction splint should be applied ** ***Consider rapid transport - if patient is critical***	• If the patient is critical, splinting should be limited to securing the fractured limb to a long spine board and rapid transport. • Splinting decreases pain, hemorrhage, the risk of converting a closed fracture to an open fracture, blood vessel and nerve damage, and fat emboli.

BIPOLAR TRACTION SPLINT PROCEDURE (HARE) PROCEDURE

Skill Component	Key Concepts
♦ Apply the ankle harness above the ankle and adjust harness to ensure a snug fit	• Application of the Hare splint requires two (2) rescuers: - Rescuer #1 to apply the splint - Rescuer #2 to stabilize the extremity, apply and maintain manual traction. • Depending on patient's condition, traction may need to be applied first before the splint is ready. It takes several minutes for spasm and pain to ease after traction is applied. Therefore, traction is recommended as soon as possible. • It is easier, faster, and provides more stability if the harness is put in place prior to applying traction. This prevents having to work around hands that are holding traction. • The bottom edge of the side flaps of the harness should be about 1" above the lateral protrusions of the ankle. • Make sure that side flaps do not cross over the top of the foot, but at the ankle so that traction will be pulled against the ankle and not the top of the foot.
♦ Direct the assistant to initiate and maintain manual traction: • Hold the harness (ring strap) in one hand • Place the other hand under the extremity and above the harness • Slowly pull the extremity until the pain is reduced and/or circulation improves	• The amount of traction applied should be enough to reduce pain and/or improve circulation, if compromised. • Manual traction must be maintained until the splint has been applied. • The assistant should position himself or herself without interfering with sliding the splint in place. • The assistant should keep his or her arms straight and lean backward using the weight of the upper torso maintaining consistent traction. • The fracture site must be supported consistently throughout procedure. • DO NOT put fingers in D-rings. Fingers may get stuck as extremity is moved.
♦ Unlock the collet sleeves	
♦ Measure the splint for length: • Place against lateral aspect of the uninjured extremity • Extend splint approximately 8"-12" beyond the patient's heel	• The uninjured extremity is used to measure the splint. Using the injured extremity would give an inaccurate splint measurement due to shortening and external rotation of the extremity. • It is better to go with extra splint length then having it be too short. If splint is too short, the appropriate amount of traction cannot be applied.

Skill Component	Key Concepts
♦ Relock the collet sleeves	• It is important to ensure the splint does not shorten when traction is applied. This may lead to increased bleeding, muscle, nerve, and vascular damage.
♦ Fold down the heel stand and lock it in place	
♦ Place the splint next to the injured lower extremity and prepare support straps: • 1st above fracture site • 2nd above knee • 3rd below knee • 4th above ankle	• Straps may be placed over the fracture site, but not over the knee.
♦ Support the fracture site under the thigh by using one (1) hand	
♦ Direct the assistant to lift the extremity while maintaining manual traction • Slowly elevate the foot 10”-12" off the ground for stable alignment. ***** Ensure the fracture site is supported***	• The foot should be elevated approximately 10”-12" off the ground for splint placement. • Both rescuers must lift the extremity at the same time. If the extremity is not kept in alignment, the movement will increase pain and possibly additional injury.
♦ Slide the splint under the affected extremity until it seats against the ischial tuberosity	• Make sure that the half ring is seated well against the ischial tuberosity.
♦ Direct the assistant to lower the extremity onto the splint while maintaining manual traction ***** Ensure that the fracture site is supported***	• Both rescuers must lower the extremity at the same time. If the extremity is not kept in alignment, the movement will increase pain and possibly additional injury.
♦ Pad the groin area as needed	• Use a trauma dressing or equivalent for padding. • Make sure pressure is **NOT** directly applied to the external genitalia or bony areas.
♦ Secure the groin strap high around the upper thigh of the injured extremity	
♦ Hook the D-ring(s) into the “S” hook	
♦ Adjust the traction by turning the winch until manual traction has been equaled	• You know that adequate traction is achieved when the patient feels some relief.
♦ Direct assistant to slowly release manual traction	
♦ Secure the 4 support straps: • 1st above fracture site • 2nd above knee • 3rd below knee • 4th above ankle	• Straps must not be secured before traction has been established: - may interfere with pulling traction along the entire length of the extremity - may cause angulation and excessive tightening of the strap resulting in compromised circulation
♦ Secure the patient and splint to the backboard	• Securing the patient and splint to the backboard, for ease of movement and transport, will stabilize the hip joint and prevent movement of the splint during transport. • The kick stand must be secured with 2” cloth tape to prevent collapse and additional pain and injury to the patient. • Move the patient on a backboard toward the top of the gurney if there is a concern that the door will not shut. • To minimize pain and swelling, apply an ice pack.
♦ Re-assess extremity distal to injury for: • Circulation/Pulse • Sensation • Motor movement/function } CSM	

UNIPOLAR TRACTION SPLINT PROCEDURE (SAGER)	
Skill Component	**Key Concepts**
♦ Place the Sager splint on ground with the top of the padded "T-bar" in-line with the patient's groin	• The Sager provides counter-traction against the pubic bone and the ischial tuberosity (sitting bone) of the pelvis. ***A common application mistake that is made is that the bar is placed too high into the groin area and not seated against the pubic bone and the ischial tuberosity.*** • The "T-bar" fits like a bicycle seat. • The Sager allows for splinting of both lower extremities with one (1) device, if needed. However, there must be a provision for two (2) ankle harnesses. The groin strap will allow for traction of both lower extremities.
♦ Measure the splint for length: • Place against the medial aspect of the injured or uninjured lower extremity • Extend the pole to the level of the heel	• Either the splint may have a pulley wheel, a perpendicular "L," or a cross bar for bilateral splinting. • The spring, within the shaft of the distal section, allows some automatic self-adjustment to maintain proper traction when muscles spasm.
♦ Seat the padded "T-bar" firmly against: • Medial side of the thigh of the injured lower extremity and genitalia at the ischial tuberosity and the pubic bone **OR** • Outside of the injured lower extremity	• Remove any bulky clothing and pad the area if necessary. • Ensure that the genitals are not compressed. • Use the groin strap to maintain traction against the pubis when placing the splint on the outside of the injured lower extremity. • The "outside" method does not pull traction as well as the "inside" method. However, it is more comfortable. The "T-bar" is extremely uncomfortable after a brief period for both male and female patients.
♦ Pad the groin area and between the lower extremity and pole of the splint - *if indicated*	• Pad the groin area and make sure no pressure is directly on the external genitalia or bony areas.
♦ Secure the groin (ischial) strap high around the upper thigh of the injured lower extremity	• The groin strap should be angled up toward patient's hip to prevent the strap from slipping down when traction is applied. • The groin strap must be placed next to the side of the injured lower extremity.
♦ Size the ankle harness just above the ankle for a secure fit: • Fold the extra ankle pads out - *if not needed*	• To maintain foot in proper alignment: - place the fixed padded part of the ankle harness under the posterior aspect of the ankle - ensure that the harness strap pulls from the underside of the foot
♦ Tighten the ankle harness above the ankle: • Bring the end of harness up • Cross the Velcro closures one end over the other • Pull the strap down to the sole of the foot	• The ankle harness can be temporarily disconnected from the splint for easier application of the harness around the lower extremity.
♦ Attach the ankle harness to the splint and tighten - *if not already attached*	• Reduce slack in the traction strap. Failure to reduce the slack may result in inadequate traction and separation of the metal pole when traction is applied. • The ankle harness cannot be applied to the second lower extremity if traction has already been applied.

UNIPOLAR TRACTION SPLINT PROCEDURE (SAGER)	
Skill Component	**Key Concepts**
♦ Extend the splint's inner pole to apply traction about 10% of body weight to maximum of 15 lbs. • Hold the upper portion of the metal pole while pulling traction • Apply counter-traction to the groin • Align red arrow with the proximal weight marker • Stabilize upper part of splint to prevent movement of the injured lower extremity	• Manual traction must be applied if the lower extremity is raised. • The ankle harness may be used to assist in elevating the lower extremity. • Recommended traction applied is <u>10% of body weight per femur fracture</u> with maximum of 15 lbs. per lower extremity. If both femurs require traction, apply maximum of 30 lbs. • Maximum traction for <u>lower extremity fractures</u> is 10 lbs. However, traction is generally not indicated for lower extremity fractures unless the limb has neurovascular compromise. • **DO NOT** over stretch the limb, this may cause further injury. • Adequate traction is applied when the injured lower extremity is the same length as the other lower extremity or until the patient feels relief. • Most patients will not get pain relief until the splint has been applied for several minutes and the muscle spasm subsides.
♦ Release the pull on the distal section and ensure the ratchet is locked	
♦ Check the groin strap and tighten it as needed for snug fit	• If the strap slips and traction is released, this will result in potential increased damage to tissue, nerves, and blood vessels.
♦ Secure the splint to lower extremity(s) with the cravats (elastic straps) at the level of the: • Thigh(s) • Knee(s) • Lower leg(s) - above the ankle harness • Both extremities together - <u>*if extra long (figure 8) strap is available*</u>	• May secure one (1) lower extremity or both extremities at the same time. • Avoid excessive pressure on the knees if possible when securing the cravats. • Cravats cannot be secured before traction has been-applied: - It may interfere with pulling traction along the entire length of the lower extremity - It may cause angulation and excessive tightening of the strap, which may result in compromised circulation • Use the hollow of the knee to initially place the cravats and then move into proper position to minimize lower and mid-limb movement. Stack cravats on top of the other in order of use. • Slide the cravats into position starting with the one closest to the ground. • The Sager does not elevate or stabilize the lower extremity when the patient is moved, therefore, additional support and splinting is required. This is accomplished by securing both extremities and feet together. • Secure both feet together with figure 8 strap - <u>*if not already secured*</u>: • Place the strap under ankles • Cross the straps and bring them between both feet • Bring the crossed straps under soles of feet • Bring straps over top of feet • Secure the straps
♦ Attach the ankle harness to the splint and tighten - <u>*if not already attached*</u>	
♦ Secure the patient and the splint to the back board	• Securing the patient and splint to the backboard with the straps will stabilize the hip joint and prevent movement of the splint during transport.

Skill Component	Key Concepts
♦ Re-assess the distal extremities for: • Circulation/Pulse • Sensation • Motor movement } CSM	• Since the uninjured lower extremity is also secured, it is important to make sure that nerves and circulation are not compromised in either lower extremity.

UNIPOLAR TRACTION SPLINT PROCEDURE (SLISHMAN)

Skill Component	Key Concepts
♦ Place the Slishman splint on ground next to the injured extremity.	• The benefits of the Slishman splint include: o May be used if the patient has a concurrent ankle or foot injury by adjusting the position of the ankle strap. o The pole does not extend beyond the patient's foot thereby facilitating transport by ambulance or helicopter. • For pediatric patient under 43 inches or < three (3), allow the splint to rest proximal to the hip
♦ Remove the ankle strap and receiver cap from the pole	
♦ Apply the Velcro ankle strap to the ankle ***Ensure the Velcro strap does not come in contact with the lower leg*** ***Ensure the pole receiver is on the lateral aspect of the ankle and is in the "up" position***	• The lower leg consists of the area just distal to the knee and is proximal to the ankle.
♦ Pad the groin area and between the lower extremity and pole of the splint - *if indicated*	• Pad the groin area and make sure no pressure is directly on the external genitalia or bony areas.
♦ Attach the groin (ischial) strap high around the upper thigh of the injured lower extremity *** Snaps the male to female buckle*** *** Checks the groin strap and tighten it as needed for snug fit***	• The groin strap should be angled up toward patient's hip to prevent the strap from slipping down when traction is applied. • The groin strap must be placed next to the side of the injured lower extremity. • If the strap slips and traction is released, this will result in increased damage to tissue, nerves, and blood vessels
♦ Open the lower clamp and extend the pole	• The pole **SHOULD NOT** extend past the end of the ankle. If it is, it cannot be placed into the receiver on the ankle strap.
♦ Place the end of the pole into the receiver	• The receiver is located on the ankle strap.
♦ Pull on the pole to apply course traction until resistance is met ***Close the clamp*** ***Insert the pole into the receiver cap***	• As soon as resistance is met, do not apply any additional traction. • You know that adequate traction is achieved when the patient feels some relief.
♦ Apply fine traction – if indicated ***Open the clamp and pull on the cord at the top of the pole*** ***Close the clamp***	• If the patient has not experience any relief from the initial application of traction, apply fine traction until the patient experiences relief.
♦ Apply the leg strap to both legs just distal to the knee	• Application of the leg strap helps with stabilization during transport.
♦ Re-adjust the two (2) clamps prior to transport:	
♦ Secure the patient and the splint to the back board	• Securing the patient and splint to the backboard with the straps will stabilize the hip joint and prevent movement of the splint during transport.

♦ Re-assess the distal extremities for: • Circulation/Pulse • Sensation • Motor movement } CSM	• Since the uninjured lower extremity is also secured, it is important to make sure that nerves and circulation are not compromised in either lower extremity.

RE-ASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
♦ Re-assess the patient a minimum of every five (**5) minutes or sooner:** • Primary assessment • Relevant portion of the secondary assessment • Vital signs: BP, P and RR • CSM of injured extremity	• This is a priority patient and must be re-evaluated at least every five (5) minutes or sooner, if any treatment is initiated, medication administered, or condition changes.
♦ Evaluate results of reassessment and note any changes from patient's condition and vital signs *****Manage patient condition as indicated.***	• Evaluating and comparing results assists with recognizing if the patient is improving, responding to treatment, or if their condition is deteriorating.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Verbalize/Document: • Mechanism of injury • Description of injury • Treatment provided • Patient response to treatment • Circulation/ Sensation/Motor movement before and after splinting	• Documentation must be on either the Los Angeles County EMS Report, ePCR, or departmental Patient Care Record form.

Developed 11/01, Revised 10/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

MUSCULOSKELETAL INJURY
BIPOLAR TRACTION DEVICE - HARE SPLINT

Supplemental Information

INDICATIONS:

- Mid-shaft femur fracture

CONTRAINDICATIONS:

- Injury close to the knee
- Injury to the knee
- Injury to the hip
- Injury to the pelvis
- Partial amputation or avulsion with bone separation, distal limb is connected by marginal tissue
- Lower leg or ankle injury

COMPLICATIONS:

- Neurovascular compromise, if traction splint is applied incorrectly.
- Injury to genitals, if groin strap is not positioned correctly.

NOTES:

- Traction splints may be used on open or closed femur fractures, especially when there is neurovascular compromise, uncontrollable bleeding and severe pain due to muscle spasm.
- **DO NOT** secure the straps before traction has been established. This may interfere with pulling traction along the entire length of the extremity and can cause angulation and excessive tightening of the strap resulting in compromised circulation.
- Adequate traction is applied when the injured extremity is the same length as the other extremity or the patient feels relief.
- Never release the mechanical traction unless manual traction is re-established. The release of traction may cause additional injury to the extremity.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

NEUROLOGICAL EMERGENCY / SPINAL MOTION RESTRICTION (SMR)
VEST–TYPE EXTRICATION DEVICE FOR THE SEATED PATIENT

PERFORMANCE OBJECTIVES:

Demonstrate competency in performing and directing team members in performing spinal motion restriction in the seated patient spinal restricting the movement of the head and neck using an extrication device for the seated patient when the patient meets the indications.

Perform and direct team members to secure a simulated patient using an extrication device used for the seated patient who meets the indications for spinal

CONDITION:

The EMT is the designated Team Leader on a patient who requires full Spinal Motion Restriction (SMR). There is no need for rapid extrication. Necessary equipment will be adjacent to the patient or brought to the field setting.

EQUIPMENT:

Live model or manikin, chair or car, various sizes of extrication collars, extrication device for the seated patient, long spine board, straps or binders, head-neck immobilizer, padding material, 2-3" cloth tape, 3 assistants, goggles, masks, gown, gloves, trauma bag.

PERFORMANCE CRITERIA:

- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions (BSI)	• Mandatory (minimal) personal protective equipment – gloves
♦ Assess the environment for safety	• Check for airbag deployment. If the airbags did not deploy, use caution during assessment and extrication. You may need to request the appropriate resources deactivate the air bag system. • Ensure the vehicle is turned off. Motors on electric vehicles are very quiet. • If you are in a confined space, ensure the area is safe from falling debris in confined space.
♦ Determine the level of SMR required ***Request three (3) additional rescuers if SMR is indicated***	• Refer to Los Angeles County Reference Number 1334 60 • SMR is best achieved by four (4) rescuers: 1. Team Leader – positioned at the chest 2. Head – 3. Hips/Abdomen 4. Legs • The Team Leader is typically positioned at the chest and is the one (1) responsible for giving directions to the additional rescuers. • The sole job of the patient at the head is to minimize movement of the head and neck.
♦ Approach the patient from the front – *if possible*	• Approaching the patient from the front, whenever possible, will hinder the patient from having to turn his/her head to look at the EMS provider.
♦ Assess the need for additional BSI	• Situational - goggles, masks, gown
♦ Direct the patient not to move or turn his/her head: • Explain importance of remaining still • Explain the care being delivered	• Keeping the head still will decrease the potential for further injury. • Providing an explanation of the procedure may assist with decreasing anxiety and promote a greater degree of cooperation.

PROCEDURE	
Skill Component	**Key Concepts**
TEAM LEADER: ♦ Place the patient's head in neutral in-line position and maintain axial stabilization throughout procedure - *unless contraindicated* ***Team leader should relinquish manual stabilization of the head/neck to an assistant as soon as they arrive*** ***Direct the assistant to take over maintaining manual stabilization of the patient's head and neck*** ***Ensure manual stabilization is always maintained during the switch***	• The team leader is responsible for the patient assessment and for directing patient care and should **NOT** be the rescuer to physically maintain SMR of the spine. • Axial stabilization of the neck results in stabilization of the head and neck. • Maintain manual stabilization of the patient's head and neck until movement of the patient's head is restricted by the application of a cervical collar and the extrication device. • Depending on the situation, the rescuer who initiates and/or maintains axial stabilization may be positioned either behind or at the side of the patient. • To prevent extension, flexion, lateral bending, or rotation of the head, place your thumbs facing anteriorly just below the zygomatic arches and spread fingertips along the sides of the face with the little fingers touching the base of the occiput. **DO NOT** apply traction. • The sole focus of the rescuer at the head and neck of the patient should be to maintain axial stabilization throughout the procedure. • SMR begins with manual control of the head and neck. The C-collar is applied after the primary and neck assessment is completed. • **NEVER** apply traction when restricting the motion of the neck. • **DO NOT** attempt to move the head into an in-line position if the head is grossly misaligned (no longer extends from midline). • Moving the head may result in: - compromising the airway or ventilation - initiating or increasing muscle spasms of the neck - increasing neck pain - initiating or increasing neurological deficits - encountering resistance when attempting to move the head of an unconscious patient • Move the head into an in-line position. Movement of the head and neck must be limited, and should be restricted to the position it was initially found if any of the following conditions are present: - head is grossly misaligned (no longer extends from midline) - moving the head into a neutral in-line position results in: ~ compromising airway or ventilation ~ initiating or increasing muscle spasms of the neck ~ increasing neck pain ~ initiating or increasing neurological deficits ~ encountering resistance when attempting to move the head of an unconscious patient

Skill Component	Key Concepts
♦ Prepare the extrication device	• Remove the leg straps at this point since they are usually secured behind the head of the device. Freeing the straps at this time avoids unnecessary movement of the patient later on. • If the leg straps are not going to be used, leave them attached in the storage configuration so they will not interfere with the extrication device.
Assess the distal extremities for: • **C**irculation/Pulse • **S**ensation • **M**otor movement } CSM	• Asses the condition of the extremities prior to moving the patient and when SMR procedure has been completed. • **C**irculation/Pulse - palpate for the distal pulses in the extremities and mark with an "X." Check for pulse characteristics, color, temperature, capillary refill. • **S**ensation - determine numbness or tingling and sensitivity to touch. • **M**otor movement - have patient wiggle fingers or toes.
♦ Assess neck/cervical spine for **DCAP-BTLS TIC**	• **DCAP/BTLS TIC** is a mnemonic used for a rapid trauma assessment. These elements act as guide for the assessment information that is specific to each body part. • Check for a tracheal stoma. If stoma is present, restrict head and neck movement by using an approved spinal motion restriction device/procedure and **DO NOT** apply cervical collar. • The neck and cervical spine are assessed for **DCAP/BTLS TIC** -**D**eformity (visible and palpated) -**C**ontusions -**A**brasions -**P**enetrations / Punctures -**B**urns/bruises -**T**enderness -**L**acerations -**S**welling / Scars • Palpate for: - **T**enderness - **I**nstability - **C**repitus • Additional Assessment Elements - Track marks and tattoos - Medical alert tags, jewelry - Jugular vein distention (JVD) - Tracheal deviation - Accessory muscle use - Subcutaneous emphysema (crepitus) - Stoma • Medical Devices: - Tracheostomy - Central venous catheters
♦ Size and apply a cervical collar ** ***Ensure the cervical collar does not obstruct the airway and hinder mouth opening, ventilation or circulation***	• Most cervical collars have an opening at the anterior neck, which allows for only limited examination. Therefore, the neck must be thoroughly assessed prior to the application of the cervical collar. • Cervical collars do not accommodate an angulated or rotated head. Therefore, **DO NOT** attempt to apply a cervical collar if the head is not in an in-line position. • Cervical collars **DO NOT** "immobilize" the neck. They allow for 25-30% of motion by flexion and extension and up to 50% for other types of motion.

	Continued… • A unique function of the cervical collar is to rigidly maintain a minimum distance between the head and neck to eliminate intermittent compression of the cervical spine. • An incorrectly sized cervical collar may cause hyper-flexion, hyperextension, or compression of airway and great vessels. • A cervical collar that hinders the mouth from opening may lead to aspiration if the patient vomits. • Improperly sized cervical collars may result in complications if: - **<u>too loose</u>** it is ineffective and can cover the anterior chin, mouth, and nose resulting in airway obstruction. - **<u>too tight</u>** it can compress the carotid arteries and neck veins. - **<u>too short</u>** it will not protect the cervical spine from compression and allows for significant flexion. - **<u>too tall</u>** it will cause hyperextension of the head. • There are times when a patient's neck cannot be properly fitted with a cervical collar at all. In these cases, improvised devices must be used (towel roles, trauma dressings, rolled blankets) in an attempt to restrict the movement of the patient's head and neck.
♦ Check for signs and symptoms of obstructed breathing: - Choking - The patient cannot speak – *if conscious* - Coughing - Cyanosis	• Direct pressure on the anterior neck may result in compression of the trachea/carotid arteries or large veins of the neck.
♦ Lean the patient forward as a unit and remove any articles and debris behind the patient ** ***Ensure spinal alignment is not compromised***	• Articles and debris can interfere with sliding the extrication device between the patient and the seat. • Moving the patient slightly forward (i.e. a hand's thickness) will assist in placing the extrication device appropriately and reducing friction. • To avoid jostling the patient's head, coordinate the patient's movement forward while maintaining axial stabilization of the head.
♦ Assess the back	
♦ Tilt the extrication device at a 45º angle and slide the device behind the patient until it is aligned with patient's spine	• Place the Velcro and buckle side of the device against the seat and away from the patient. • Tilting the device: - Prevents the extrication device from rolling up - Allows the extrication device to clear a roofline
♦ Pull the extrication device up vertically until the torso flaps are positioned securely in both axillae ** ***Ensure the movement of the patient's head is minimized during this maneuver*** ** ***Ensure the device is centered alongside the patient's spine***	• The rescuer stabilizing the head lifts his/her elbow slightly to provide clearance for the extrication device and taking care not to move the head. • Use the lift handles to center the extrication device behind the patient.
♦ Adjust the patient's position and gently lean the patient back against the device	• To check and adjust patient's position, the rescuer behind the patient continues to manually stabilize the head and neck, and the rescuer on the side of the patient gently places the patient's chest in contact with the device. • Some patients may not be able to sit fully back into the device.

	Continued… • Positioning the patient as close as possible against the device helps to <u>minimize</u> the amount of padding needed between the head, neck and shoulders, and the extrication device.
♦ Wrap both torso flaps around the patient, just below the axillae ***Ensure the extrication device is in contact with the patients back as much as possible.*** ***Ensure the top edges of the torso flaps press firmly into both axillae*** ***Fold 2 slats of each torso flap inward for pregnant patients***	• The lift handles should be used to raise and adjust the torso flaps under both axillae to keep the device in place until the straps can be buckled. • It is important that the extrication device fits snug under both axillae to ensure the patient's weight is suspended and prevent the patient slipping down when lifted.
♦ Verbalize the correct order for applying and securing the patient in the KED device. • **<u>First</u>** - the <u>middle</u> <u>torso</u> strap • **<u>Second</u>** - the <u>bottom</u> torso strap • **<u>Third</u>** - the <u>leg</u> straps • **<u>Fourth</u>** - fill the void between the <u>head</u> and the device • **<u>Fifth</u>** - the <u>top</u> torso strap	• **<u>Feed-and-pull tightening technique</u>** - Grasp the portion of the strap and create a little slack in the strap. - Feed the slack into the buckle with the other hand. - Repeat until the strap is snug or tight. • The <u>middle strap</u> secures the area of the extrication device. • The middle and bottom straps must be tightened only enough to leave a space between the strap and patient's chest. This is determined by placing 2-3 fingers flat between the strap and the patient's chest. • Straps must never be twisted as this may compromise the patient's stability in the device or cause additional discomfort and skin breakdown. • Ensure that the top strap is not fastened at this time, but is clear and <u>not</u> under the middle or bottom strap *Note: The top strap is <u>secured</u> and the rest of the torso straps are <u>tightened</u> just before the patient is transferred to a long spine board.*
♦ Attach and adjust the middle torso strap	• If the patient is pregnant, crisscross the middle and bottom straps to keep abdominal area free.
♦ Attach and adjust the bottom torso strap	•
♦ Attach and adjust the leg straps **<u>Crisscross configuration</u>** • Cross the straps at the groin and buckle the straps opposite their sides of origin ***OR*** **<u>Same-side configuration</u>** • Cross the straps at the groin, but buckle them on their sides of origin ** ***Ensure straps lie flat from their anchor point and are as close as possible to the body's midline***	• Tighten both straps and leave a space between the leg and the strap. You should be able to place 2-3 fingers lying flat between the strap and the patient's leg. • If groin injuries are suspected, the EMS provider should consider whether the use of leg straps will aggravate the injury. • Directions for <u>applying leg straps</u>: - Pass one leg strap between the leg and car seat and "see-saw" the strap into position under the patient's leg and buttock. • Straps in either the crisscross configuration or same-side configuration must be positioned as close as possible to the body's midline (straight down) from their anchoring points on the back before passing beneath the buttocks. • **DO NOT** cross straps at the groin, but buckle them on their sides of origin • Extra care must be taken to prevent pressure on the groin when using the same-side configuration. Ensure that the leg straps are in the correct position and are close to the midline of the body. This requires a more focused effort because the tendency is to place the straps away from the midline.

Skill Component	Key Concepts
♦ Place padding behind patient's head and neck - *if indicated*	• The padding should be placed without hyperextending or flexing the neck • The amount of padding depends on the patient's medical condition, body structure, and head shape. Some patents may not need padding when they are placed in the extrication device correctly. • Placing padding behind the head and neck ensures neutral alignment of the spine. The Adjusta-Pad can use or other suitable padding.
♦ Wrap the head flaps around the patient's head	
♦ Secure the patient's head: **Upper strap (head)** • Center the rubber padded strap or tape over the patient's forehead (tape must adhere to skin) • Position strap ends or tape at a downward angle and secure them to the fastening straps on the head flaps **Bottom strap (neck)** • Place strap or tape against a rigid area beneath the "chin" of the cervical collar and above the neck opening • Position the strap ends or tape horizontally and secure them to the head flaps ** ***Ensure tape adheres to the skin.***	• If the upper strap contains a rubber pad: - Grasp the strap with both hands - Turn the pad fully inside-out exposing the rubber pad - Center the pad at the patient's forehead with the rubber against the skin • Placing the head strap or tape at a downward angle minimizes the chance that the strap will slip upward on the forehead. The rubber or tape keeps the strap from sliding. • A patient should not be able to move his/her head if the tape is properly placed and adhered to the patient's skin. Therefore, **DO NOT** use gauze or folded tape over the forehead. • If there is a gap between the extrication device and the patient's head, cervical collar or shoulders, padding needs to be placed without hyperextending or flexing the neck. • The Adjusta-Pad can be folded or other padding materials used if additional thickness is needed.
♦ Fasten and snug the top torso strap using the feed-and-pull tightening technique	• Snug both straps leaving a space between the chest and strap by placing 2-3 fingers flat between the strap and the patient's chest.
♦ Evaluate the application of the device and makes adjustments as needed	• Check that the flaps are secure in both axillae, the head is in the in-line position, and that straps and pads are secure.
♦ Ensure all straps have been tightened prior to transferring the patient to the long spine board.	• Straps should be tightened in the following order: - middle torso strap - bottom torso strap - leg straps - top torso strap • Straps should be placed across chest in manner that does not compromise chest expansion and increase intra-abdominal pressure. Have patient inhale to check for adequate chest expansion. The patient must still be able to take a full tidal volume breath. You should be able to easily insert 1-2 fingers between the strap and the patient. • Head straps are already secured and do not need to be tightened and further.
♦ Re-assess breathing for adequate chest expansion	
♦ Re-assess all extremities for: • Circulation/Pulse • Sensation • Motor movement } CSM	• Asses the condition of the extremities prior to moving the patient and when SMR procedure has been completed. • **C**irculation/Pulse - palpate for the distal pulses in the extremities and mark with an "X." Check for pulse characteristics, color, temperature, capillary refill. • **S**ensation - determine numbness or tingling and sensitivity to touch. • **M**otor movement - have patient wiggle fingers or toes.

Skill Component	Key Concepts
♦ Remove the patient from the vehicle using appropriate extrication technique	• Remove the patient by using the side lifting handles and supporting the legs. This minimizes the need to grasp the extremities or clothing to move the patient.
♦ Place the patient onto a long spine board	
♦ Loosen the top torso strap without unfastening the buckle	• Decreased chest expansion may results in asphyxia. Loosening the top torso strap allows for full chest expansion.
♦ Loosen and/or remove the leg straps	• Loosening and/or removing the leg straps provides for patient comfort.
♦ Keep remaining straps tightened ** ***Ensure patient is well padded if leg straps were not applied, removed or have loosened and not retightened***	• Keeping the remaining straps tightened provides stability during transfer to the ambulance.
♦ Secure patient's torso and legs to spine board	• Securing the patient to the spine board prevents further injury if patient needs to be tilted or rolled to the side.
♦ Remove the patient's shoes and socks	• When shoes and socks are left on the patient, assessing feet for circulation, motor movement/function and sensation, cannot be properly assessed.
♦ Remove bottom head strap (neck)	• **DO NOT** use a chin strap to immobilize the head. The patient may aspirate if he/she cannot open his/her mouth in case of vomiting. Compression of the trachea and carotid arteries may occur.
♦ Restrict the motion of head and neck by using an approved device ** ***Ensure device does* not compromise patient's *airway, carotid arteries or neck veins*** ** ***Reduce or remove occipital and neck padding - if indicated.***	• Always secure the patient's head last to spine board since the body weighs more that the head in adults and may pull the spine out of alignment if the body is not secured first. • Re-evaluate if padding is adequate to ensure SMR is maintained and it does not compromise the airway. • Reducing or removing the occipital and neck padding prevents hyper-flexion of neck if padding is not needed.
♦ Re-assess all extremities for: • **C**irculation/Pulse • **S**ensation • **M**otor movement } CSM ** ***Correct area of circulatory compromise – if needed***	• Asses the condition of the extremities prior to moving the patient and when SMR procedure has been completed. • Once spinal motion restriction has been instituted only a physician should determine if the patient can be removed from the restriction device.
♦ Ensure the unconscious patient's arms are secured prior to rolling the patient to the ambulance - Conscious patients - Unconscious patients	• The patient's arms should be secured next to the patient's side or across the torso prior to moving the patient. • For **conscious** patients, their arms do not need to be secured for transport. For **unconscious** patients, their arms should be secured. However, in both cases, you should anticipate the treatment needs of the patients. Gaining IV access or reassessment vital signs may require leaving one (1) arm accessible. • The patient's arms should not be included in the hips or groin loops (if used). If these straps are tight enough to immobilize, they will compromise circulation.
♦ Lifts the long spine board with the patient onto the gurney	•
♦ Secure the long spine board with the patient to the gurney	• Securing the long spine board to the gurney prevents the board with the patient from falling off the gurney during transport to the ambulance. • The backboard only serves as an extrication device
♦ Roll the gurney to the ambulance	
♦ Un-secure the long spine board with the patient from the gurney prior to loading the patient into the ambulance.	

Skill Component	Key Concepts
♦ Remove the KED device from the patient by: • Unbuckle the straps in the following order: o Top head strap o Top torso strap o Leg straps – if not already removed prior o Bottom strap o Middle strap	• The straps/padding **MUST** be removed opposite of the order they were applied. Removing the straps any other way may place undue pressure on the neck.
♦ Roll the patient off the long board just prior to loading the patient inside the ambulance, while maintaining SMR of the head and neck	• The backboard should not be maintained during transport for the purpose of SMR. Whenever possible, patients should be rolled off the backboard prior to transport. Exceptions include hemodynamically unstable patients or when there are scene safety concerns and transport must commence immediately. • Once the patient has been placed onto the ambulance gurney, the backboard does not provide any advantage. Additionally, remaining on the backboard may cause harm to the patient related to increased pain and increased lateral movement.

RE-ASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
§ Re-assess the patient at least every **5 minutes for** unstable patients and every **15 minutes for stable** patients. • Primary assessment • Relevant portion of the secondary assessment • Vital signs: Blood pressure, pulse, S_pO_2, and respirations *****Manage patient condition as indicated.***	• Unstable patients are those who have abnormal vital signs, S/S of poor perfusion, or if there is a high suspicion that the patient's condition may deteriorate. • Evaluating and comparing results from a prior assessment assists with recognizing if the patient is improving, responding to treatment, or deteriorating.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Report and document: • Mechanism of injury • Neuro and circulatory findings of all 4 extremities **before and after** spinal motion restriction has been instituted • Injuries sustained • Treatment rendered and response	• Documentation must be on either the Los Angeles County EMS Report or departmental Patient Care Record form, or ePCR. • Documenting reassessment information provides a comprehensive picture of patient's response to treatment. • The reassessment information (before patient care is transferred) should be documented in the section of the EMS form that is called "Reassessment after Therapies and/or Condition on Transfer."

Developed: 2/05, Revised 11/2018

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

NEUROLOGICAL EMERGENCY / SPINAL MOTION RESTRICTION (SMR)
VEST–TYPE EXTRICATION DEVICE FOR THE SEATED PATIENT
Supplemental Information

INDICATIONS:

- For suspected injuries to the spine when a patient is found in a lying or sitting position and extrication is required.

CONTRAINDICATIONS FOR ATTEMPTING NEUTRAL IN-LINE POSITION OF THE HEAD:

- If head is grossly misaligned (no longer extends from midline)
- If moving the head into a neutral in-line position results in:
  - compromising airway or ventilation
  - initiating or increasing muscle spasms of the neck
  - increasing neck pain
  - initiating or increasing neurological deficits
  - encountering resistance when attempting to move the head of an unconscious patient

COMPLICATIONS:

- Hypoventilation
- Aspiration
- Asphyxia

COMMON MISTAKES:

- Inadequate SMR – leads to movement within the device if the device is not adequately secured.
- Lack of appropriate padding under occiput for adults and older children – results the head to be hyperextended.
- Lack of appropriate padding under shoulders and torso in toddlers and infants – results the head to be hyper-flexed.
- Failure to reassess patients for circulation, sensation, motor movement, airway compromise, and inadequate chest expansion – may result in increased neuro deficits or death.
- Taping or placing straps across the chin – may cause aspiration resulting in airway obstruction.
- Improper materials used for head SMR such as IV bags and sandbags – may cause further injury if the patient's position is shifted or is moved.
- Sizing cervical collars in place – may jostle the patient's head and neck resulting in additional discomfort or spinal compromise.
- Failing to remove the long spine board and KED device after the patient has been placed on the gurney.

TIGHTENING THE STRAPS:

- Remove excess slack from the strap after removing from storage position and before placing device on the patient.
- To secure a fractured pelvis use the lower portion of the extrication device.
- When groin injuries are suspected, use the same side configuration or **DO NOT** use leg straps
- Use caution in placing leg straps if patient has a possible hip or femur fracture – lower legs cannot be secured.
- Use the feed-and-pull technique to snug or tighten straps so that the patient's torso is not jostled during the SMR process.

  Feed-and-pull technique:
  - Grasp the portion of the strap and create a little slack in the strap.
    - Feed the slack into the buckle with the other hand.
    - Repeat until the strap is snug or tight.

ORDER FOR SECURING AND TIGHTENING THE STRAPS (some devices have color coded straps)

- Torso – middle strap
- Torso – bottom strap
- Leg straps
- Head – upper strap
- Torso – top strap – **may initially be buckled, but do not tighten until patient is ready to be transferred to a long spine board.**
- Neck – bottom head strap – **must be removed prior to securing patient's head to the back board.**

VEST–TYPE EXTRICATION DEVICE FOR THE SEATED PATIENT
Supplemental Information (Continued)

TRANSFERRING PATIENT TO THE LONG SPINE BOARD:

- Pivot, tilt, and lift patient until his/her back is toward the outside of the vehicle. Both rescuers must be on the same side of the vehicle.
- Slide the spine board between the patient and the seat
- Lift vest and patient out of vehicle and onto long spine board
- Remove the bottom neck strap.

ADAPTING EXTRICATION DEVICE FOR A PREGNANT PATIENT:

- Fold 2 slats inward of each torso flap inward to leave abdomen free.
- Straps can be positioned to lie beneath the breasts but above the abdomen.
  - Two strap method – fasten bottom strap in the middle buckle and middle strap in bottom buckle.
  - Three strap method – fasten middle strap in its own buckle, bottom strap in top buckle, and top strap in bottom buckle.

ADAPTING EXTRICATION DEVICE FOR PEDIATRIC PATIENTS:

- Child's size and condition determines how the extrication device can be adapted.
- If legs are longer than the extrication device, the child is placed in the device and then onto a long spine board.
- If extra padding is needed due to a small size, a folded blanket can be placed on the child so the torso flaps can be wrapped and fastened normally.
- Keep children in the car seat if they are stable; car seats provide an excellent SMR device if no damage to it has been sustained.

ADAPTING EXTRICATION DEVICE FOR AN ANGULATED NECK:

- Fold the head flaps inward, position a rolled towels as needed.
- Place head strap across forehead and secure strap to the fastening strips.

ADAPTING EXTRICATION DEVICE WHEN USING AN AED OR MANUAL DEFIBRILLATOR AND PLACING ECG LEADS:

- Fold 2 slats of each torso flap inward to provide more chest exposure. Loosening 2 of the 3 torso straps allows defibrillation without losing immobility.

ADAPTING THE EXTRICATION DEVICE FOR HIP AND FEMUR STABILIZATION:

- Place the extrication device on a long spine board with the head portion of the device toward the foot end.
- Center the torso portion of the device slightly above the waist.
- Secure the torso flaps around the patient.
- Wrap the head flaps around the injured leg and secure with the head straps.

ADAPTING THE EXTRICATION DEVICE FOR PELVIC STABILIZATION:

- Place the extrication device on a long spine board with the head portion of the device toward the foot end.
- Center the torso portion of the device slightly above the waist.
- Secure the torso flaps around the patient's pelvic area.
- Wrap the head flaps around both legs and secure with the head straps.

COMPONENTS OF A TRAUMA BAG:		
Adhesive dressings (Band-Aids®	**Dressings – Trauma, 4X4, Vaseline**	**Gauze bandages**
Trauma shears	**Splints – long, short, and traction**	**Extrication device**
Commercial chest seals	**Tape – assorted sizes**	**Head immobilizer device**
Tourniquets	**Occlusive dressing / Vaseline gauze**	**C collars**
Hemostatic dressings	**Normal saline irrigation**	**Flashlight**
PPE: gloves/gown/goggles	**Burn pack or burn sheet**	

Section 7:
OB / Pediatrics

Learn the Facts

You should have a comprehensive understanding of:

- Anatomy & Physiology
- Conditions listed in the index
- Glossary words
- Medical terms listed in each chapter
- Pathophysiology

Understand the Concepts

You should have an extensive understanding of the following:

1. Anatomical differences in pediatric populations
2. Complications from spinal immobilization
3. Dysfunctional bleeding in a pregnant patient
4. Expected anatomical and physiological changes for each trimester
5. Indications for suctioning a newborn
6. Pathophysiology of a febrile seizure
7. Pediatric Assessment Triangle (PAT)
8. Signs and symptoms of abruptio placenta and placenta previa
9. Signs and symptoms of meningitis
10. Stages of delivery
11. Supine Hypotensive Syndrome

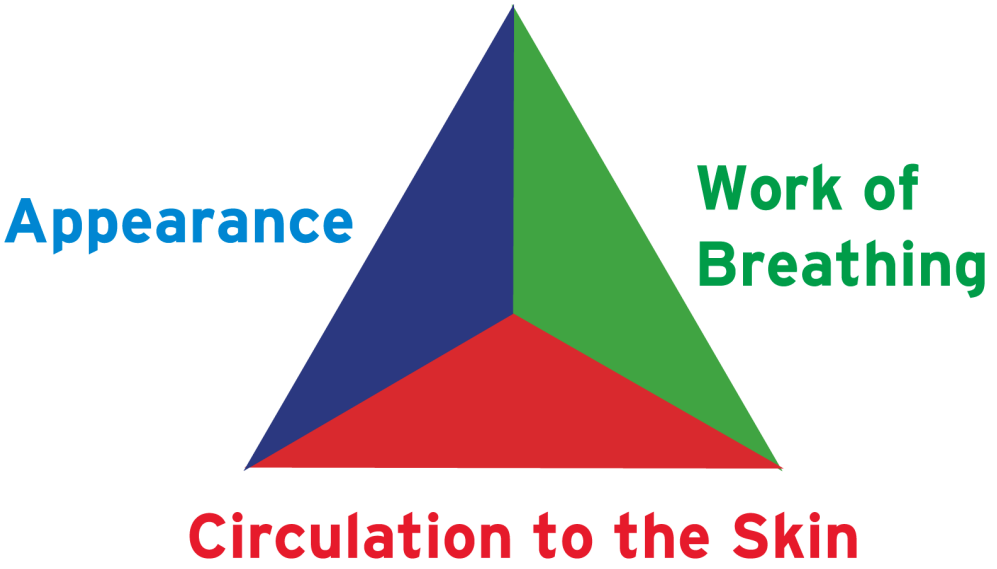
Perform the Skills

Finally, you should be able to:

1. Assist in different types of abnormal delivery (including breech and nuchal cord)
2. Calculate percent of body surface area burns for a pediatric patient
3. Differentiate between preeclampsia and eclampsia
4. Evaluate cardiac arrest situations for the pediatric population
5. Evaluate for inadequate respiratory and ventilation patterns
6. Evaluate upper and lower airway emergencies
7. Recognize a respiratory emergency
8. Recognize an ectopic pregnancy
9. Treat a child with a febrile seizure
10. Treat a female with supine hypotensive syndrome
11. Treat a respiratory emergency

Pediatric Assessment Triangle

- Appearance
  - Awake
  - Aware
  - Upright
- Work of breathing
  - Retractions
  - Noises
- Skin circulation



MEDICAL CONTROL GUIDELINE: PEDIATRIC PATIENTS

PRINCIPLES:

1. Pediatric patients require special consideration in assessment, treatment and medication administration.
2. For destination purposes, pediatric patients in the prehospital setting are defined as children 14 years of age or younger.
3. Treatments, medication concentrations and drug dosages are age- or weight-specific for the pediatric patient.
4. Accurate pediatric drug doses are:
    a. Obtained by measuring the patient against a resuscitation tape to obtain the weight/color zone, and then
    b. Refer to the EMS Agency Color Code Drug Doses L.A. County Kids for the medication doses appropriate to that weight/color zone.
5. Apparent Life Threatening Event (ALTE) is defined as an episode characterized by a combination of any of the following (for children 12 months of age or younger):
    a. Apnea
    b. Choking or gagging
    c. Color change (usually cyanosis but occasionally erythema)
    d. Marked change in muscle tone (usually limpness)

GUIDELINES:

1. Obtain the patient's estimated weight utilizing a pediatric resuscitation tape and document the corresponding weight and color zone on the EMS Report Form.

2. Pediatric Airway Management:
    a. Nasopharyngeal (NP) airway adjuncts are approved for children 12 months of age and older
    b. Bag Valve Mask (BVM) ventilation, NP, or oropharyngeal (OP) airway are approved airway adjuncts for patients who are younger than 12 years of age, OR have a body weight less than 40kg
    c. King airway is approved as a rescue airway for patients who are 12 years of age or older AND at least 4 feet tall
    d. Endotracheal Intubation (ET) for patients 12 years of age or older **or** height greater than the length of the pediatric resuscitation tape.

3. Pediatric Cardiopulmonary Resuscitation (CPR):
    a. Use Neonatal CPR for newborns up to 1 month of age
    b. Use Infant CPR for patients greater than one month of age to less than 13 months of age
    c. Use Child CPR for patients greater than or equal to 13 months of age to the onset of puberty

4. Automatic External Defibrillators (AED):
    Pediatric self-adhering pads or a pediatric attenuator system are recommended for infants and children younger than 8 years of age. Use adult AED for children 8 years of age and older.

A.L.T.E.

(Apparent Life Threatening Events)

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

DEFINITION:

An Apparent Life Threatening Events (ATLE) in a pediatric patient (**12 months and under**) is described as an episode that is frightening to the observer and characterized by some combination of:

- transient apnea
- color change (usually cyanotic or pallid but occasionally erythematous or plethoric)
- marked changes in muscle tone (usually marked limpness)
- choking
- gagging

INCIDENCE:

Various estimates place the incidence in the general population at 0.5% - 6.0% of all infants. For various reasons, the true frequency and prevalence of ALTE are unknown.

SIGNIFICANCE OF ALTE:

A.L.T.E may occur during sleep wakefulness or feeding and may be a symptom of many specific disorders including, but not limited to:

- gastrointestinal reflux
- infection
- seizures
- airway abnormality
- hypoglycemia
- metabolic problems
- impaired regulation of breathing during sleep and feeding

Evaluation:

Infants usually appear entirely normal by the time they reach the Emergency Department! The most important diagnostic step is to obtain a careful **history of current complaint** from the person who witnessed the events:

- Color
  - red
  - pale
  - cyanotic
- Respiratory effort
  - apnea
  - obstruction
  - irregular
- Sleep state
  - awake
  - asleep
- Position
  - prone
  - supine
  - upright
- Noises
  - choking
  - stridor
- Eye Movements
  - closed
  - startled
  - rolled
  - fluttering
- Relationship to feeding
- Fluid in the mouth?
- Duration
- Need for intervention by caretaker

MANAGEMENT OF ALTE:

For ALTE, an aggressive approach is necessary to identify the etiology of the event and to initiate appropriate therapy. **Hospital admission** for protective monitoring, to facilitate the diagnostic evaluation and parental training is recommended.

RESOURCES:

Perkins, Ronald M., "Apparent Life - Threatening Events: Recognition, Differentiation, and Management", The Practical Journal of Pediatric Emergency Medicine: Pediatric Emergency Medicine Reports, November 1998.

Pregnancy Questions

P: Para [# of live births] & Gravida [# of pregnancies]
(Vaginal or Cesarian?) *(Abortions or miscarriages)*

P: Prenatal care
(Are you seeing a doctor? Are you taking prenatal vitamins? Other drugs?)

E: Expected due date / Last menstrual period

B: Bag of waters / Vaginal discharge
(Color / odor?) *(Blood in discharge / active bleeding?)*

B: Bowel movement
(Urge to push?)

L: Last time the baby moved

E: Expected complications
(Multiple births, diabetes, HTN, seizures?)

EMS SKILL

OBSTETRICAL EMERGENCY / EMERGENCY CHILDBIRTH
DELIVERY

PERFORMANCE OBJECTIVES
Demonstrate proficiency in assisting with an imminent delivery and perform initial interventions as necessary.

CONDITION
Assess and assist in the delivery of a newborn and initiate appropriate interventions as needed using a simulated patient. Necessary equipment will be adjacent to the manikin or brought to the field setting.

EQUIPMENT
Obstetrical manikin with newborn, placenta and umbilical cord, 1 assistant, obstetrical kit with OB cleansing towelettes, 4x4s, drapes, sheet, 8 towels, 2 cord clamps, 2 plastic ties, umbilical cord scissors, bulb syringe, obstetrical pad, plastic bag, sterile gloves, newborn blanket, oxygen tank with flow meter, oxygen tubing, adult and neonatal oxygen mask, adult and neonatal bag-valve-mask device, nasal cannula, stethoscope, eye protection, masks, gown, gloves.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Assess: • Personnel/patient safety • Environmental hazards • Number of patients • Mechanism of injury/Nature of illness	• The initial information obtained from the mechanism of injury or nature of illness assists in formulating the field impression.
♦ Establish body substance isolation (BSI) precautions	• Mandatory personal protective equipment – gloves • Situational - eye protection, mask, gown as needed
♦ Assess mother's history pertinent to pregnancy: • Last menstrual period (LMP) and/or expected due date (EDD) • Prenatal care • Number of pregnancies (Gravida) • Number of live births (Para) • Number miscarriages/abortions • Multiple births (twins, etc.) previous and expected • Rupture of amniotic membranes (color and odor) • Vaginal discharge - bleeding - discharge • Any problems with this pregnancy - hypertension - gestational diabetes • Type of previous deliveries - *if indicated* - vaginal - cesarean • Any problems with past deliveries • When was the last time the "baby" moved? • Medications (prescribed, over the counter or recreational drug use) • Allergies	• The LMP or EDD is important to determine if newborn is premature, term or post-term. Can help determines if there are special needs and problems. • Gravida is the number of pregnancies, including the current pregnancy and any spontaneous (miscarriage) or induced (therapeutic) abortions • Para is the number of live births. • *EMS personnel should describe the reproductive history as the number of pregnancies, number of live births, and the number of abortions.* • Vaginal discharge: - frank bleeding may indicate placenta previa - bloody mucus discharge is normal in all 3 stages of labor • Amniotic fluid that is: - clear is normal - greenish or brownish-yellow indicates fetal distress - cloudy or foul smelling fluid indicates an infection. • A previous cesarean section may lead to possible uterine rupture during labor. • Diabetes information is important to prepare for a large newborn and excessive amniotic fluid (polyhydramnios). • Recreational drug use is important to prepare for the possibility of a respiratory distressed newborn.

Skill Component	Key Concepts
♦ Assess contractions: • Frequency • Duration • Intensity	• Frequency of contractions is from the onset of one contraction until the onset of the next contraction. • Duration of the contraction is from the onset of one contraction to its completion. • Intensity is the strength of the contractions. As the strength of each contraction increases, the peaks will come sooner and last longer.
♦ Determine if delivery is imminent: • Perineum is bulging • Crowning present • Contractions 2-3 minutes apart • Mother has urge to push	• Crowning is the most reliable sign of imminent delivery. However, if signs of imminent delivery it is best to have mother deliver on scene and not enroute. • The mother may or may not have the urge to push. The urge to push is due to the newborn moving into the birth canal and pressing the vaginal wall against the rectum and stimulating the sacral nerves; this may be interpreted by the mother as having to have a bowel movement.
♦ Determine need for: • Additional resources • Specialized equipment ** ***Consider equipment needed for administration of oxygen to the mother and/or newborn***	• Maintaining privacy for the mother is essential. Makeshift protective screens can be improvised with tarps, blankets, sheets, furniture, etc. • Oxygen equipment of various sizes must be available for mother and newborn. • Have emesis basin ready in case mother becomes nauseated and possibly vomits.
♦ Put on additional protective equipment: • Gown with long sleeves • Face mask • Eye protection • Gloves (non-sterile if not already applied)	• Sterile gloves, gown, face mask, eye protection should be put on to protect the healthcare providers from the splashing blood and bodily fluids during delivery. This protective equipment also protects the mother and newborn from contamination.
♦ Position mother: • Place in a Semi-Fowler's position • Elevate buttocks with pillow or blanket 2"- 4" • Remove clothing that obstructs perineum • Pull up knees and spread apart	• Use caution to avoid inference of impropriety. Always have a team or family member, if available, in attendance when touching a woman's perineal area. • Place mother in a safe delivery position to prevent injury to a slippery newborn.
♦ Open obstetrical (OB) kit	• Position the OB kit on a nearby surface so that all items are easily accessible.
♦ Cleanse perineum with OB cleansing towelettes (wipe top to bottom)	• Cleansing by wiping from the anterior to the posterior area prevents contamination of the vaginal opening. *(One wipe per towelette.)*
♦ Put on sterile gloves appropriately	• Donning sterile gloves must be accomplished by using aseptic technique. Either single or double glove technique is acceptable.
♦ Drape mother and establish a sterile field around vaginal area	• Draping the mother maintains a clean field and provides some modesty for the mother. Use the drapes provided in the OB kit. • Placing one towel under buttocks that can be removed in case of fecal contamination is recommended (have additional towels readily available).

PROCEDURE

Skill Component	Key Concepts
♦ Apply gentle pressure to perineum when crowning is present	• Applying gentle pressure on the perineum may prevent tears and facilitate delivery of the head.

Skill Component	Key Concepts
♦ Support the newborn's head and to prevent explosive delivery: ***** Keep one hand on newborn's head***	• Supporting the newborn's head by spreading fingers evenly around the head to (like cupping the head) prevents concerted pressure on fontanelles. • An explosive delivery causes perineal tears and can result in harm due to the sudden change in pressure to the newborn's head.
♦ Rupture the amniotic membranes and pull membranes from newborn's mouth and nose - *if not ruptured previously* ***** Note color and odor of amniotic fluid - if membranes were not ruptured previously***	• The method used to cause rupture of the membranes is to pinch the membranes between fingers and twist until the membranes tear. DO NOT use an instrument to rupture membranes since this may cause injury to the presenting part. • Amniotic fluid that is greenish or brownish-yellow (meconium) indicates fetal distress. Cloudy or foul smelling fluid indicates an infection.
♦ Once the head is delivered: • Check for nuchal cord around the newborn's neck as soon as head is delivered: ***** If no nuchal cord - continue with delivery*** ***** If nuchal cord - loosen cord with 2 fingers and slip over newborn's head and if necessary - clamp in 2 places approximately 2" apart and cut the cord***	• Instructing the mother NOT to push at this point prevents tightening of the cord around the newborn's neck. • The procedure for removing the cord from around the newborn's neck include placing two (2) fingers under the cord at the back of the newborn's neck and gently bringing the cord forward and over the head. • If the cord cannot be loosened, clamp the cord in 2 places about 2" apart and carefully cut between the clamps. Unwrap the cord from the neck and continue with the delivery.
♦ Assist in delivering the shoulders: • Upper shoulder - guide head downward - *if necessary* • Lower shoulder - guide head upward - *if necessary*	• The newborn's head must be supported between both hands throughout the procedure.
♦ Perform a McRoberts maneuver - if unable to deliver the anterior shoulder (shoulder dystocia) - Hyper-flex the mother's legs tightly to her abdomen - Applies pressure on the mother's lower abdomen (suprapubic) while gently pulling downward on the neonate's head – if flexing the knees was ineffective	• McRoberts maneuver is used to assist with the delivery of the anterior shoulder. Shoulder dystocia may occur when the infant is proportionately too large to proceed through the mother's pelvis. The shoulders become lodged in the birth canal. • Hyper-flexion of the mother's legs is accomplished by bending the mother's knees and gently moving her thighs tightly into her abdomen. This causes the mother's pelvis to rotate and facilitates the delivery of the anterior shoulder of the neonate. • If hyper-flexion is unsuccessful, apply suprapubic pressure on the mother's lower abdomen (suprapubic) while gently pulling on the neonate's head. • McRoberts technique is about 40-50% successful.
♦ Assist in delivering the rest of the newborn and note the gender and time of delivery	• As the feet are delivered, grasp them to assure a good hold on the newborn and note the time of birth.
♦ Hold newborn securely: ***** Support the head*** ***** Keep at the level of the mother's perineum (vagina)***	• The newborn must be kept at the level of the perineum until the cord is cut to prevent critical exchange of blood flow: - above perineum – siphons the blood from the newborn back into the placenta resulting in the newborn becoming hypovolemic. - below the perineum – provides too much blood to the newborn and may result in the newborn becoming fluid overloaded.
♦ Place the neonate on the mother's abdomen	• Placing the neonate on the mother's abdomen facilitates "skin to skin" contact and assists in maintaining the body temperature of the neonate.

Skill Component	Key Concepts
♦ Wipe the newborn's mouth and nose	
♦ Clear the newborn's airway with bulb syringe - ***only if there are signs of obstruction:*** • Sternal retractions • Gasping • Stridor • Excessive gurgling • Choking • Apnea *****If there are signs and symptoms of obstruction:*** • Suction the mouth 2 - 3 times • Suction each nostril 1 - 2 times	• Routine suctioning of the neonate is no longer recommended because it may stimulate the vagus nerve and cause bradycardia. Suctioning is **ONLY recommended if** If there are obvious signs of airway obstruction. • Drying and tactile stimulation is usually sufficient to stimulate respirations. • Aspiration of meconium stained amniotic fluid may cause pneumonia or other breathing problems. The American Heart Association (AHA) no longer recommends routine suctioning even if meconium is present. • Newborns are obligate nose breathers until approximately 6 months of age. • If suctioning is required: - Suction the mouth first to prevent the newborn from aspirating any accumulated fluid from the mouth and pharynx which may cause pneumonia or other respiratory complications. - Avoid suctioning deep into the oropharynx, as this will result in an exaggerated vagal response and subsequent bradycardia. • The bulb syringe must be compressed before it is inserted into the mouth and nose to prevent injecting air or fluid. • The bulb syringe is inserted approximately 1-1.5" into the mouth and no more than 0.5" into the nostrils. Slowly release the bulb to draw fluid into the syringe and discharge the contents into a towel.
♦ Stimulate the newborn to breathe - *if necessary* • Vigorously rub the back with a towel ***** Ventilate newborn with bag-valve-mask - if no response after 5-10 seconds of stimulation***	• If a newborn does not respond to stimulation and remains apneic or in persistent respiratory distress.
♦ Double clamp umbilical cord - *if not clamped previously* • 1st clamp – 4 inches from newborn • 2nd clamp – 2 inches or from the 1st clamp above the first clamp (4 – 6 inches from the newborn)	• The newborn may be placed on sterile surface near the level of the perineum, while clamping and cutting the cord. • Make sure the clamps are secure and will not slip off. If this occurs the newborn and/or mother may hemorrhage. • In the case of an enlarged umbilical cord, use ties. • The current recommendation is to wait approximately 1-3 minutes after delivery to clamp the cord to improve the iron status of the newborn.
♦ Cut the cord carefully in-between the clamps • Use approved clamps and cutting device following manufacturer's directions	• The cord should be cut with the device provided in the OB kit. If no device was in the kit, use your own scissors (wiped down with a disinfectant) to cut the cord.
♦ Dry and wrap the newborn in a blanket or towel ***** Wrap newborn only in a dry blanket or towel to preserve the body temperature and position the neonate on his/her side***	• Newborns become hypothermic very rapidly. This can precipitate hypoglycemia, respiratory problems, increased oxygen demand, and bradycardia. • The infant's head and entire body must be covered so that only the face is exposed. The neonate's head is the most common source of heat loss.
♦ Direct assistant to monitor and complete initial care of the newborn	• If you are a lone rescuer, place newborn on its side with head slightly lower than the trunk or give the newborn to the mother to hold, if she is able. • If the mother chooses to breast feed, put newborn to breast. Sources differ as to whether suckling helps in placental separation and expulsion or it has a neutral effect. However,

	breastfeeding and close contact assists in mother/infant bonding.
Skill Component	**Key Concepts**
♦ Assess mother's vital signs and check for vaginal bleeding	
♦ Verbalize the signs of placental separation: • Lengthening of the umbilical cord • Gush of blood from the vagina • Contraction of the uterus (raises into a globular shape)	• Lengthening of the umbilical cord indicates that the placenta is separating from the uterine wall. Usually takes about 5 - 20 minutes or longer. • The gush of blood is from the placental separation mixed with amniotic fluid.
♦ Prepare for delivery of the placenta: • Have basin ready to receive placenta • Expect a gush of blood after placenta is delivered	• Pulling on the umbilical cord may result in hemorrhage, an inverted uterus, or retained membranes. • Transport should **NOT BE** delayed if the placenta has not delivered. Delivery of the placenta may take up to 30 minutes. Transport as soon as the mother and newborn are stabilized. • Normal blood loss during a deliver is up to 500 mL. (1-2 cups).
♦ Deliver the placenta: • Have mother bear down • Grasp the placenta when it appears at the vaginal opening - DO NOT pull on cord • Guide the placenta and membranes from the vaginal opening into basin or towel ** ***Check (inspect) for integrity of the placenta and cord***	• Rotating the placenta gently helps in separate it from the uterine wall, but do not pull on the cord. • A normal placenta is about 7" in diameter and 1" thick. It has a smooth side (uterine side) and a rough side (fetal side) and divided into lobes. • Retained placental fragments (pieces of the placenta or membranes) will cause persistent bleeding and may require surgical intervention.
♦ Place the placenta into a labeled plastic bag and transport with mother	• After the placenta has been inspected, it should be placed in plastic bag and transported to the hospital with the mother and newborn. • The hospital personnel must be informed if the placenta and cord do not appear to be intact.
♦ Check for perineal lacerations and apply pressure to control bleeding - *<u>if necessary</u>* ***If the perineal tears are actively bleeding, apply pressure to control the bleeding with a gloved hand.*	• If there is a perineal tear, inform the mother that this will be treated by the physician in the hospital
♦ Remove soiled drapes and other contaminated waste in appropriate bag	
♦ Place obstetrical pad(s) or large dressing over the perineal area: • Touch only the outer surface of the pads • Place pads from vagina down towards the mother's anus. • Assist mother in putting thighs together to hold pads in place	• Placing the absorbent side of the obstetrical pads toward mother, over the perineal area from the vagina down toward the anus prevents contamination of perineal lacerations and the vaginal area and acts as a method for assessing for abnormal bleeding. • If the OB kit does not contain OB pads, use folded abdominal dressings
♦ Assess the fundus of the uterus every 5 minutes and perform fundal massage - *<u>if indicated</u>:* • Place one hand above pubic bone • Place other hand above contracted uterus • Massage (knead) firmly over area using a circular motion until the uterus is firm	• Fundal massage is indicated if there is postpartum hemorrhage or the uterus has not contracted. Inform mother that this procedure is painful, but necessary, to control the bleeding. • Procedure for performing <u>fundal massage</u>: - place the medial aspect of the little finger and palm of the hand above the public bone and inferior part of the uterus - cup the other hand above the superior aspect of the uterus - use the flat of the 4 fingers of the cupped hand and massage the uterus in a circular motion until the uterus is firm

Skill Component	Key Concepts
♦ Provide comfort and support to the mother and transport	• The mother will chill easily after giving birth due to decreasing blood volume. Cover her with a blanket for warmth. • The mother and newborn should be transported to the same facility. • BLS units shall call for an ALS unit or transport to the most appropriate hospital.
♦ Dispose of contaminated equipment using approved technique	

REASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
§ Repeat an ongoing assessment every **5 minutes if priority patient** or 10-15 minutes if they are stable. • Primary assessment • Relevant portion of the secondary assessment • Vital signs ***Manage patient condition as indicated.**	• Patients who deliver outside of the hospital (in the field setting) may be considered "priority patients. Priority patients have abnormal vital signs or S/S of poor perfusion. Additionally, if you suspect that the patient's condition may deteriorate, reassess the patient every five (5) minutes. • Evaluating and comparing results assists in identifying if the patient's condition is improving, or deteriorating.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Verbalize/Document: • Time of delivery of newborn and placenta • LMP and/or EDD • Problems with this pregnancy • Vaginal discharge • Gravida, para (number of pregnancies and live births) • Type of previous deliveries - *if indicated* • Estimated blood loss • Integrity of the placenta and cord • Condition of the newborn • Fundal massage - *if provided* • Presence of meconium	• Two EMS forms are necessary, one for the mother, and one for the newborn (2 patients). • Time of delivery for the newborn is the time when the newborn's body is delivered. • Time of delivery for the placenta is when it passes out of the vagina • Documenting reassessment information provides a comprehensive picture of patient's response to treatment. • The last reassessment information (before patient care is transferred) should be documented in the appropriate section of the EMS form. • Documentation must be on either the Los Angeles County EMS Report, departmental Patient Care Record form or ePCR.

Developed: 12/01 Revised: 10/2017

OBSTETRICAL EMERGENCY / EMERGENCY CHILDBIRTH
DELIVERY
Supplemental Information

DEFINITIONS:

- Age of viability – is the ability of a fetus to survive outside the uterus, usually 20 weeks. With advances in technology, premature infants are surviving younger and younger.
- Reference No. 511 – Perinatal Patient Destination pertains to patients who are at least 20 weeks pregnant.
- *Bloody show* – watery bloody discharge is normal through out the three stages of labor. During the 1st stage of labor it is the displacement of the mucus plug as the cervix dilates
- *Boggy uterine fundus* – also called uterine atony meaning that the uterus does not contract and not constricting the blood vessels at the site of placental separation from the uterine wall. This may result in postpartum hemorrhage. The fundus feels soft and squishy.
- *Crowning* – bulging of the vaginal opening; when the presenting part of the newborn is visible. This is the most reliable sign of imminent delivery
- *Duration of the contraction* – time from the beginning of the contraction to its completion
- *Frequency of contractions* – time from the beginning of one contraction until the onset of the next contraction
- *Full term* – 38-42 weeks gestation
- *Fundal massage* – is massaging the fundus to make it firm to stop postpartum hemorrhage.
- Gestational age – Gestational age (the age of the fetus) is calculated from the first day of the mother's last menstrual period. Since the exact date of conception is almost never known, some believe it may be anywhere from 11 - 21 days after the onset of woman's last menstrual period.
- *Labor* – pain and discomfort of the contractions, usually felt in the lower abdomen and back
- *Meconium* – fetal feces is normally passed after the birth of the newborn. However, during periods of fetal stress, defecation may occur prior to delivery. Meconium stools are green and tarry. Current practice does not call for aggressive suctioning, only suction if airway is obstructed.
- *Nuchal cord* – umbilical cord wrapped around newborn's neck
- Signs of airway obstruction or respiratory distress - choking, gasping, coughing, grunting, inspiratory stridor, apnea, retractions, etc.
- Spontaneous abortion (miscarriage) – this is the spontaneous loss of a fetus before the 20th week of pregnancy
- Therapeutic abortion – is the intentional termination of a pregnancy before the fetus can live independently
- Uterine inversion – uterus is inverted or "turned inside-out". This is caused by extensive pressure on the uterus or from pulling on the umbilical cord before the placenta is delivered.

Developmental Terminology
• *Fetus* – 3 - 40 weeks gestation in utero
• *Newborn* - neonate in the first minutes to hours after birth
• *Neonate* - first month after birth (28 days)
• *Infant* - includes the neonatal period to 1 year (12 months)
Reproductive History
• *Gravida* - current and all past pregnancies
• *Para* - The number of live births

OBSTETRICAL EMERGENCY / EMERGENCY CHILDBIRTH
DELIVERY
Supplemental Information (Continued)

COMPLICATIONS AND INTERVENTIONS:

- **Meconium-stained amniotic fluid**

  Problem - may cause sepsis, pneumonia, or other respiratory problems
  Intervention: Current practice does not call for aggressive suctioning, only suction if airway obstructed.

- **Nuchal cord**

  Problem - will may choke the newborn as the head is delivered. The cord may tear during the delivery causing severe hemorrhage in the newborn and mother
  Intervention - slip the cord around neck or double clamp and cut cord if unable to slip it over the newborn's head

- **Shoulder Dystocia**

  Problem – unable to deliver the infants anterior (top) shoulder
  Intervention - Perform a McRoberts maneuver - if unable to deliver the anterior shoulder (shoulder dystocia)

  - Hyper-flex the mothers' legs tightly to her abdomen
  - Applies pressure on the mother's lower abdomen (suprapubic) while gently pulling downward on the neonate's head – if flexing the knees was ineffective

STAGES OF LABOR:

- **The three stages of labor are:**

  1st stage (dilation stage) - Starts with regular contractions and thinning and gradual dilation of the cervix
  Ends with complete dilation of the cervix

  2nd stage (expulsion stage) - Starts with newborn entering the birth canal
  Ends with the delivery of the newborn

  3rd stage (placental stage) - Starts with the delivery of the newborn
  Ends with the delivery of the placenta

- **Contraction pattern:**

Latent (early) phase of 1st stage of labor	Active phase of 1st stage of labor
> frequency – every 15-30 minutes	> frequency – every 2-3 minutes
> duration – 30-40 seconds	> duration – average 60 seconds
> intensity – mild	> intensity – moderate to strong

ABNORMAL DELIVERIES:

- **Prolapsed cord**

  Problem - cord presents through the birth canal before delivery of the head. This serious emergency endangers the life of the unborn fetus.
  Intervention:
  - Administer high flow oxygen to the mother to increase oxygen delivery to fetus
  - Elevate mother's pelvis on a pillow or inverted bed pan to reduce pressure on cord
  - Elevate presenting part of the newborn off the cord to prevent compression of the cord and maintain fetal circulation
  - Cover cord with sterile moist dressings to minimize temperature change and reduce umbilical artery spasm

- **Premature birth**

  Problem – newborn is delivered prior to 38 weeks gestation. The newborn is more susceptible to respiratory problems, infections, and hypothermia
  Intervention:
  - Keep newborn warm
  - Avoid contamination from birth process and DO NOT breath into newborn's face
  - Administer positive-pressure ventilation if newborn remains apneic or give supplemental oxygen by blow-by method if in respiratory distress

- **Multiple births**

  Problem - generally both babies are delivered normally, however about 1/3 of the second babies are breech
  Intervention:
  - When the 1st newborn is born, clamp and cut the cord to prevent hemorrhage to the 2nd newborn
  - If the 2nd newborn has not delivered within 10 minutes of the 1st, transport immediately
  - Deliver the placenta(s) or transport if not delivered when mother and babies are stabilized and ready for transport

OBSTETRICAL EMERGENCY / EMERGENCY CHILDBIRTH
DELIVERY
Supplemental Information (Continued)

- **Breech presentation**

  Problem - newborn's feet or buttocks appear first instead of the head. Every attempt should be made to transport to the hospital. (It is common to have meconium in amniotic fluid with breech presentation)

  Intervention:
  - Administer oxygen to the mother to increase oxygen delivery to the fetus
  - Let delivery proceed
  - If the head does not deliver within 3 minutes
    - form an airway for the newborn by placing the middle and index fingers along the infant's face
    - hold the vaginal wall away from the newborn's nose and mouth
    - hold newborn's mouth open slightly with finger so that newborn can breathe
    - transport rapidly

- **Limb presentation**

  Problem - an arm or leg appears first instead of the head.

  Intervention:
  - Administer oxygen to the mother to increase oxygen delivery to the fetus
  - Elevate mother's pelvis on a pillow or inverted bed pan to reduce pressure on the newborn
  - Transport immediately - delivery is impossible

NOTES:

- Transport the mother and newborn to the same facility.
- BLS units shall call for an ALS unit or transport to the most appropriate hospital.
- APGAR score is an assessment of the newborn at 1 minute and 5 minutes after birth. The five parameters assessed are appearance, pulse, grimace, activity, and respirations.
- APGAR score is not required in Los Angeles County, but is found in all Emergency Childbirth literature and required in the National EMS Education Standards.
- In case of preterm or multiple births this may lead to a precipitous delivery (labor lasting less than 3 hours).
- If contractions are less than 2 minutes apart and the perineum is bulging or if crowning noted, deliver on scene.

Fundal Massage

The fundus (the upper part of the uterus) should be firm and midline. If it is boggy, this indicates the uterus is not firm and may lead to hemorrhage.

- Place the medial aspect of the little finger and palm of the hand above the public bone and the inferior part of the uterus
- Cup the other hand above the superior aspect of the uterus
- Use the flat of the 4 fingers of the cupped hand and massage the uterus firmly in a circular motion until the uterus is firm
- If the uterus is still not firm and leaning to the right side, this may indicate that the patient's bladder is full. Have the patient void, then recheck the fundus and start fundal massage again until firm. If the uterus remains boggy, transport immediately.
- The mother may be resistant to having this procedure done since it is painful. Reassure her that it is necessary to control the bleeding.

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

OBSTETRICAL EMERGENCY / EMERGENCY CHILDBIRTH
NEONATAL ASSESSMENT & RESUSCITATION

PERFORMANCE OBJECTIVES
Demonstrate proficiency in assessing the newborn and performing initial care and interventions as necessary.

CONDITION
Assess and perform the initial care of the newborn and intervene as necessary using a simulated patient. Necessary equipment will be adjacent to the manikin or brought to the field setting.

EQUIPMENT
Newborn manikin with umbilical cord clamped, bulb syringe, baby blankets, oxygen tank with flow meter, oxygen tubing, neonatal oxygen mask, neonatal bag-valve-mask device, stethoscope, eye protection, masks, gown, gloves.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) should be practiced.
- Ventilations and compressions must be at least at the minimum rate required.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation (BSI) precautions	• Mandatory personal protective equipment – gloves
♦ Evaluate additional BSI needs	• Situational - eye protection, masks, gown
♦ Determine: • Additional resources • Specialized equipment	

PROCEDURE	
Skill Component	**Key Concepts**
♦ Assess and support newborns body temperature: • Dry newborn completely - *if not done previously* • Keep wrapped in dry towel or blanket and keep head and body covered	• Newborns become hypothermic very easy, which can precipitate hypoglycemia, respiratory problems, increased oxygen demand, and bradycardia. • Wrapping the newborn's head and body so that only the face is exposed assists in maintaining the body temperature of the newborn as they lose most of their heat from their head.
♦ Assess and support the airway: • Position on back or side with neck in a neutral position • Suction with bulb syringe – ***only*** *if airway is obstructed*	• The normal respiratory and cardiovascular physiologic responses are expected to begin spontaneously within the first 15-30 seconds after birth • Hyperextension or flexion of neck may cause an airway obstruction. • Placing a newborn on their side with the neck slightly extended allow secretions to collect in the mouth and not in the posterior pharynx. • Aspiration of meconium stained amniotic fluid may cause pneumonia or other breathing problems. The American Heart Association (AHA) no longer recommends routine suctioning if meconium is noted unless an airway obstruction is present. • When suctioning with a bulb syringe: - make sure that the bulb syringe is compressed first before placing in the mouth and nose - place the syringe approx. 1"-1 1/2" into the mouth and no more than 1/2" into nostrils, slowly release the bulb drawing fluid into the syringe and discharge contents onto a towel.

D

Skill Component	Key Concepts
♦ Assess breathing and circulation: • **<u>IF PULSE < 120bpm and > 100bpm and breathing adequate or slow/shallow:</u>** - Continue to dry, warm and stimulate the newborn until newborn is vigorously crying. • **<u>IF PULSE < 100bpm OR poor respiratory rate, effort, or persistent central cyanosis:</u>** - Perform Bag Mask Ventilations (BMV) with room air for 90 seconds, squeeze the bag just enough to see chest rise then release; state "squeeze, release, release" to avoid hyperventilation. - Recheck pulse every 30 seconds. - For persistent poor respiratory rate, effort or central cyanosis, add high flow Oxygen 15L/min to BMV. • **<u>IF PULSE < 60bpm after BMV with high-flow Oxygen:</u>** - Begin chest compressions at a rate of 120/min, maintain 3:1 compression to ventilation ratio (90 compressions to 30 ventilations per minute); continue for 2 minutes before pulse check ***** Check pulse after initiating corrective action.***	• The heart rate is the most reliable indicator of the newborn's distress level. The normal newborn heart rate is 120-160/beats/minute. • Check pulse by one of the following: - auscultate apical pulse - palpate pulse at base of umbilical cord (fastest and easiest) - palpate brachial or femoral pulse • Stimulation is accomplished by gently rubbing the back with a towel or flicking the soles of the feet. • In a neonate that is not responding to treatment, ventilate for no longer than 90 seconds with room air before switching to ventilate with O_2 at 15L/minute. • All newborns are vulnerable to injuries to their eyes from high concentrations of oxygen, especially preterm infants and those who were resuscitated. • Respirations that are too fast or too slow result in insufficient breathing and oxygen delivery • For effective BM ventilations, the mask must have a tight seal. If an appropriately sized mask is not available, a larger mask may be used. Care should be taken to avoid excessive pressure over the eyes as this can result in bradycardia. • Using minimal inflation pressures assists with increasing and maintain heart rate > 100 beats/minute. Over-inflation causes gastric distention, which will decrease tidal volume by elevating the diaphragm and resulting in hypoxia. • Color is the least important indicator of adequate circulation. • The newborn must also be assessed for activity, pulse, grimace, appearance, and respirations (APGAR). • The APGAR score is determined at 1 minute and 5 minutes after birth. If the score is less than 7, repeat every 5 minutes for 20 minutes. • An APGAR score should not be attempted if the newborn requires resuscitation measures. • If resuscitation started on a newborn with obvious signs of fetal demise or gross deformities, BLS providers should continue resuscitative efforts during transport (unless Base contact can be made and orders are given to the contrary).
♦ Assess umbilical cord for: • Bleeding - apply sterile dressing and direct pressure - *<u>if indicated</u>* • Security of clamps or ties - use additional clamps or ties - *<u>if indicated</u>*	• Make sure clamps are secure and will not slip or the newborn may hemorrhage. • Use ties in case of an enlarged umbilical cord. • BLS units shall call for an ALS unit or transport to the most appropriate hospital.

REASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
♦ Continually reassess about every two (2) minutes • Breathing • Circulation • Warmth ***Manage newborn's condition as indicated.**	• Assess the newborn every two (2) minutes when the newborn shows S/S of poor perfusion and oxygenation, and if there is a suspicion that the newborn's condition may deteriorate. • Newborns are at high risk for hypothermia that can lead to bradycardia, respiratory distress, and hypoglycemia. Make every effort to keep the newborn warm. Increase the temperature in the ambulance and keep the newborn covered with only face exposed. • Re-evaluate the newborn at least about every 2 minutes if any treatment was initiated, medication administered or if a change in condition occurred or was anticipated • Evaluating and comparing results assists in recognizing if the newborn is improving, responding to treatment, or if their condition is deteriorating.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Verbalize/Document: • Time of delivery of newborn • Sex • Problems with this pregnancy • Presence of meconium • Integrity of the cord • Condition of the newborn • Initial and ongoing assessment • Treatment rendered • Response to treatment	• Time of delivery is the time when the newborn's body is delivered. • Documenting reassessment information provides a comprehensive picture of patient's response to treatment. • Last reassessment information (before patient care is transferred) should be documented in the appropriate section of the EMS form. • Documentation must be on either the Los Angeles County EMS Report form, the Departmental Patient Care Record, or ePCR.

Developed 12/01 Revised 10/2017

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

OBSTETRICAL EMERGENCY / EMERGENCY CHILDBIRTH
NEWBORN ASSESSMENT & MANAGEMENT

Supplemental Information

DEFINITIONS:

- *Central cyanosis* - bluish color on chest, abdomen, lips, and tongue
- *Inadequate respirations* – respirations that are too fast or too slow resulting in insufficient breathing and oxygen delivery
- *Infant* - includes the neonate period to 1 year (12 months)
- *Meconium* - fetal feces that is normally passed as the newborn's first bowel movement. However, during fetal or maternal stress, defecation may occur before birth
- *Newborn* - neonate in the first minutes to hours after birth
- *Neonate* - infants in first month after birth (28 days)
- *Oxygen administration* - administration of free-flow oxygen blow-by method:
  - mask - at least 5 Liters/minute, held loosely over newborn's mouth and nose
  - blow-by (free flow) with oxygen tubing or mask - at least 5 Liters/minute, held near the nostrils
- *Peripheral cyanosis* - bluish color limited to hands and feet
- *Poor perfusion* – *flaccid muscle done, weak cry, bradycardia (HR < 100 beats/minute), inadequate respirations (< 40 breaths/minute), and central cyanosis*

INDICATIONS FOR POSITIVE-PRESSURE VENTILATIONS:

- Apnea, gasping, or inadequate respirations
- Heart rate < 100 beats/minute

INDICATIONS FOR CARDIOPULMONARY RESUSCITATION:

- Pulseless
- Heart rate < 60 beats/minute after positive-pressure ventilation with oxygen for 30 seconds (1/2 minute)

NOTES:

- Newborns must make three rapid transitions to the outside world from their protected environment in utero:
  - Changing their circulatory pattern
  - Emptying fluid from their lungs and beginning ventilation
  - Maintaining body temperature
- Four main objectives in caring for the newborn:
  - Maintain warmth. Important to dry and wrap newborn with only face exposed, they lose most of their heat from the head.
  - Continually assess respirations, heart rate, and color.
  - Maintain adequate respirations by positioning, suctioning, administration of room air or oxygen, or ventilate with a BVM as indicated
  - Provide cardiac compressions for heart rate < 60 beats/minute after positive-pressure ventilation with oxygen for 30 seconds and no improvement.
- The mother and newborn should be transported to the same facility.
- BLS units shall call for an ALS unit or transport to the most appropriate hospital as per Reference No. 510, 511 and 808
- Signs of poor perfusion are weak cry, bradycardia (heart rate < 100 beats/minute), inadequate respirations (< 40 breaths/minute), and central cyanosis.
- Hyperextension or flexion of neck may cause an airway obstruction. To maintain airway position, place a folded blanket or towel under the neck and shoulders.
- If copious secretions are present, position the newborn on their side and slightly extend the neck. This allows the secretions to collect in the mouth and not in the posterior pharynx.
- If ventilating with a BMV, use *only* enough force to allow for good chest rise. Over-inflation causes gastric distention which will affect tidal volume by elevating the diaphragm
- If ventilating with a bag-valve-mask device ventilate with room air for > than 90 seconds and there is no response to treatment, switch to O_2 @ 15L/minute and re-evaluate after 30 seconds. (1/2 minute) The heart rate must be reassessed every 30 seconds (1/2 minute).
- For blow-by method hold tubing or mask 1/2" near the nose and mouth, but keep flow away from eyes since it can dry out the conjunctiva.
- Check pulse by one of the following:
  - auscultate apical pulse
  - palpate brachial or femoral pulse
- Normal newborn heart rate is 120-160 beats/minute.
- Compression to ventilation ratio is 3 compressions to 1 ventilation.

NEWBORN ASSESSMENT & MANAGEMENT

Supplemental Information (Continued)

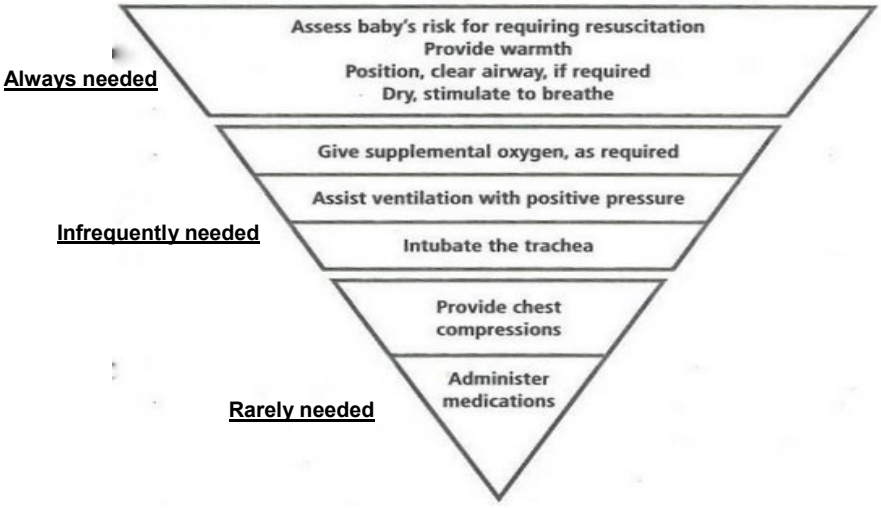
- *APGAR score is assessed at 1 minute and 5 minutes and if score is less than 7, it is repeated every 5 minutes for 20 minutes.*

DO NOT ASSESS APGAR IF RESUSCITATION MEASURES ARE NEEDED.

APGAR SCORE

Evaluation Factor	Findings	Score
Appearance (color)	- cyanotic or pale - blue hands and feet with pink body - extremities and trunk pink	0 points 1 point 2 points
Pulse	- no pulse - < 100/ minute - > 100/minute	0 points 1 point 2 points
Grimace (reflex irritability)	- no reflex to stimulation - slight reflex to stimulation - grimace, cough, sneeze, or cry in response to stimulation	0 points 1 point 2 points
Activity (extremity movement, degree of flexion and resistance to straightening them)	- limp, no extremity movement - some flexion with no movement - actively moving	0 points 1 point 2 points
Respirations	- no respiratory effort - slow, irregular effort with weak cry - good effort with strong cry	0 points 1 point 2 points
7-10 points = normal - provide routine care 4-6 points = moderately depressed - provide stimulation and oxygen 0-3 points = severely depressed - provide CPR and BVM ventilations		

The inverted pyramid reflects the frequencies for neonatal resuscitation



American Heart Association Pyramid
Neonatal Resuscitation

- **Always assess and manage:**
  Temperature (warm & dry)
  Airway (position & suction if indicated)
  Breathing (stimulate to cry if indicated)
  Circulation (heart rate & color)

COOLING MEASURES IN PEDIATRIC PATIENTS

Body temperature is monitored and regulated by the anterior hypothalamus which acts as a thermostat by altering the balance of heat production and heat loss via the sympathetic nervous system. Fever results when the thermoregulatory set point in the hypothalamus is shifted upward. Fever is initiated as part of the inflammatory response by interleukin-1 and prostaglandin E2.

Fevers are a natural physical reaction to infectious disease and bodily stress. It has been seen as both a symptom of infection and as a disease in and of itself. Theories for its control and eradication range from doing nothing (it helps fight the infection) to aggressive treatment to lower the temperature. High temperatures and how fast they raise are the underlying cause of febrile seizures. It has not yet been conclusively shown in the scientific literature whether the benefits of antipyretic (temperature reduction) therapy outweigh the risks in the treatment of the underlying cause.

Fever can be reduced by peripheral cooling (convection and evaporation being shown to be better than conduction), but because of the underlying physiology, the preferred treatment is with antipyretic medication. The medications indicated are aspirin (carries a high risk of Reyes Syndrome in pediatric patients), acetaminophen and ibuprofen. Prior to the development of these medications, physical cooling measures both active and passive were the only treatments available.

Active cooling involves the bathing or sponging with tepid water (ice cold water or alcohol should never be used). Passive cooling is defined as exposing skin to ambient temperatures. These measures are low cost and readily available, thus they were readily incorporated into the common sense, lay public treatment for fever.

In the prehospital setting, the limitations and risks of the use of medications resulted in using active and passive cooling measures as the 'standard of care for routine treatment of fever in children. However, active cooling measures may result in an increased discomfort level, hypothermia and shivering thus further compromising the condition of the pediatric patient. Unless antipyretic medications are given in conjunction with active cooling measures, the temperature may return and rise rapidly, possibly resulting in a febrile seizure. Therefore, due to the risks involved in using active cooling measure, these methods are discouraged in prehospital care and passive cooling, exposing the skin to air is the safest alterative.

Developed 2011 (JC), Revised 2015 (etr)

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

EMS SKILL

PATIENT ASSESSMENT
PEDIATRIC LENGTH BASED RESUSCITATION TAPE

PERFORMANCE OBJECTIVES
Demonstrate proficiency in the use of a Pediatric Length Based Resuscitation Tape to determine color code, weight, drug dosages, and size of equipment for a simulated pediatric patient.

CONDITION
Determine the weight, drug dosage (within their scope of practice), and/or correct size of equipment for a pediatric patient who is either in an upright or supine position using the Pediatric Length Based Resuscitation Tape. Necessary equipment will be adjacent to the patient or brought to the field setting.

EQUIPMENT
Simulated pediatric patient or infant/child manikin, Pediatric Length Based Resuscitation Tape, goggles, masks, gown, gloves.

PERFORMANCE CRITERIA
- Items designated by a diamond (♦) must be performed successfully to demonstrate skill competency.
- Items identified by double asterisks (**) indicate actions that are required if indicated.
- Items identified by (§) are not skill component items, but should be practiced.

PREPARATION	
Skill Component	**Key Concepts**
♦ Establish body substance isolation precautions	• Mandatory (minimal) personal protective equipment – gloves
♦ Place the patient in a position for measurement of body length and weight in kilograms (kg): • Supine **OR** • Upright	• Optimal position depends on the infant/child's condition and temperament. • Some children become extremely agitated if placed on their back, but are cooperative if allowed to stand. • If placed in a supine position, ensure the legs are straightened.
♦ Remove the tape from its outer package	• Use of a pediatric length-based resuscitation tape is required for pediatric patients (14 or <) in Los Angeles County per Reference Number 1309.
♦ Locate red end of tape labeled "Measure From This End"	
♦ Unfold the tape with the multi-colored strips and kg markings visible	• Tape should be facing up and forward (Kg side up)

PROCEDURE	
Skill Component	**Key Concepts**
♦ Place the red end of the tape body based upon the position of the patient. • Supine – Place red end at the top of head • Upright – Place the red end at the heel of the foot	
♦ Secure the red end of tape even with the starting point while unfolding tape and stop at the appropriate location: • Heel - if supine • Top of the head (crown)- if upright *****Run hand down the tape to smooth it out until it reaches either of the two (2) locations***	• Running your hand along the tape ensures the tape is not wrinkled. Wrinkled tapes **DO NOT** render accurate lengths and weights in kg. • Ensure the child's/infants legs are fully extended. • If the child is longer than the tape, stop, and use the appropriate technique for obtaining weight and size of equipment. • Place the infant supine and extend a leg to measure from the top of the head to the bottom of the heel.

♦ Read/Verbalize the colored block and zone that is even with the top of the head or at the bottom of the heel. • Color zone • Kg weight	• The stated weight given by caregiver may differ since the tape weight is based on lean body weight.
♦ Verbalize the reason why use of the Pediatric Resuscitation Tape is mandated by the Los Angeles EMS Agency Medical Director. • Used to determine the appropriate size of airway adjunct equipment • Used to determine the proper weight based drug doses for pediatric patients.	• Not all drugs or dosages used in prehospital care are noted on the tape. • **NEVER** guess the infant/child's color zone or weight in kg, without the use of the Pediatric Length Based Resuscitation Tape. This would not provide accurate equipment sizes or drug dosages that may be harmful to the patient. • The Pediatric Length Based Resuscitation Tape **SHALL** be used for all prehospital drug dosages - *if applicable and within the EMT scope of practice.*

RE-ASSESSMENT
(Ongoing Assessment)

Skill Component	Key Concepts
§ Keep the Pediatric Length Based Resuscitation Tape available for equipment or drug information - *if indicated*	• In the event that a stable patient deteriorates enroute, keep the Pediatric Length Based Resuscitation Tape accessible to ensure easy access.

PATIENT REPORT AND DOCUMENTATION

Skill Component	Key Concepts
§ Verbalize/Document: • Color zone • Kg in color zone	• The weight and color zone must be documented on the Los Angeles County EMS report form, departmental form, or ePCR. • Documentation must be on either the Los Angeles County EMS Report form or departmental Patient Care Record form.

Developed 11/99 Revised 6/2017

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

PATIENT ASSESSMENT

PEDIATRIC EMERGENCY RESUSCITATION TAPE

Supplemental Information

PURPOSE:

- To estimate the weight of pediatric patients for obtaining drug dosages and the correct equipment size for patients up to 36kg (79lbs).

INDICATION:

- All infants and children smaller or equal to length of tape.

NOTES:

- Pediatric resuscitation drugs for shock, hypoglycemia, opioid overdoses, or cardiac arrest are listed on the tape. Other emergency pediatric drugs are not listed. Use the "Color Code Drug Dosages – L.A. County Kids" color code chart for all emergency drug dosages.

Supine

Standing

Section 8:
EMS Operations

Learn the Facts

You should have a comprehensive understanding of:

- Anatomy & Physiology
- Conditions listed in the index
- Glossary words
- Medical terms listed in each chapter
- Pathophysiology

Understand the Concepts

You should have an extensive understanding of the following:

1. Agencies responsible for certification
2. Body Substance Isolation (BSI)
3. Definitive care
4. Do not resuscitate orders (DNR)
5. Documentation procedures
6. Elements of Incident Command System and Mass Casualty Incident (MCI)
7. Good Samaritan law
8. Health Insurance Portability and Accountability Act (HIPAA)
9. National Incident Management System (NIMS)
10. Procedures for EMS research
11. Reciprocity
12. START triage system
13. Techniques for decontamination

Perform the Skills

Finally, you should be able to:

1. Differentiate between libel and slander
2. Differentiate between online and standing orders
3. Differentiate between types of consent
4. Effectively communicate with family members
5. Evaluate the criteria for refusal of treatment
6. Evaluate the need for additional resources
7. Evaluate the need to gain access to a patient
8. Preserve a crime scene
9. Provide therapeutic communication
10. Recognize the need for scene safety procedures

PATIENT ASSESSMENT

1. Evaluate the ill or injured patient
2. Obtain diagnostic signs to include, but not limited to:
   a. respiratory rate
   b. pulse rate
   c. skin signs
   d. blood pressure
   e. level of consciousness
   f. pupil status
   g. pain
   h. pulse oximetry (if available)

RESCUE AND EMERGENCY MEDICAL CARE

1. Provide basic emergency care
2. Perform cardiopulmonary resuscitation (CPR)
3. Utilize mechanical adjuncts for basic CPR
   (requires EMS Agency approval)
4. Use a Public Access Automated External Defibrillator (AED)
   (carrying an AED requires EMS Agency approval as an AED Service Provider)
5. Administer oral glucose or sugar for suspected hypoglycemia
6. Apply mechanical patient restraints
   (per Reference No. 838)
7. Use various types of stretchers
8. Perform field triage
9. Extricate entrapped persons
10. Set up for ALS procedures under paramedic direction

AIRWAY MANAGEMENT AND OXYGEN ADMINISTRATION

1. Use the following airway adjuncts:
   a. oropharyngeal airway
   b. nasopharyngeal airway
   c. suction devices
2. Administer oxygen using delivery devices including, but not limited to:
   a. nasal cannula
   b. mask – nonrebreather, partial rebreather, simple
   c. blow-by
   d. humidifier
3. Use the following manual/mechanical ventilating devices:
   a. bag-mask ventilation (BMV) device
   b. continuous positive airway pressure (CPAP)
   (requires EMS Agency approval)
4. Ventilate advanced airway adjunc*ts via bag-device*:
   a. endotracheal tube
   b. perilaryngeal airway device (King LTS-D)
   c. tracheostomy tube or stoma
5. Suction:
   a. oropharynx
   b. nasopharynx
   c. tracheostomy tube or stoma

TRAUMA CARE

1. Provide initial prehospital emergency trauma care including, but not limited to:
   a. tourniquets for bleeding control
   b. hemostatic dressings
   (State EMSA approved dressings only]
   c. extremity splints
   d. traction splints
2. Use spinal motion restriction devices

ASSIST PATIENTS WITH PRESCRIBED EMERGENCY MEDICATIONS

1. Assist patients with the administration of their physician-prescribed emergency devices and medications to include but not limited to:
   a. Sublingual nitroglycerin
   b. Aspirin
   c. Bronchodilator inhaler or nebulizer
   d. Epinephrine device (autoinjector)
   e. Patient-operated medication pump

PATIENT TRANSPORT AND MONITORING BY AN APPROVED EMS PROVIDER

1. Transport and monitor patients in the prehospital setting and/or during an inter-facility transfer by an approved EMS Provider ***(Fire Department or a licensed Los Angeles County Ambulance Provider)***
2. Transport patients with one or more of the following medical devices:
   a. nasogastric (NG)
   b. orogastric tube (OG)
   c. gastrostomy tube (GT)
   d. saline/heparin lock
   e. foley catheter
   f. tracheostomy tube
   g. ventricular assist device (VAD)
   h. surgical drain(s)
   i. medication patches
   j indwelling vascular lines
      i. pre-existing vascular access device (PVAD)
      ii. peripherally inserted central catheter (PICC)
   k patient-operated medication pump
3. Monitor, maintain at a preset rate or turn off if necessary, the following intravenous (IV) fluids:
   a. glucose solutions
   b. isotonic balanced salt solutions (normal saline)
   c. ringer's lactate

ADDITIONAL THERAPIES REQUIRING APPROVAL BY THE LA COUNTY EMS AGENCY

EMS Providers ***(Fire Department or a licensed Los Angeles County Ambulance Provider)*** may apply for approval of select additional therapies and medications

Authority: California Code of Regulations, Title 22, Section 100063

Los Angeles County EMS Agency
Ref. No. 808.1 - BASE HOSPITAL CONTACT AND TRANSPORT CRITERIA
Field Reference

PRINCIPLES:

❶ Contact assigned base whenever possible.
❷ Clinical judgment should be exercised in situations not described in this policy.
❸ Children under three years of age require base hospital contact and/or transport in accordance with this policy.
❹ Thorough documentation is essential, especially if contact/transport is not performed in accordance with this policy **(* EXCEPTION, See SECTION III).**
❺ Circumstances may dictate immediate transport with base contact en route.
❻ EMTs shall not cancel a paramedic response if a patient meets any criteria in Section I; an ALS Unit shall be requested if one has not been dispatched.
❼ In life threatening situations, consider BLS transport if ALS arrival is longer than transport time.
❽ Contact shall be made with the area's trauma center, when it is also a base hospital, on all injured patients meeting Trauma Criteria and/or Guidelines.

SECTION I – BASE CONTACT REQUIRED

- Anaphylaxis
- Signs or symptoms of shock
- Cardiopulmonary arrest (excluding those meeting Ref. No. 814, 815)
- Chest pain or discomfort
- Shortness of breath and/or tachypnea
- PMC/PTC Criteria/Guidelines (Ref. No. 510)
- 5 or more patients requiring transport (contacting MAC constitutes base contact)
- Altered level of consciousness as defined in the Medical Control Guidelines
- Suspected ingestion of poisonous substance
- Exposure to hazardous materials with a medical complaint
- Abdominal pain pregnancy or suspected pregnancy ≥ 20 weeks gestation
- Hypertension (BP ≥140/90 mmHG) in pregnant patient ≥ 20 weeks gestation or post-partum patient (up to 6 weeks)
- Childbirth or signs of labor
- Suspected femur fracture
- Facial, neck, electrical, or extensive burns:
  20% or > in adults
  15% or > in children
  10% or > in infants
- Trauma Criteria/Guidelines (Ref. No. 506)
- Traumatic Crush Syndrome
- Syncope, loss of consciousness, acute neurological symptoms (suspected signs/symptoms of stroke)
- Refusal of transport (AMA), if meeting any criteria in Section I

SECTION II – TRANSPORT REQUIRED

- Abdominal pain
- Suspected isolated fracture of the hip
- Abnormal vaginal bleeding
- Suspected allergic reaction
- Asymptomatic exposure to hazardous material (If known to have delayed symptoms)
- GI bleeding
- Near drowning
- Patients who are gravely disabled or a danger to themselves or others

SECTION III – PEDIATRIC PATIENTS

- Infants ≤ 12 months of age shall be transported, regardless of chief complaint and/or mechanism of injury

  EXCEPTION: Infants ≤ 12 months of age who meet Ref. No. 814, Determination/Pronouncement of Death in the Field, Section I.

- Children 13-36 months of age require base hospital contact and/or transport except isolated minor extremity injury
- If a parent or legal guardian refuses transport (AMA), base contact is required prior to leaving the scene

  EXCEPTION: Ref. No. 808, Principle 4 does not apply to patients ≤ 36 months of age.

SECTION IV – REQUIRED BASE CONTACT CRITERIA FOR SFTPs

- If indicated in the SFTPs
- For any criteria listed in Section I that is not addressed by SFTPs
- Whenever consultation with the base hospital is Indicated

EMS REPORT

INCIDENT INFO

Date MM/DD/YYYY	Inc. # / Jur. Sta.	Location Code	MCI? ☐ Y ☐ N	PD & Unit #	☐ Regular Run ☐ No Pt ☐ Cx at Scene ☐ PuB Asst ☐ IFT ☐ DOA ☐ FireLine ☐ Pg 2

Inc Loc — Street Number — Street Name — Apt # — City Code — Incident Zip Code

Prov	A/B/H	Unit	Disp	Arrival	At Pt	Left	At Fac	Fac Equip	Avail	Team Member ID	
										#1	#2
										#3	#4
										#5	#6
										#7	#8

TRANS

Base	Protocol	Protocol	VIA	TRANS TO	RATIONALE
AMA? ☐ Y ☐ N		Rec.Fac.	☐ ALS ☐ BLS ☐ Heli ☐ No Transport	☐ MAR ☐ PeriNat ☐ EDAP ☐ STEMI ☐ TC/PTC ☐ PMC ☐ PrimAry Stroke Ctr. ☐ SART ☐ OTHER ☐ Comp. StroKe Ctr.	☐ No SC Req'd ☐ Criteria/Required ☐ Guidelines ☐ Judgment ☐ EXtremis ☐ No SC Access ☐ ED Sat ☐ Request by _____
Code 3? ☐ Y ☐ N					

PT INFO

Name/Last — First — M.I. — DOB / / — Phone ( )

Street Number — Street Name — Apt # — City — Zip — Mileage .

Insurance — Hospital ID — PMD Name — Partial SS # (last 4 digits)

COMMENTS

Hx

Allergies — ASA Allergy? ☐ Y ☐ N

Meds — SEDs in past 48hrs ☐ Y ☐ N

O / P

Q

R

S

T

COMPLAINTS

MEDICAL

☐ Abd/Pelvic Pain ☐ Agitated Delirium ☐ Allergic Reaction ☐ Altered LOC ☐ Apneic Episode ☐ BEHavioral ☐ Bleeding Other Site ☐ Brief Resolved Unexpl. Event ☐ Cardiac Arrest ☐ Chest Pain ☐ CHoking/Airway Obstr. ☐ Cough/Congestion ☐ DOA ☐ DYsrhythmia ☐ FEver ☐ Foreign Body ☐ GI Bleed ☐ Head Pain ☐ HYpoglycemia ☐ Local Neuro Signs ☐ Med Device Complaint ☐ Nausea/Vomiting ☐ Near Drowning ☐ Neck/Back Pain ☐ No Medical Complaint ☐ NOsebleed ☐ OBstetrics ☐ LAbor ☐ NeWborn ☐ OverDose ☐ POisoning ☐ Other Pain ☐ PalpitationS ☐ Respiratory Arrest ☐ SEizure ☐ Shortness of Breath ☐ SYncope ☐ VAginal Bleed ☐ WEak/DIzzy ☐ Inpatient Medical ☐ OTher _____

TRAUMA

☐ No Apparent Injury ☐ BURns/Elec. Shock ☐ SBP <90, <70 (<1yr) ☐ RR <10/>29, <20(<1yr) ☐ Susp. Pelvic FX ☐ Spinal Cord Injury ☐ Inpatient Trauma

B P ☐ ☐ Minor Lacerations

B P ☐ ☐ Traumatic Arrest ☐ ☐ Head ☐ GCS ≤14 ☐ ☐ Face/Mouth ☐ ☐ Neck ☐ ☐ Back ☐ ☐ Chest ☐ Flail Chest ☐ ☐ Tension Pneumo.

B P ☐ ☐ Abdomen ☐ Diffuse Abd. Tend. ☐ ☐ Genitals/ButtocKs ☐ ☐ Extremities ☐ EXt. ↑ knee/elbow ☐ FRactures≥ 2 long ☐ ☐ Amp.↑ wrIst/ankle ☐ ☐ Neur/Vasc/Mangl'd

MECHANISM

Protective Devices: ☐ Seat Belt ☐ Air Bag ☐ HeLmet ☐ Car Seat/Booster

☐ Enclosed Vehicle ☐ EJected ☐ EXtricated @ ☐ Pass. Space. Intr. ☐ >12" ☐ >18" ☐ Survived Fatal Accident ☐ Impact > 20 mph Unenclosed ☐ Ped/Bike Runover/Thrown/>20mph ☐ Ped/Bike < 20 mph ☐ FAll ☐ 15ft/>10ft. ☐ ASsault ☐ STabbing ☐ GSW ☐ Motorcycle/Moped ☐ SPorts/Recreation ☐ Self-Inflict'd/Acc. ☐ Self-Inflict'd/Int. ☐ AntiCoagulants ☐ Special Consid. ☐ Telemetry Data ☐ Hazmat Exposure ☐ ANimal Bite ☐ CRush ☐ ElectricalShock ☐ Thermal Burn ☐ Work-Related ☐ UNknown ☐ OTher:_____

IMPRESSION

☐ Cardiac Arrest Non-Trauma ☐ Obvious Death-DEAD ☐ SHOcK/Hypotension ☐ SEPSis ☐ HYPOglycemia ☐ HYPeRglycemia ☐ HYperTensioN ☐ CP- Susp. Cardiac ☐ CP-STEMI ☐ CP- Non Cardiac ☐ Cardiac DYSRhythmia ☐ PALPitations ☐ OverDose/POison/Ingestion ☐ Alcohol Intoxication-ETOH

☐ SEizure-ACtive ☐ SEizure-POstIctal ☐ ALOC (Not HYPO or SE) ☐ STRoKe/CVA/TIA ☐ DIZZiness/Vertigo ☐ Head Pain-Non Traumatic ☐ SYNCope/Near Syncope ☐ General WEAKness ☐ Epistaxis-NOseBLeed ☐ ALlergic Reaction(X) ☐ ANaPHylaxis ☐ DYstonic Reaction(X) ☐ NO Medical Complaint

☐ ShOrt of Breath-Bronchospasm ☐ Resp. Distress/Pulm Edema/CHFF ☐ Resp. Arrest-Resp. Failure ☐ Resp. Distress-OTher ☐ BRUE (ALTE) ☐ Airway Obstruction-CHOKing ☐ COld/FLu Symptoms ☐ Submersion/DRoWNing ☐ SMOKe Inhalation ☐ INHaLational Injury ☐ CarbOn MOnoxide ☐ Med. Device Malfunction-FAIL ☐ EXtremity Pain-Non Traumatic

☐ ABdOminal Pain ☐ NAusea/VoMiting ☐ UPper GI Bleeding ☐ LOwer GI Bleeding ☐ GenitoUrinary DisOrder ☐ DiarRHeA ☐ VAginal BLeeding ☐ PREGnancy Complication ☐ Pregnancy/LABoR ☐ ChildBiRTH (Mother) ☐ Newborn-BABY ☐ FEVeR ☐ STiNGs/Venomous Bites

☐ Behavioral/PSYCh Crisis ☐ AGitated DElirium ☐ TRauMAtic Injury ☐ Traumatic Arrest-Blunt CABT ☐ Traumatic Arrest-Penetr CAPT ☐ BURN ☐ Hazmat Skin Exposure-DCON ☐ ELeCTrocution ☐ EYE Problem-Unspecified ☐ ENT/Dental Problem-Unspecified ☐ HEAT- Hyperthermia Environ. ☐ Hypothermia/COLD Injury

PHYSICAL

PUPILS ☐ PERL ☐ PInpoint ☐ Sluggish ☐ Fixed & Dil. ☐ Cataracts ☐ Unequal ☐ Pt's Norm

RESP ☐ Normal ☐ Clear ☐ Wheezes ☐ Rales ☐ RHonchi ☐ SnorinG ☐ Unequal ☐ JVD ☐ Stridor ☐ Labored ☐ Apnea ☐ AMU — Tidal Volume ☐ N ☐ + ☐ -

SKIN ☐ Normal ☐ Diaphoretic ☐ Cyanotic ☐ Hot ☐ Flushed ☐ CoLd ☐ Pale — Cap Refill: ☐ NoRmal ☐ DElayed

12 LEAD

12 Lead Time: _____	2nd 12 Lead Time:_____
Software Interpretation: ☐ NL ☐ ABnl ☐ STEMI	Software Interpretation: ☐ NL ☐ ABnl ☐ STEMI
EMS Interpretation: ☐ NL ☐ ABnl ☐ STEMI	EMS Interpretation: ☐ NL ☐ ABnl ☐ STEMI
ArtiFact ☐ Y ☐ N	ArtiFact ☐ Y ☐ N
Wavy Baseline ☐ Y ☐ N	Wavy Baseline ☐ Y ☐ N
Paced Rhythm ☐ Y ☐ N	Paced Rhythm ☐ Y ☐ N
Transmitted? ☐ Y ☐ N	Transmitted? ☐ Y ☐ N

ARREST

Witness ☐ Citizen ☐ EMS ☐ None
☐ Citizen CPR ☐ Citizen AED
EMS CPR @ _____ (time)
Arrest to CPR _____ (min)
AED ☐ Analyze ☐ Defibrillation
☐ ALS Resuscitation (use pg 2)

Reason(s) for Withholding/Terminating Resuscitation:
☐ DNR/AHCD/POLST ☐ Termination Of Resuscitation
Time of 814 Death: _____
☐ RIgor ☐ LIvidity ☐ Blunt Trauma
☐ OTher _____
☐ FAmily _____ (signature)

SPECIAL CIRCUMSTANCES
DNR/AHCD/POLST? ☐ Y ☐ N Poison Control Contacted? ☐ Y ☐ N
Suspected: ☐ ETOH? ☐ Drugs? ☐ Abuse/Neglect
≥20wks IUP? ☐ Y ☐ N _____ wks
Barriers to Pt. Care: ☐ Speech ☐ Hearing ☐ Language
☐ Physical ☐ Other_____ Translator:_____

VITALS

Time	TM #	BP	Pulse	RR	O2 Sat	Pain	CO2	Time	TM #	Rhythm	Meds/Defib	Dose	Route	Result
		/												
		/												
		/												
		/												

Morphine Given: _____ mg Wasted: _____ mg

Midazolam Given: _____ mg Wasted: _____ mg

Fentanyl Given: _____ mg Wasted: _____ mg

Narcotic Wasted: RN Witness Name (print)_____ Signature _____

Reassessment After Therapies and/or Condition on Transfer:

Care Transferred To: ☐ Facility ☐ ALS ☐ BLS ☐ Heli	Transfer VS	Time	TM #	BP /	Pulse	RR	O2 Sat	CO2	Rhythm	CPAP Pressure	GCS E V M

Signature TM Completing Form
Sig #1 — Sig #2 — Reviewed By

Prefixes change mid order. Plant will put on. 000000

Orig. Seq.# _____

PATIENT ASSESSMENT

Pt ____ of ____ # Pts — Transported ____

Age_____ ☐ Y ☐ M ☐ W ☐ D ☐ H ☐ Est.

Gender ☐ M ☐ F

Weight _____ ☐ Lbs ☐ Kg

Peds Color Code ____ ☐ Too Tall

Distress Level ☐ None ☐ MilD ☐ Mod ☐ Severe

Pt Complaint 1 2 3 4

Prov Impress 1 2

Mechanism 1 2 3 4

GCS/mLAPSS/LAMS

Time		
Eyes		
Verbal		
Motor		
GCS Total		

Normal for Pt/Age ☐ Y ☐ N

mLAPSS ☐ Met ☐ Not Met

Last Known Well: ☐ Unk
Date: Time:

LAMS
Facial Droop: ____ Arm Drift:_____
Grip Strength: ____Total Score:___

THERAPIES TM#

☐ Back Blows/Thrust ____
☐ BVM ☐ CO2 _____ ____
☐ Breath Sounds ____
☐ Chest Rise ____
☐ Existing Trach ____
☐ OP/NP Airway ____
☐ Cooling Measures ____
☐ DRessings ____
☐ Ice Pack ____
☐ TourniQuet ____
☐ Hemostatic Dressing ____
☐ OX ____ lpm ☐ NC ☐ Mask ____
☐ REstraints ____
☐ Distal CMS Intact ____
☐ Spinal MotIon Restriction ____
☐ C-Collar ☐ BackboarD ____
☐ CMS Intact – Before ____
☐ CMS Intact – After ____
☐ SPlint ☐ Traction Splint ____
☐ SUction ____
☐ BLd Gluc #1____#2____ ____
☐ CPAP _____ cm H2O ____
Time: _____
☐ FB Removal ____
☐ IV _____ g _____ site ____
☐ I.O. _____ g _____ length ____
☐ Needle THoracostomy ____
☐ Vagal Maneuver ____
☐ TC Pacing ___ mA ___ bpm ____
Time: _____
☐ OTher _____ ____

Care Provided by PD:
☐ TourniQuet
☐ NarCan
☐ Hemostatic Dressing
☐ OTher

Total IV Fluids Received: _____ mls

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PROVIDER

PATIENT RELEASE

I hereby release: _____ EMS provider and
Por este acto relévio ***proveedor de asistencia y***
Hospital (if base contact made) from any _____
hospital de posibilidad de incurrir en demanda

liability of medical claims resulting from my refusal of emergency care and/or transportation to the nearest
medical resultado de mi denegación de tratamiento emergencia o transportacion a la clinica mas proxima. A mas

recommended medical facility. I further understand that I have been directed to contact my personal physician as to my
de esto, comprendo yo que me han dado instrucciones a communicar con mi medico privado de mi estato medical

present condition as soon as possible. I have received an explanation of the potential consequences of my refusal
tan pronto como es posible. Me han explicado la importancia de mi opcion y los resultados posible por mi denegacion.

Risks / Consequences: _____
Riesgos / Consequencias:

_____

_____

_____

Reason for refusal: _____
Mi argumento para denegar:

_____

Additional comments: _____
Mas comentos:

_____

Patient Signature ***Firma del Paciente***	Date ***Fecha***
Legal Representative ***Custodio Legal***	Relationship to Patient ***Parentesco al Paciente***
Witness 1 ***Presenciador***	Date ***Fecha***
Witness 2 ***Presenciador***	Date ***Fecha***

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Check all that apply:

- ☐ GCS = 15
- ☐ Advised of risks and consequences
- ☐ Interpreter used: Name: _____
- ☐ Patient has plans for follow up
- ☐ Advised to seek alternative medical care at once
- ☐ Understands consequences of refusal
- ☐ Instructed to recontact 911 if patient's condition deteriorates or patient reconsiders the need for 911 assistance

Refused: ☐ Treatment
☐ Transport

PED. GLASGOW COMA SCALE

EYE OPENING

Spontaneously	4
To speech	3
To pain	2
No opening	1

BEST VERBAL RESPONSE

Smiles, tracks objects	5
Cries but consolable	4
Inconsistently inconsolable, moaning	3
Inconsolable, agitated	2
No response	1

BEST MOTOR RESPONSE

Spontaneous or purposeful	6
Withdraws from touch	5
Withdraws from pain	4
Abnormal flexion	3
Abnormal extension	2
No response	1

NORMAL PEDIATRIC VITAL SIGNS

	Heart Rate	Resp Rate
Infant	100-180	30-60
Toddler	80-110	24-40
Preschooler	70-110	22-23
School-age	60-110	18-30

Normal Blood Pressure can be estimated:
90 + (2x age in years) = Systolic BP

PEDIATRIC AGE / ASSESSMENT

PRINCIPLES:

1. Pediatric patients require special consideration in assessment, treatment and administration of medication.
2. The treatment and concentration of medications are age or weight specific for the pediatric patient.
3. For purposes of destination, pediatric patients in the prehospital setting are defined as children **14 years of age or younger**.
4. Brief Resolved Unexplained Event (BRUE) is defined as an event occurring in an infant <1 year of age when the observer reports a sudden, brief, and now resolved episode of 1 or more of the following:
   - Cyanosis or pallor
   - Absent, decreased, or irregular breathing
   - Marked change in tone (hyper - or hypotonia)
   - Altered level of responsiveness

GUIDELINES:

1. A Pediatric Resuscitation Tape shall be used to obtain the patient's weight and treatment color code on all ALS pediatric patients. Pediatric patients < 12 years or height greater than the length of the pediatric tape, who require ventilatory support will be managed with BLS measures as indicated.
2. A King LTS-D may be used for pediatric patients ≥ 12 years of age.
   - Small Adult (Height between 4 feet and 5 feet)
   - Adult (Height between 5 feet and 6 feet)
   - Large Adult (Height 6 feet and taller)
3. Child CPR is used for patients from 1 year of age to the onset of puberty..
4. Infant CPR is used for patients 2-13 months.
5. Neonatal CPR is used for patients newborn to 1 month of age.
6. AED may be used for all children. Pediatric pads are recommended for infants and children <8 years of age. For children ≥ 8 years of age, use a standard AED.

ECG CODES

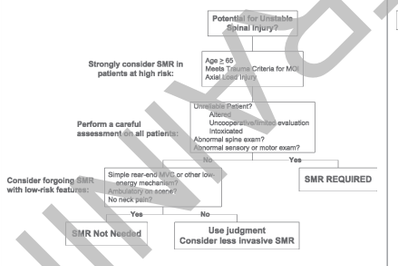
AFI	Atrial Fibrillation	PAC	Premature Atrial Contrac
AFL	Atrial Flutter	PAT	Paroxysmal Atrial Tach
AGO	Agonal Rhythm	PEA	Pulseless Elec Activity
ASY	Asystole	PST	Paroxysmal Supravent Tach
AVR	Accelerated Ventricular	PVC	Premature Ventric Contrac
1HB	1-Heart Block	SR	Sinus Rhythm
2HB	2-Heart Block	SB	Sinus Bradycardia
3HB	3-Heart Block	ST	Sinus Tachycardia
IV	Idioventricular	SVT	Supraventricular Tach
JR	Junctional Rhythm	VF	Ventricular Fibrillation
PM	Pacemaker	VT	Ventricular Tachycardia

Monitoring Principles:

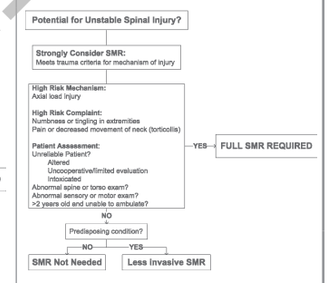
1. Any patient placed on a cardiac monitor should remain on the monitor until care is transferred.
2. Any patient that requires a monitor should have a 6 second strip attached to the original and receiving facility copies of the EMS Report Form.

SPINAL MOTION RESTRICTION

ADULT



PEDS



MEDICATIONS / DEFIBRILLATION

Medications:

ADE	Adenosine
ALB	Albuterol
AMI	Amiodarone
ASA	Aspirin
ATR	Atropine
BEN	Benadryl
BIC	Sodium Bicarbonate
CAL	Calcium Chloride
D10	10% Dextrose
D25	25% Dextrose
D50	50% Dextrose
DOP	Dopamine
EPI	Epinephrine
P-EPI	Push-dose Epinephrine
FEN	Fentanyl
GLU	Glucagon
GLP	Oral Glucose Paste
MID	Midazolam
MORPHINE	Morphine Sulfate
NAR	Narcan
NTG	Nitroglycerin
OND	Ondansetron

Medications Routes:

IM	Intramuscular
IN	Inhaled/Inhalation/Intranasal
IO	Intraosseous
IV	Intravenous
PB	Piggyback
PO	By Mouth/ODT
SL	Sublingual
SQ	Subcutaneous

Dose:

FC	Fluid Challenge
TKO	To Keep Open
WO	Wide Open

Defibrillation:

CAR	Cardioversion
DEF	Defibrillation
TCP	Transcutaneous Pacing

IV Access: (Chart as medication)

NS	Normal Saline
SL	Saline Lock
IVU	IV Unobtainable

GLASGOW COMA SCALE

EYE OPENING

Spontaneously	4
To Verbal Command	3
To Pain	2
No Response	1

BEST VERBAL RESPONSE

Oriented	5
Confused	4
Inappropriate Words	3
Incomprehensible Sounds	2
No Response	1

BEST MOTOR RESPONSE

Obedient	6
Purposeful	5
Withdrawal	4
Flexion	3
Extension	2
No Response	1

Modified Los Angeles Prehospital Stroke Screen (mLAPSS)

MODIFIED LAPSS CRITERIA

1. Symptoms less than 6 hours duration
2. No history of seizures or epilepsy
3. Age equal to or greater than 40 years
4. At baseline, not wheelchair bound or bedridden
5. Blood glucose between 60 and 400 mg/dl
6. Motor Exam: Examine for obvious asymmetry (positive if one or more of the following is met)
   a. Facial Smile/Grimace
   b. Grip
   c. Arm Strength

Los Angeles Motor Scale (LAMS)

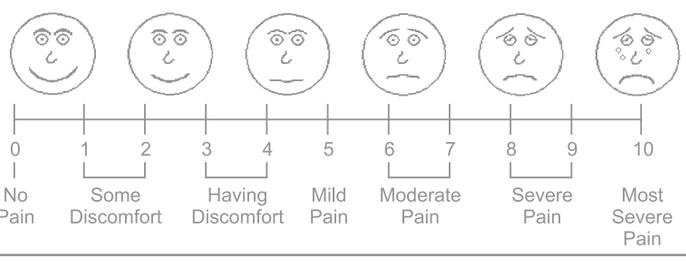
1. Facial Droop
   a. Absent = 0
   b. Present = 1
2. Arm Drift
   a. Absent = 0
   b. Drifts Down = 1
   c. Falls Rapidly = 2
3. Grip Strength
   a. Normal = 0
   b. Weak Grip = 1
   c. No Grip = 2

Total LAMS Score = Sum of assessments 1-3

FLACC (Face, Legs, Activity, Cry and Consolability) (< 3 yrs or with cognitive impairment)

	Behavior	0	1	2
F	Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant frown, clenched jaw, quivering chin
L	Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
A	Activity	Lying quietly, normal position, moves easily	Squirming, tense, shifting back and forth, hesitant to move, guarding	Arched, rigid or jerking, fixed position, rubbing of body part
C	Cry	No cry/moan (awake or asleep)	Moans or whispers, occasional cries, sighs or complaint	Cries steadily, screams, sobs, moans, groans, frequent complaints
C	Consolability	Calm, content, relaxed, needs no consoling	Reassured by hugging, talking to, distractible	Difficult to console or comfort

PAIN SCALE (Document on all patients complaining of pain and after all medications for the relief of pain)



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RECEIVING FACILITIES

(Base Hospitals are noted in Bold)

ACH Alhambra Hospital Medical Center
AHM Catalina Island Medical Center
AMH Methodist Hospital of Southern California
ANH Anaheim Memorial Medical Center
ARM Arrowhead Regional Medical Center (SB County)
AVH Antelope Valley Hospital
BEV Beverly Hospital
BMC Southern California Hospital at Culver City
CAL California Hospital Medical Center
CHH Childrens Hospital Los Angeles
CHI Chino Valley Medical Center (San Bernardino Co)
CHO Children's Hospital of Orange County (Orange County)
CHP Community Hospital of Huntington Park
CNT Centinela Hospital Medical Center
CPM Coast Plaza Doctors Hospital
CSM Cedars-Sinai Medical Center
DCH PIH Health Hospital - Downey
DFM Marina Del Rey Hospital
DHL Lakewood Regional Medical Center
DHM Montclair Hospital Medical Center (San Bernardino Co)
ELA East Los Angeles Doctors Hospital
ENH Encino Hospital Medical Center
FHP Fountain Valley Hospital (Orange County)
FHR Friendly Hills Regional Medical Center (Orange County)
FPH Foothill Presbyterian Hospital
GAR Garfield Medical Center
GEM Greater El Monte Community Hospital
GMH Glendale Memorial Hospital/ Health Center
GSH Good Samaritan Hospital
GWT Glendale Adventist Medical Center
HCH Providence Holy Cross Medical Center
HEV Glendora Community Hospital
HGH LAC Harbor-UCLA Medical Center
HMH Huntington Hospital
HMN Henry Mayo Newhall Hospital
HWH West Hills Hospital and Medical Center
ICH Citrus Valley Medical Center-Intercommunity Campus
KFA Kaiser Foundation - Baldwin Park
KFB Kaiser Permanente Downey Medical Center
KFF Kaiser Foundation Hospital Fontana (San Bernardino Co.)
KFH Kaiser Permanente South Bay Medical Center
KFI Kaiser Permanente Irvine Medical Center (Orange Co)
KFL Kaiser Permanente Los Angeles Medical Center
KFN Kaiser Foundation - Ontario (San Bernardino Co)
KFO Kaiser Permanente Woodland Hills Medical Center
KFP Kaiser Permanente Panorama City Medical Center
KFW Kaiser Permanente West LA Medical Center
KHA Kaiser Foundation Hospital Anaheim (Orange Co.)
LAG Los Alamitos Medical Center (Orange Co)
LBC Community Hospital of Long Beach
LBM Long Beach Memorial Medical Center
LBV Long Beach VA (NON-BASIC)
LCH Palmdale Regional Medical Center
LCM Providence Little Company of Mary Torrance
LLU Loma Linda University Medical Center (San Bernardino Co)
LPI La Palma Intercommunity Hospital (Orange Co)
LRR Los Robles Hospital and Medical Center (Ventura Co.)
MCP Mission Community Hospital
MHG Memorial Hospital of Gardena
MID Olympia Medical Center
MLK Martin Luther King Jr. Community Hospital
MPH Monterey Park Hospital
NOR LA Community Hospital at Norwalk
NRH Northridge Hospital MedicalCenter
OTH Other Hospital Not on List
OVM LAC Olive View Medical Center
PAC Pacifica Hospital of the Valley
PIH PIH Health Hospital - Whittier
PLB College Medical Center
PLH Placentia Linda Hospital (Orange County)
PVC Pomona Valley Hospital Medical Center
QOA Hollywood Presbyterian Medical Center
QVH Citrus Valley Medical Center-Queen of the Valley Campus
RCC Ridgecrest Regional Hospital (Kern Co.)
SAC San Antonio Community Hospital (San Bernardino Co)
SDC San Dimas Community Hospital
SFM Saint Francis Medical Center
SGC San Gabriel Valley Medical Center
SIM Simi Valley Hospital (Ventura Co.)
SJD Saint Jude Medical Center (Orange Co)
SJH Providence Saint John's Health Center
SJO Saint John's Regional Medical Center (Ventura Co)
SJS Providence Saint Joseph Medical Center
SMH UCLA Medical Center, Santa Monica
SMM Saint Mary Medical Center
SOC Sherman Oaks Hospital
SPP Providence Little Company of Mary San Pedro
SVH Saint Vincent Medical Center
TOR Torrance Memorial Medical Center
TRM Providence Tarzana Medical Center
UCI UCI Medical Center (Orange Co)
UCL Ronald Reagan UCLA Medical Center
USC LAC+USC Medical Center
VHH USC Verdugo Hills Hospital
VPH Valley Presbyterian Hospital
WAM West Anaheim Medical Center Santa Ana (Orange County)
WHH Whittier Hospital Medical Center
WMH White Memorial Medical Center

CONTACT CODES

CNA Contact Not Attempted
MAC Medical Alert Center
PRO Protocol Run

AMBULANCE CODES

AA American Professional Ambulance Corp.
AB AmbuLive Ambulance, Inc.
AC Americare Ambulance Service
AM Adult Medical Transportation
AN Antelope Ambulance Service
AR American Medical Response
AT All Town Ambulance
AU AmbuServe Ambulance
AW AMWest Ambulance
AZ Ambulnz Health, Inc.
BA Burbank Airport Fire Department
CA Care Ambulance
CL CAL-MED Ambulance
EA Emergency Ambulance
EL Elite Ambulance
EX Explorer 1 Ambulance & Medical Service
FC First Care Ambulance
FM Firstmed Ambulance
GC Gentle Care Transport
GR Gentle Ride Ambulance
GU Guardian Ambulance Service
LE Lifeline Ambulance
LT Liberty Ambulance
LY Lynch EMS Ambulance
MA Mauran Ambulance
MI MedResponse, Inc.
ML Med-Life Ambulance
MR MedReach Ambulance
MS Medi-Star Transport
MT MedCoast Ambulance
OC Orange County Provider
OT Other
PE Premier Medical Transport
PN PRN Ambulance, Inc.
PT Priority One
RO Rescue One Ambulance
RR Rescue Services (Medic 1)
RY Royalty Ambulance
SB San Bernardino County Provider
SC Schaefer Ambulance
SO Southern California Ambulance
ST Star Medical Transportation, Inc.
SY Symons Ambulance (Special Events Only)
TL TransLife, Inc.
TR Trinity Ambulance
UC UCLA Emer Med Serv
WE West Coast Ambulance
WM Westmed/McCormick Ambulance
WVA Wadsworth VA (NON-BASIC)

HELICOPTER CODES

CF LA County Fire
CG US Coast Guard
CI LA City Fire Dept
CS LA Co Sheriff Dept
MY Mercy Air Ambulance
OH Other Helicopter
RE REACH Air Medical Services
UF Upland Fire
VC Ventura Co Sheriff Dept

CITY CODES

AA Arleta
AC Acton
AD Altadena
AE Arlington Heights
AG Agoura Hills
AG Agua Dulce
AL Alhambra
AN Athens
AO Avocado Heights
AR Arcadia
AT Artesia
AV Avalon
AW Atwater Village
AZ Azusa
BA Bel Air Estates
BC Bell Canyon
BE Bellflower
BG Bell Gardens
BH Beverly Hills
BK Bixby Knolls
BL Bell
BN Baldwin Hills
BO Bouquet Canyon
BP Baldwin Park
BR Bradbury
BS Belmont Shore
BT Bassett
BU Burbank
BV Beverly Glen
BW Brentwood
BX Box Canyon
BY Boyle Heights
BZ Byzantine-Latino Quarter
CA Carson
CB Calabasas
CC Culver City
CE Cerritos
CH Chatsworth
CI Chinatown
CL Claremont
CM Compton
CN Canyon Country
CO Commerce
CR Crenshaw
CS Castaic
CT Century City
CU Cudahy
CV Covina
CY Cypres Park
DB Diamond Bar
DO Downey
DS Del Sur
DU Duarte
DZ Dominguez
EM El Monte
EN Encino
EO El Sereno
EP Echo Park
ER Eagle Rock
ES El Segundo
EV Elysian Valley
EZ East Rancho Dominguez
FA Fairmont
FO Fair Oaks Ranch
GA Gardena
GF Griffith Park
GH Granada Hills
GK Glendale
GL Glendale
GP Glassell Park
GR Gorman
GV Glenview
GW Glendora
HA Hawthorne
HB Hermosa Beach
HC Hacienda Heights
HE Harvard Heights
HG Hawaiian Gardens
HH Hidden Hills
HI Highland Park
HK Holly Park
HO Hollywood
HP Huntington Park
HR Harbor City
HY Hyde Park
IG Inglewood
IN Industry
IR Irwindale
JH Juniper Hills
JP Jefferson Park
KO Koreatown
LA Los Angeles
LB Long Beach
LC La Canada/Flintridge
LF Los Feliz
LG Lake Hughes
LH La Habra Hghts
LK Lakewood
LL Lake Los Angeles
LM La Mirada
LN Lawndale
LO Lomita
LP La Puente
LQ LAX
LR La Crescenta
LS Los Nietos
LT Lancaster
LV La Verne
LW Lake View Terrace
LY Lynwood
MA Malibu
MB Manhattan Beach
MC Malibu Beach
MD Marina del Rey
ME Monte Nido
MG Montecito Heights
MH Mission Hills
MI Mint Canyon
MM Miracle Mile
MN Montrose
MO Montebello
MP Monterey Park
MR Mar Vista
MS Mount Wilson
MT Montclair
MU Mount Olympus
MV Monrovia
MW Maywood
MY Metler Valley
NA Naples
NE Newhall
NH North Hollywood
NN Neenach
NO Norwalk
NR Northridge
NT North Hills
OP Ocean Park
OT Other
PA Pasadena
PC Pacoima
PD Palmdale
PE Pacific Palisades
PH Pacific Highlands
PI Phillips Ranch
PL Playa Vista
PM Paramount
PN Panorama City
PO Pomona
PP Palos Verdes Peninsula
PR Pico Rivera
PS Palms
PT Porter Ranch
PV Palos Verdes Est
PY Playa del Rey
QH Quartz Hill
RB Redondo Beach
RC Roosevelt Corner
RD Rancho Dominguez
RE Rolling Hills Est
RH Rolling Hills
RK Rancho Park
RL Rowland Heights
RM Rosemead
RP Rancho P V
RS Reseda
RV Rampart Village
RW Rosewood
SA Saugus
SB Sandberg
SC Santa Clarita
SD San Dimas
SE South El Monte
SF San Fernando
SG San Gabriel
SH Signal Hill
SI Sierra Madre
SJ Silver Lake
SK Sherman Oaks
SL Sun Valley
SM Santa Monica
SN San Marino
SO South Gate
SP South Pasadena
SQ Sleepy Valley
SR San Pedro
SS Santa Fe Springs
ST Studio City
SU Sunland
SV Stevenson Ranch
SY Sylmar
TA Tarzana
TC Temple City
TD Tropico
TE Topanga State Park
TI Terminal Island
TL Toluca Lake
TO Torrance
TP Topanga
TT Toluca Terrace
TU Tujunga
UC Universal City
UP University Park
VA Valencia
VC Venice
VE Vernon
VG Valley Glen
VI Valley Village
VN Van Nuys
VY Valyermo
WA Walnut
WC West Covina
WE West Hills
WG Wilsona Gardens
WH West Hollywood
WI Whittier
WK Winnetka
WL Woodland Hills
WM Wilmington
WO Westlake
WR Westchester
WS Windsor Square
WV Westlake Village
WVA Wadsworth VA (NON BASIC)
WW Westwood

TRAINING COPY

MULTICASUALTY INCIDENT

Name: ____ Triage Tag # ____ Age ____ Sex ____ Wt ____	☐ Immediate ☐ Delayed ☐ Minor ☐ DOA	Injuries:	Resp: ____ Pulse: ____ Cap Refill: ☐ < 2 seconds ☐ > 2 seconds GCS: ____	Treatment:	Receiving Facility: ____ ETA/Unit ____ / ____
Name: ____ Triage Tag # ____ Age ____ Sex ____ Wt ____	☐ Immediate ☐ Delayed ☐ Minor ☐ DOA	Injuries:	Resp: ____ Pulse: ____ Cap Refill: ☐ < 2 seconds ☐ > 2 seconds GCS: ____	Treatment:	Receiving Facility: ____ ETA/Unit ____ / ____
Name: ____ Triage Tag # ____ Age ____ Sex ____ Wt ____	☐ Immediate ☐ Delayed ☐ Minor ☐ DOA	Injuries:	Resp: ____ Pulse: ____ Cap Refill: ☐ < 2 seconds ☐ > 2 seconds GCS: ____	Treatment:	Receiving Facility: ____ ETA/Unit ____ / ____
Name: ____ Triage Tag # ____ Age ____ Sex ____ Wt ____	☐ Immediate ☐ Delayed ☐ Minor ☐ DOA	Injuries:	Resp: ____ Pulse: ____ Cap Refill: ☐ < 2 seconds ☐ > 2 seconds GCS: ____	Treatment:	Receiving Facility: ____ ETA/Unit ____ / ____
Name: ____ Triage Tag # ____ Age ____ Sex ____ Wt ____	☐ Immediate ☐ Delayed ☐ Minor ☐ DOA	Injuries:	Resp: ____ Pulse: ____ Cap Refill: ☐ < 2 seconds ☐ > 2 seconds GCS: ____	Treatment:	Receiving Facility: ____ ETA/Unit ____ / ____
Name: ____ Triage Tag # ____ Age ____ Sex ____ Wt ____	☐ Immediate ☐ Delayed ☐ Minor ☐ DOA	Injuries:	Resp: ____ Pulse: ____ Cap Refill: ☐ < 2 seconds ☐ > 2 seconds GCS: ____	Treatment:	Receiving Facility: ____ ETA/Unit ____ / ____

TRAINING COPY

Patient Care Report Narrative

- ___ Y/O (M, F) or ( )
- Found ( )
- In (Bed, W/C, Dialysis Chair, etc.)
- / (NAD, AD)
- A&Ox (1,2,3)
- H.E.E.N.T. (Head, Eyes, Ears, Nose, Throat)
- O.P.Q.R.S.T. (Onset, Provoked, Quality, Region/R, Sev., Time)
- S.A.M.P.L.E. (Signs/S, Allergies, Meds, Past Hx, Last, Events)
- Pertinent Negatives (-/+ SOB, N/V/D, Pain, C/P)
- Pt. Admits/ Denies
- Document Diagram (Shunt, AV, Foley, BKA, AKA, Pace Maker)

- Pt. → to gurney via (Draw Sheet, G/S Lift, Gait Assist)
- Pt. placed in POC ( )
- Pt. strapped and secured to gurney
- Treatment (meds administered, N/V/D, No incident)
- Pt. V/S (Stable/ Unstable)
- Pt. Loaded into Ambulance
- Pt. transported / (- , +) (V/S stable/ unstable)
- Pt. Unloaded from Ambulance

- Pt. → to (Bed, W/C, etc.) Via (Draw S., G/S Lift, Gait Assist)
- Staff (RN, LVN, MD, PA) advised on Pt. condition
- No further incidents noted/ No other Complaints

SECTION 16:
APPROVED ABBREVIATIONS

ABBREVIATION	MEANING
ā	before
Ab	abortion
abd	abdomen
adm	admission
AED	automatic external defibrillator
AIDS	acquired immune deficiency syndrome
AKA	above the knee amputation
ALC	altered level of consciousness
ALS	advanced life support
am	morning
AMA	against medical advice
Amb	ambulation/ambulance
amt	amount
ant	anterior
a/o x4	alert, oriented times 4 parameters
approx	approximately
appt	appointment
ARDS	adult respiratory distress syndrome
ASA	aspirin
ASAP	as soon as possible
ASHD	atherosclerotic heart disease
BCP	birth control pills
BIB	brought in by
BKA	below the knee amputation
BLS	basic life support
BM	bowel movement
BOA	born out of asepsis
BOW	bag of waters
BP	blood pressure
BS	breath sounds
BSA	body surface area

ABBREVIATION	MEANING
$\bar{w}$	with
C	centigrade
CA	cancer
CAD	coronary artery disease
Cc	cubic centimeter
CC or c/c	chief complaint
CHF	congestive heart failure
cm	centimeter
C/O	complains of
CO_2	carbon dioxide
COA	condition on arrival
COPD	chronic obstructive pulmonary disease
CP	chest Pain
CPR	cardiopulmonary resuscitation
CRF	chronic renal failure
CSF	cerebrospinal fluid
CSM	circulation, sensation, movement
CVA	cerebral vascular accident
CXR	chest x-ray
D&C	dilation and curettage
dc	discharge/discontinue
DM	diabetes mellitus
DNR	do not resuscitate
DOA	dead on arrival
DOB	date of birth
DOE	dyspnea on exertion
drg	dressing
DT's	delirium tremors
DVT	deep vein thrombosis
DX	diagnosis
EBL	estimated blood loss
ED/ER	emergency dept. / emergency room
EDAP	emergency dept. approved for pediatrics
EKG	electrocardiogram
EMS	emergency medical services
EMT	emergency medical technician

ABBREVIATION	MEANING
EMT-AA	emergency medical technician-advanced airway
EMT-D	emergency medical technician-defibrillation
EMT-P	emergency medical technician-paramedic
ET	endotracheal
ETA	estimated time of arrival
ETC	endotracheal COMBITUBE®
ETOH	ethanol (alcohol)
eval	evaluation
FB	foreign body
f/up	follow up
fx	fracture
G	gravida
GB	gallbladder
GI	gastrointestinal
gm	gram
GSW	gunshot wound
gtt	drop
GU	genitourinary
HMO	health maintenance organization
hosp	hospital
hr(s)	hour(s)
hs	at night
ht	height
HTN	hypertension
Hx	history
ICU	intensive care unit
Inc Ab	incomplete abortion
IUD	intrauterine device
IUP	intrauterine pregnancy
IV	intravenous
IVP	Intravenous push
JVD	jugular vein distention
KCL	potassium chloride
kg	kilogram
KO	knocked out (loss of consciousness)
KVO	keep vein open
L	liter

ABBREVIATION	MEANING
(L)	left
lab	laboratory
lac	laceration
lb	pound
LLE	left lower extremity
LLL	left lower lobe (lung)
LLQ	left lower quadrant (abdomen)
LMP	last menstrual period
LNMP	last normal menstrual period
LOC	level of consciousness/loss of consciousness
LUE	left upper extremity
LUL	left upper lobe (lung)
LUQ	left upper quadrant
MAR	most accessible receiving facility
max	maximum
MCL	mid clavicular line
MD/PMD	medical doctor/private medical doctor
mEq	milliequivalent
mg	milligram
MI	myocardial infarction
MICN	mobile intensive care nurse
min	minutes/minimum
ml	milliliter
mo	month
MS	multiple sclerosis/morphine sulfate
MVA	motor vehicle accident
NA	not applicable/not available
NAD	no apparent distress
narc	narcotic
NB	newborn
neg	negative
NKA	no known allergies
NP	nurse practitioner
npo	nothing per mouth
NSR	normal sinus rhythm
NTG	nitroglycerin
nv	nausea/vomiting

ABBREVIATION	MEANING
n/v/d	nausea/vomiting/diarrhea
O_2	oxygen
O_2 sat	oxygen saturation
OB/GYN	obstetrical/gynecological
OBS	organic brain syndrome
OD	overdose/right eye
OS	left eye
OU	both eyes
/p	after
P	para
PMC	Pediatric Medical Care (Center)
PE	physical exam/pedal edema/pulmonary embolus
Peds	pediatric/pedestrian
perf	perforation
PERL	pupils equal, react to light
PIH	pregnancy induced hypertension
pm	evening
PMH	past medical history
PMS	pulse, motor, sensation
po	by mouth
post	posterior/after
PPD	purified protein derivative (TB skin test)
pr	per rectum
prn	as needed
PSI	passenger space intrusion
Psych	psychiatric
pt	patient
PTA	prior to arrival
pulm	pulmonary
PVC	premature ventricular contraction
q	every
®	right
rehab	rehabilitation
RLE	right lower extremity
RLL	right lower lob (lung)
RLQ	right middle quadrant (abdomen)

ABBREVIATION	MEANING
RML	right middle lobe (lung)
RN	registered nurse
r/o	rule out
RTS	revised trauma score
RUE	right upper extremity
RUL	right upper lobe (lung)
RUQ	right upper quadrant (abdomen)
Rx	prescription
/w	without
SC	specialty center
sec	second
SIDS	sudden infant death syndrome
SL	saline lock/sublingual
SOB	shortness of breath
sq	square
SQ	subcutaneous
SW	stab wound
TB	tuberculosis
TBC	total body check
Tbsp	tablespoon
TC	traffic collision
TIA	transient ischemic attack
TKO	to keep open (IV rate)
tsp	teaspoon
TV	tidal volume
unk	unknown
UTI	urinary tract infection
vag	vaginal
vol	volume
vs	versus
VS	vital signs
wk	weak
WNL	within normal limits
w/o	without
wt	weight
y/o	year old

ABBREVIATION	MEANING
yr	year
@	at
&	and
↑	increase/positive
↑	decrease/negative
%	percent
2^{o}	secondary to
Δ	change
=	equal
♀	female
♂	male
#	number
>	greater than
<	less than
+	plus/positive
-	minus/negative

DEPARTMENT OF HEALTH SERVICES
COUNTY OF LOS ANGLES

REFERENCE No. 506.1 Trauma Triage Decision Scheme

Physiological Assessment

1

- Systolic blood pressure (SBP): < 90 mmHg, or < 70 mm Hg in infant < 1 yr
- Respiratory rate: > 29 breaths/minute (sustained), < 10 breaths/minute, < 20 breaths/minute in infant < 1 yr, or requiring ventilatory support
- Cardiopulmonary arrest with penetrating torso trauma

→ YES → Immediate transport to designated Trauma Center

NO ↓

Anatomical Injury Assessment

2

- ALL penetrating injuries to head, neck, torso, and extremities above the elbow or knee
- Blunt head injury associated with: suspected skull fracture, GCS ≤ 14, seizures, unequal pupils, or focal neurological deficit
- Spinal injury associated with acute sensory or motor deficit
- Blunt chest injury with unstable chest wall (flail chest)
- Diffuse abdominal tenderness
- Suspected pelvic fracture (excluding isolated hip fracture from a ground level fall)
- Extremity with: neuro/vascular compromise and/or crushed, degloved or mangled; amputation proximal to the wrist or ankle; or fractures of ≥ 2 proximal (humerus/femur) long-bones bleeding requiring tourniquet or hemostatic agent
- Major/Critical Burns: ≥15 years with 2nd or 3rd degree burns ≥ 20% TBSA; ≤ 14 years with 2nd or 3rd degree burns ≥ 10% TBSA

→ YES → Immediate transport to designated Trauma Center

NO ↓

Mechanism of Injury Assessment

3

- Falls: Adult Patients > 15 feet; Pediatric Patients > 10 feet, or > 3 times the height of the child
- Passenger Space Intrusion: > 12 inches into an occupied passenger space
- Ejected from vehicle (partial or complete)
- Auto v. ped/bicyclist/motorcyclist thrown, run over, or impact > 20 mph
- Unenclosed transport crash with significant impact (> 20 mph)

→ YES → Immediate transport to designated Trauma Center

NO ↓

Trauma Guidelines Assessment

4

- Passenger Space Intrusion > 18 inches into an unoccupied passenger space
- Auto versus pedestrian/bicyclist/motorcyclist (impact ≤ 20 mph)
- Injured victims of vehicle crashes with a fatality in the same vehicle
- Patients requiring extrication
- Vehicle telemetry data consistent with high risk of injury
- Injured patients (excluding isolated minor extremity injuries): on anticoagulation therapy other than aspirin-only; or with bleeding disorders

→ YES → In consult with Trauma Center/ Base Hospital, transport to designated Trauma Center is advisable

NO ↓

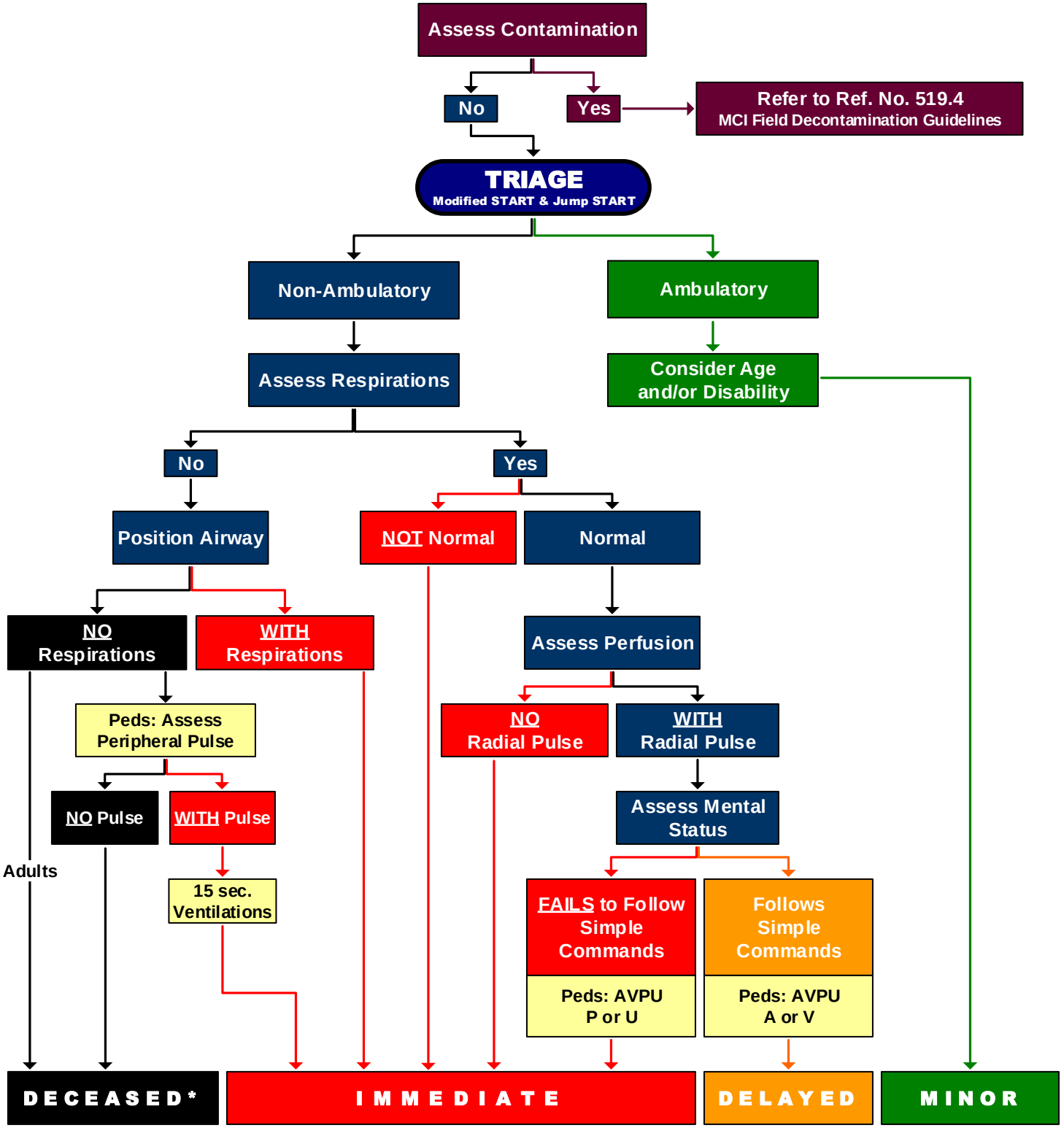
Special Considerations Assessment

5

- Blunt traumatic full arrest
- Adults age > 55 years
- SBP < 110 mmHg may represent shock after age 65 years
- Pregnancy > 20 weeks
- Prehospital judgment

→ YES → Consider transport to designated Trauma Center

If in doubt, transport to the Trauma Center


Assess Contamination
No
Yes
Refer to Ref. No. 519.4
MCI Field Decontamination Guidelines
TRIAGE
Modified START & Jump START
Non-Ambulatory
Ambulatory
Assess Respirations
Consider Age and/or Disability
No
Yes
Position Airway
NOT Normal
Normal
NO Respirations
WITH Respirations
Assess Perfusion
Peds: Assess Peripheral Pulse
NO Radial Pulse
WITH Radial Pulse
NO Pulse
WITH Pulse
Assess Mental Status
Adults
15 sec. Ventilations
FAILS to Follow Simple Commands
Follows Simple Commands
Peds: AVPU P or U
Peds: AVPU A or V
DECEASED*
IMMEDIATE
DELAYED
MINOR

California Tactical Casualty Care Training Guidelines:

- Tactical First Aid/ Tactical Emergency Medical Support (TEMS) First Responder Operations (FRO)
- Tactical Lifesaver/ Tactical Emergency Medical Support (TEMS) Technician

Emergency Medical Services Authority
California Health and Human Services Agency

EMSA #370
June 2017

1
INTRODUCTION

Purpose

California statutes require the Emergency Medical Services (EMS) Authority to establish additional training standards for first responders to provide emergency medical services during active law enforcement incidents such as active shooter and terrorism events[1]. In 2014, working closely with EMS, fire, and law enforcement educators and providers, tactical casualty care training program standards were developed. In 2015, regulations were updated to include basic tactical casualty care training during initial public safety first aid and CPR training[2]. These guidelines, approved in 2017 by the EMS Authority and Commission on EMS, are intended to be used as a reference for EMS training program and continuing education EMS providers to develop comprehensive, stand-alone, tactical casualty care training programs and for the approval of course curriculum by training program approval authorities.

As the framework for tactical casualty care training program development, this document is also designed to provide competency standards for statewide public safety, fire, and EMS agency personnel. These guidelines are intended to harmonize with, and be complementary to, those developed in collaboration with the California Commission on Peace Officer Standards and Training (POST) for the Tactical Medic and/or Tactical Medicine Specialist[3] and those identified by members of the organization, Firefighting Resources of California Organized for Potential Emergencies (FIRESCOPE).

Additionally, the EMS Authority is responsible for setting the statewide medical training standards utilized by POST; therefore, these guidelines are intended to serve as a template for the development of operational programs by any public safety agency in California, and to serve as the minimum competency training standards for initial emergency medical services training.

Legislative Intent

In enacting AB 1598, the legislature made several important additions or changes to statutory language found in California Health and Safety Code 1797.116, 1797.134, California Government Code 8588.10, California Penal Code 13514.1 and 13519.12 to

[1] California Health and Safety Code 1797.116, 1797.134, California Government Code 8588.10, California Penal Code 13514.1 and 13519.12
[2] California Code of Regulations, Title 22, Division 9, Chapter 1.5
[3] Commission on Peace Officer Standards and Training. *Tactical Medicine: Operational Programs and Standardized Training Recommendations*. West Sacramento, CA. (2009).

better prepare public safety personnel to provide tactical casualty care and coordinate with emergency medical services during terrorism incidents[4].

For the purposes of AB1598, and this document, a “terrorism incident” includes, but is not limited to, an active shooter incident. An “active shooter incident” is an incident where an individual is actively engaged in killing or attempting to kill people.

The California legislature noted in their intent language that “since the Columbine High School shootings that occurred in 1999, more than 250 people have been killed in the United States during what has been classified as active shooter and mass casualty incidents.” They observed that “these incidents involve one or more suspects who participate in an ongoing, random, or systematic shooting spree, demonstrating the intent to harm others with the objective of mass murder.” Moreover, the legislature said, “It also became evident that these events may take place in any community or venue and that they impact fire and police departments, regardless of their size or capacity. Local jurisdictions vary widely in available emergency response resources, staffing, and equipment allocations.”

In enacting AB1598, the legislature was prescribing that protocols and training for response to active shooter incidents must be established locally to work within the resource capabilities and limitations of each jurisdiction. The legislature intended AB1598 to do the following:

- Require the development of collaborative protocols and relationships between local and state first response entities, including law enforcement agencies, fire departments, and emergency medical services providers and agencies, in order that those entities shall act effectively and in concert to address active shooter incidents across California.
- Require first response entities to seek collaborative training opportunities, including, but not limited to, table top or simulation exercises, to assess plan implementations, and to include other entities that may be involved in active shooter incidents in those trainings, such as schools, city or county personnel, and private businesses.
- Require basic and ongoing training for law enforcement agency personnel, fire department personnel, emergency medical services personnel, and the personnel for other first responders include, as appropriate, training and education on active shooter incidents and tactical casualty care.

It was the intent of the Legislature that each first response entity, in collaboration with other law enforcement agencies, fire departments, and emergency medical services providers and agencies, develop protocols for responding to active shooter incidents.

[4] California Assemblymember Rodriguez (2014). AB 1598, *Active Shooter: Local Emergency Response Teams;* approved 09/27/2014.

Those protocols must be reviewed annually to ensure that they are current, and address any policy, geographic, or demographic changes that warrant a response strategy review. The Legislature intended that the protocols address all of the following:

- The roles, responsibilities, and policies of each entity in responding to an active shooter incident.
- Pre-assessment and contingency planning that includes identification of potential targets within the jurisdiction.
- Implementation of an Incident Command System (ICS), including emergency protocols for a unified command structure for entities responding to an active shooter incident.
- Interagency communication issues and needs, including, but not limited to, radio interoperability and establishment of common language, terms, and definitions to be used on the scene of an active shooter incident.
- Identification of resources for responding to an active shooter incident, including, but not limited to, primary and secondary needs and hospitals.
- Tactical deployment of available resources for responding to an active shooter incident.
- Emergency treatment and extraction of persons injured in an active shooter incident.

California Tactical Casualty Care and Tactical Medicine

In the State of California, medically trained, certified and/or licensed first responders may respond to an active law enforcement incident as either part of an established EMS system or from within an established law enforcement special operations team. As a result, first responder resources and response protocols to active law enforcement incidents vary greatly and are established through the coordination and collaboration of local EMS, fire, and law enforcement agencies. The EMS Authority, working closely with fire and law enforcement agencies, recognized these differences and identified two distinct categories of specialized tactical field medical response and training needs of first responders during active law enforcement incidents: 1) tactical casualty care and 2) tactical medicine.

Tactical casualty care is the delivery of specialized tactical emergency medical services (TEMS) to casualties of active shooter and terrorism events by first responders from an established EMS system to include, but not be limited to, public safety personnel, EMT's, Advanced EMT's, and paramedics as described by CCR Title 22, Division 9, Chapters 1.5 and Chapters 2-4. EMS providers who have been trained in tactical casualty care respond as medical support to law enforcement incidents and provide field tactical medical care to casualties usually in an area where there is minimal to no direct or immediate safety threat. Medical direction and oversight of the tactical casualty care first responder is provided by the local EMS medical director in coordination with local law enforcement.

In order to provide a range of specialized tactical medical field training to meet a diverse level of statewide public safety personnel, EMT, AEMT, and paramedic service provider needs, tactical casualty training standards were developed to incorporate not only EMS specific medical training, but also include fire and law enforcement response level training recommendations.

As a result, two distinct levels of tactical casualty care training program courses were identified:

1) Tactical First Aid/ TEMS FRO, 4 hours minimum
2) Tactical Lifesaver/ TEMS Technician, 40 hours minimum

The Tactical First Aid/ TEMS FRO course provides instruction on specialized tactical medical care techniques and a brief overview of tactical response and operations methodologies. The Tactical Lifesaver/ TEMS Technician course provides more advanced life support tactical medicine techniques and comprehensive instruction on the role of EMS in tactical response planning, response, and inter-department operations when providing medical support to law enforcement personnel during active shooter and terrorism incidents. Tactical EMS training courses approved by the EMS Authority prior to the effective date of this document may have different naming conventions. For those courses, training program providers shall modify their course names to reflect the course identification within this document of First Aid/FRO or Tactical Lifesaver/TEMS Technician for continued approval.

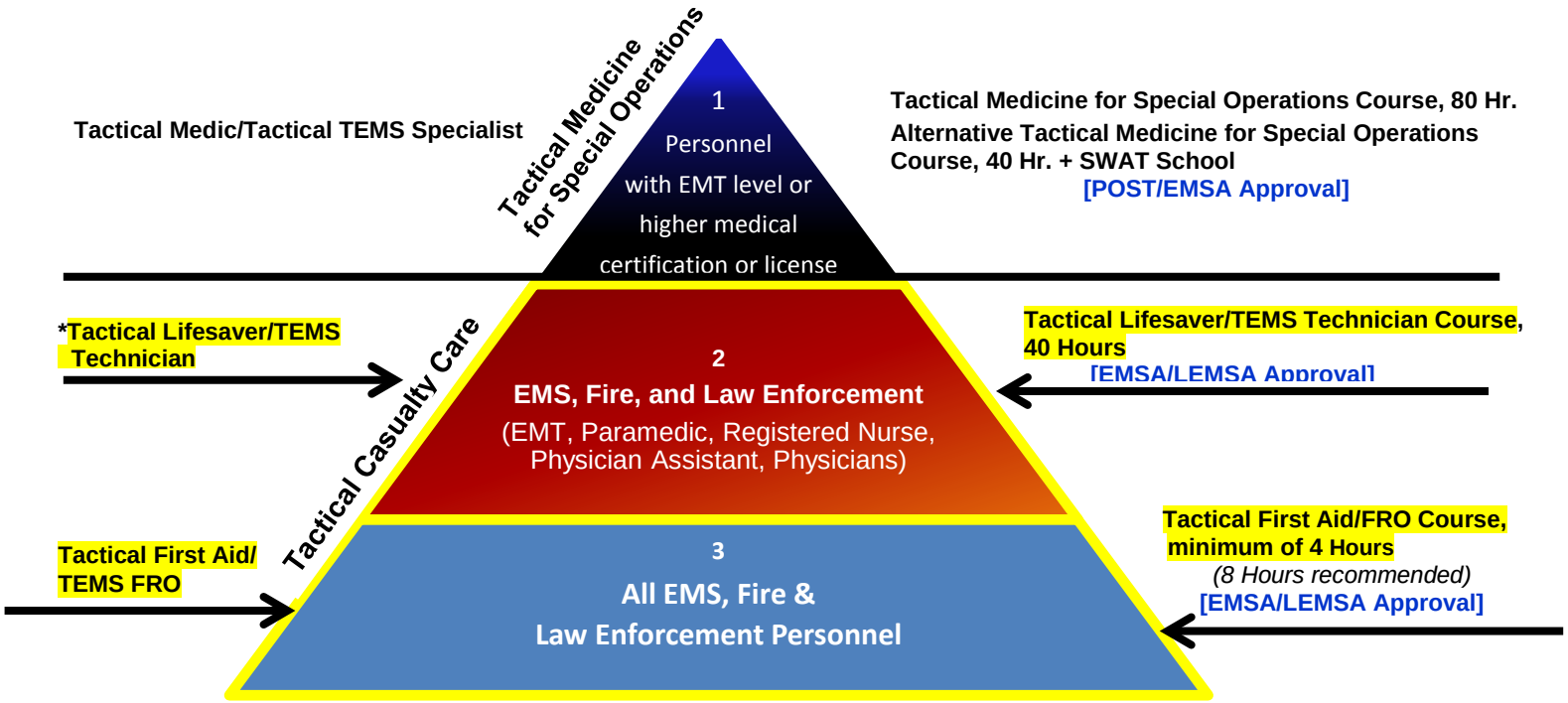
The EMS Authority and local EMS agencies are responsible for monitoring and approving tactical casualty care training programs. Training program or courses administered by statewide public safety agencies, such as the California Commission on Peace Officer Standards and Training, California Department of Parks and Recreation, California Department of Forestry and Fire Protection, and the Department of California Highway Patrol, out of state agencies, or other multi-jurisdictional public safety agencies are approved by the EMS Authority. Training programs or courses administered by local entities are approved by the local EMS agency that has jurisdiction within the area in which the program or course is headquartered.

Separately, Tactical Medicine for Special Operations is the delivery of specialized tactical emergency medical services to casualties of any active law enforcement incident by law enforcement personnel assigned to a Special Weapons and Tactics (SWAT) operations team, as described by California Penal Code 13514.1. Tactical Medicine for Special Operations first responders respond as an integral part of a SWAT operation team and may provide field tactical medical care to casualties in an area where there is a direct and immediate safety threat. Medical direction and oversight of the Tactical Medicine for Special Operations first responders are provided by a licensed physician in coordination with the local EMS agency as part of an established EMS system.

POST is responsible for monitoring and approving Tactical Medicine for Special Operations training programs and courses, in collaboration with review and approval by the EMS Authority. Additional information on the POST Tactical Medicine for Special Operations training and operation program can be found on the POST website at https://www.post.ca.gov.

The following diagram describes the spectrum of California tactical field medical response and training courses:

California Tactical Casualty Care and Tactical Medicine for Special Operations Training Programs



*Although the Tactical Lifesaver/TEMS Technician course includes comparable curriculum as the Tactical Medicine for Special Operations alternative 40 hour course, it is not considered an equivalent course for attendance in lieu of the Tactical Medicine for Special Operations courses required to operate as a Tactical Medic or Tactical TEMS Specialist integrated into a SWAT operations team.

Tactical Casualty Care Policies by Local EMS Agencies

Local EMS agencies (LEMSA's) and first responder providers should establish policies on the protocols and coordinated response of first responders to active law enforcement incidents. Policies developed should include ongoing local training needs assessments and the collaboration of joint training and exercises with law enforcement, fire service, and EMS personnel using Incident Command System (ICS) principles and terminology.

2
APPLICATION OF TRAINING STANDARDS

The application of these training standards is designed to provide EMTs, AEMTs, paramedics, and other first responders standardized tactical casualty care training. Although these courses do not require prerequisites to attend, it is recommended that students have prior first aid, CPR, and AED knowledge or experience consistent with public safety first aid training pursuant to CCR, Title 22, Division 9, Chapter 1.5. It is highly recommended that all EMTs, Advanced EMTs, and paramedics are trained to the standards described in these guidelines.

Due to a broad range of potential attendees, tactical casualty care program providers and instructors should assess attendees' current medical knowledge and skills then adjust their course curriculum to meet student needs. Instructors should also emphasize the important role of local EMS and law enforcement jurisdiction protocols, policies, and resources, as well as individual student scope of practices within those jurisdictions, when considering the application of tactical casualty care training.

The Tactical First Aid/TEMS FRO is a course designed to provide first responders basic tactical casualty care techniques and a broad overview of law enforcement tactical operations and first responder rescue operations methodologies. Course content shall include instructor demonstrations and student skills testing to achieve the competency standards identified in Section 3 of this document.

The Tactical Lifesaver/TEMS Technician course is intended for public safety personnel, EMT's, AEMT's, paramedics, and other individuals (such as physicians or nurses) with minimal to no knowledge or experience in Tactical Casualty Care techniques that may either volunteer or be employed to perform medical support in an area deemed safe, or of minimal safety risk, during an active shooter or terrorism incident. Course content shall include instructor demonstrations and student skills testing to achieve the competency standards identified in Section 4 of this document.

Tactical First Aid/TEMS FRO Course Overview

The Tactical First Aid/TEMS FRO is a course designed to provide first responders basic tactical casualty care techniques and a broad overview of law enforcement tactical operations and first responder rescue operations methodologies. Course content shall include instructor demonstrations and student skills testing to achieve the competency standards identified in Section 3 of this document. Although this course does not require prerequisites to attend, it is recommended that students have prior first aid, CPR, and AED knowledge or experience consistent with public safety first aid training pursuant to CCR, Title 22, Division 9, Chapter 1.5.

Upon completion of this course, first responders will possess the basic knowledge and skills to administer tactical casualty care to casualties during an active law enforcement incident. The course may be provided as initial training or as a continuing education course. A minimum of four (4) hours training is required, although eight (8) hours of training is recommended. The course must include the following topics:

- An overview of the California tactical casualty care initiative and its emergency medical and fire agency personnel response to active law enforcement incidents within state EMS systems,
- common tactical and rescue terminology and operations,
- description and demonstration of basic tactical casualty care techniques,
- casualty movement and evacuation techniques,
- medical planning and threat assessment considerations, and
- comprehensive, competency-based student demonstration and, when applicable, student skills testing.

Students that have successfully attended a minimum of four (4) hours of training and demonstrated a level of competency in the topics and skills described in the Curriculum content of this course through written tests and, when applicable, skills testing, shall be issued a Tactical First Aid/TEMS FRO certificate of completion.

Tactical Lifesaver/TEMS Technician Course Overview

Completion of this course should provide first responders thorough knowledge and detailed tactical casualty care skills to administer adjunct basic and advanced medical life support to casualties of an active shooter or terrorism incident. This course may be provided as initial training or as a continuing education course. A minimum of forty (40) hours training is required; and shall include the following topics:

- Introduction and course administration and safety
- An overview of the California tactical casualty care initiative
- The role of California EMS personnel as it relates to medical planning, EMS medical support response, and inter-department operations
- common tactical and rescue terminology and operations,
- casualty movement and evacuation techniques,
- threat assessment considerations,
- Hemostasis: hemorrhage control management skills
- airway and respiration management skills
- circulation management skills
- environmental injuries management
- medication administration and pain management
- medical aspects of tactical operations
- team health management, and
- comprehensive, competency-based student demonstration and skills testing.

Students that have attended a minimum of forty (40) hours of training and have successfully demonstrated, through skills assessments and testing, a level of competency in the course curriculum topics in Chapter 3 of this document shall be issued a Tactical Lifesaver/TEMS Technician certificate of completion.

3

Curriculum Content:
Tactical First Aid/TEMS FRO

Minimum 4 Hour Course

Learning Domain 1: History and Background

Competency 1.1: Demonstrate knowledge of tactical casualty care historical developments

1.1.1 Demonstrate knowledge of tactical casualty care historical developments
- History of active shooter and domestic terrorism incidents
- Define roles and responsibilities of first responders including:
  - Law Enforcement
  - Fire
  - EMS
- Review of local active shooter policies
- Scope of Practice and authorized skills and procedures by level of training, certification, and licensure zone[5] ***[Appendix F]***

Learning Domain 2: Terminology and definitions

Competency 2.1: Demonstrate knowledge of terminology

2.1.1 Demonstrate knowledge of terminology
- Hot Zone[6], Warm Zone, and Cold Zone
- Casualty Collection Point (CCP)
- Rescue Task Force (RTF)
- Cover and Concealment

Learning Domain 3: Coordination, Command and Control

Competency 3.1: Demonstrate knowledge of incident command and agency integration into tactical operations

3.1.1 Demonstrate knowledge of team coordination, command, and control

[5] NOTE: Always stay within scope of practice for level of certification/licensure and follow the protocols approved by the local EMS agency
[6] The role of the TEMS technician is primarily focused on operations in the Warm Zone

- Incident Command System (ICS) and National Incident Management System (NIMS)
- Mutual Aid considerations
- Unified Command
- Communications, including radio interoperability
- Command post
  - Staging areas
  - Ingress/egress
  - Managing priorities—some priorities must be managed simultaneously

Learning Domain 4: Tactical and Rescue Operations

Competency 4.1: Demonstrate knowledge of tactical and rescue operations

4.1.1 Tactical Operations—law enforcement
- The priority is to mitigate the threat
- Contact Team
- Rescue Team

4.1.2 Rescue Operations—law enforcement/EMS/fire
- The priority is to provide life-saving interventions to injured parties
- Formation of Rescue Task Force (RTF)
- Casualty Collection Points (CCP)

Learning Domain 5: Basic Tactical Casualty Care and Evacuation

Competency 5.1: Demonstrate appropriate casualty care at your scope of practice and certification/licensure

5.1.1 Demonstrate knowledge of the components of the Individual First Aid Kit (IFAK) and/or medical kit ***[Appendix E]***

5.1.2 Understand the priorities of Tactical Casualty Care as applied by zone ***[Appendix B]***

5.1.3 Demonstrate competency through practical testing of the following medical treatment skills:
- Bleeding control
  - Apply tourniquet
    - Self-Application
    - Application on others
  - Apply direct pressure

    - Apply hemostatic dressing, to include wound packing, utilizing California EMSA-approved products
    - Apply pressure dressing
  - Basic airway management
    - Perform Head-Tilt/Chin-Lift Maneuver
    - Recovery position
    - Position of comfort
    - Airway adjuncts, such as nasopharyngeal airway (NPA) and oropharyngeal airway (OFA) insertion, if approved by the Local EMS agency
  - Chest/torso wounds
  - Apply chest seals, vented preferred

5.1.4 Demonstrate competency in casualty movement and evacuation
  - Drags and lifts
  - Carries

5.1.5 Demonstrate knowledge of local multi-casualty/mass casualty incident protocols
  - Triage procedures; such as START or SALT[7]
  - CCP
  - Casualty triage and treatment
  - Casualty transport

Learning Domain 6: Threat Assessment

Competency 6.1: Demonstrate knowledge in threat assessment *[Appendix C]*

6.1.1 Understand and demonstrate knowledge of situational awareness
  - Pre-assessment of community risks and threats
  - Pre-incident planning and coordination
  - Medical resources available

Learning Domain 7: Student Practical Assessment

Competency 7.1: Demonstrate knowledge and skills through documented cognitive and/or skills evaluation

7.1.1 Student demonstration and assessment of the medical skills specified in Learning Domain 5, *Basic Tactical Casualty Care and Evacuation.*

[7] START- Simple Triage and Rapid Treatment
SALT- Sort, Assess, Lifesaving Interventions, Treatment/Transport

APPENDIX B

Basic Tactical Casualty Care (TCC) California Quick Reference Guide

Basic Tactical Casualty Care (TCC) California Quick Reference Guide

HOT ZONE / DIRECT THREAT (DTC) / CARE UNDER FIRE (CUF)
1. MITIGATE any threat and move to a safer position.
2. DIRECT CASUALTY to stay engaged in operation, if appropriate.
3. DIRECT CASUALTY to move to a safer positon and apply self-aid, if appropriate.
4. CASUALTY EXTRACTION. Move casualty from unsafe area to include using manual drags or carries, or use a soft litter or local devices, as needed.
5. STOP LIFE-THREATENING EXTERNAL HEMORRHAGE, using appropriate personal protective equipment **(PPE)**, if tactically feasible: **-Apply effective tourniquet** for hemorrhage that is anatomically amenable to application.
6. Consider quickly placing casualty in **recovery position** to protect airway.

WARM ZONE / INDIRECT THREAT CARE (ITC) / TACTICAL FIELD CARE (TFC)
1. Law enforcement casualties should have weapons made safe once the threat is neutralized or if mental status altered.
2. AIRWAY MANAGEMENT: a. Unconscious patient without airway obstruction: -**Chin lift / Jaw Thrust maneuver** -**Nasopharyngeal airway**, if approved by LEMSA as an optional scope skill -Place casualty in **recovery position** b. Patient with airway obstruction or impending airway obstruction: -**Chin lift / Jaw Thrust maneuver** -**Nasopharyngeal airway**, if approved LEMSA optional scope skill -Allow patient to assume position that best protects the airway, including **sitting up.** -Place casualty in **recovery position**
3. BREATHING: a. All open and/or sucking chest wounds should be treated by applying a **vented chest seal or non-vented occlusive seal** to cover the defect and secure it in place. b. Monitor for development of a tension pneumothorax.
4. BLEEDING: a. Assess for unrecognized hemorrhage and control all sources of bleeding. If not already done, use a **tourniquet**, and appropriate **pressure dressing**. b. For compressible hemorrhage not amenable to tourniquet use, apply a **CA EMS Authority approved hemostatic dressing** with a **pressure bandage.** c. Reassess all previous tourniquets. Consider exposing the injury to determine whether a tourniquet is still necessary. If not necessary, use other techniques to control bleeding and remove the tourniquet. d. Apply **emergency bandage** or direct pressure to the wound, if appropriate. e. For hemorrhage that cannot be controlled with a tourniquet, apply CA EMSA-approved **hemostatic dressing.**
5. ASSESS FOR HEMORRHAGIC SHOCK: a. Elevate Lower Extremities if casualty in shock.
6. PREVENTION OF HYPOTHERMIA: a. Minimize casualty exposure to the elements. Keep protective gear on if feasible. b. **Replace wet clothing** with dry, if possible. Place onto an insulated surface ASAP. c. Cover casualty with **self-heating** or **rescue blanket** to torso. d. Place **hypothermia prevention cap** on head. e. Use dry blankets, poncho liners, etc. to assist in heat retention and protection from exposure to wet elements.
7. PENETRATING EYE TRAUMA: a. Perform a rapid field test of visual acuity b. **Cover eye with a rigid eye shield** (NOT pressure patch).
8. REASSESS CASUALTY AND TREAT OTHER CONDITIONS AS NECESSARY: a. Complete **secondary survey** checking for additional injuries or conditions. b. Consider **splinting known/suspected fractures** or **spinal immobilization**, if indicated. c. Use **nerve agent auto-injector** (i.e. Duo-Dote) for Nerve Agent Intoxication, if approved by LEMSA as an optional scope skill. d. Use **Epi-Pen** for anaphylactic reaction, if approved by LEMSA as an optional scope skill.
9. BURNS: a. Aggressively monitor airway and respiratory casualty status with smoke inhalation or facial burns, including oxygen or cyanide antidote treatment when significant symptoms are present. b. Estimate TBSA and **cover burn area with dry, sterile dressings.**
10. MONITORING: a. Apply monitoring devices or diagnostic equipment, if available. b. Obtain vital signs.
11. PREPARE CASUALTY FOR MOVEMENT: a. Move casualty to site where evacuation is anticipated. b. Monitor airway, breathing, bleeding, and reevaluate casualty for shock.
12. COMMUNICATE WITH CASUALTY, IF POSSIBLE: a. Encourage, reassure, and explain care.
13. CPR AND AED: a. Resuscitation in the tactical environment for casualties of blast or penetrating trauma that have no pulse or respirations should only be treated when resources and conditions allow.
14. DOCUMENTATION: a. Document clinical assessments, treatments rendered, and changes in casualty status. b. Forward documentation to the next level of care provider.

BLUE*- Authorized Skills for Public Safety First Aid Providers and EMTs*
RED*- Local Optional Skills which may be added by the Local EMS Agency Medical Director*

California EMS Authority (2017)

APPENDIX C

Tactical Medical Planning and Threat Assessment Quick Reference Guide

Tactical Medical Planning and Threat Assessment Quick Reference Guide

MEDICAL INTELLIGENCE (MISSION AND PATIENTS)
1. Mission type:
2. Number of potential patient(s):
3. Ages of potential patient(s):
4. Pre-Existing conditions:
5. Special populations (pediatric, elderly, disabled, language barrier, etc.):
6. Other:

MEDICAL THREAT ASSESSMENT (TEAM)
1. Environment (weather, temperature, precipitation, wind)? Cold/Hot? Rain/Snow? Wind? Wind Direction? Health Considerations?
2. Hazardous Materials? Explosive Threats? Chemicals? Nuclear/Radiological? Improvised Explosive Devices?
3. Biological threats?
4. Animal threats?
5. Plant threats?
6. Regional specific threats?
7. Personal Protective Equipment needs (ballistic vest, helmet, mask)

California EMS Authority (2017)

MEDICAL PLANNING AND RESOURCES
1. Communication: Tactical Frequency:_____ Base Hospital:_____
2. Location of Key Areas: Staging Area:_____ Casualty Collection Point(s):_____ Triage Area/Treatment Area:_____
3. Hospital: Closest Hospital:_____ Trauma/Burn center:_____
4. EMS Transport: Ground Ambulance:_____ - Staging Area:_____ Air Ambulance:_____ - Landing Zone, Lat./Long.:_____
5. Support Services: Poison Control, 1-800-222-1222 Veterinary Services? Animal Control? Mental Health/Chaplain? Social Services/CPS/APS? Public Works?

TEAM HEALTH CONSIDERATIONS
1. Team medical records completed? Access to records?
2. Exposure protection:
3. Hydration:
4. Food/Nutrition:
5. Extended Operation Care (sleep, fatigue):
6. Rehabilitation/First Aid Station needs:
7. Other:

LA County Policies Related To Death & Dying - Ref #814 & 815

People who choose EMS as a career sometimes are very uncomfortable to participate in a run where death is the inevitable conclusion because they see death as a failure. Death is an inescapable part of the life experience and understanding how to best manage a dead or dying patient is an important EMS skill. LA County policies 814 and 815 can give guidance in managing situations where a patient is factually dead or has left written instructions concerning the type of treatment they wish to receive or not receive.

Diagnosing death is not always easy. How do you really know somebody is in fact undeniably dead? How do you know they are irreversibly dead such that any investment of time or resources would be a complete waste? Sometimes the exterior mutilation of a body is so extensive that death is completely obvious. Ref# 814 has identified these situations and if you find a patient like this you can be confident in calling them dead and not rendering any treatment.*

1. Decapitation
2. Massive crush injury
3. Penetration or blunt injury with evisceration of the heart lung or brain
4. Decomposition
5. Incineration
6. Accident victims who are pulseless/apneic and cannot receive care until they are extricated and it is going to take longer than 15 minutes to disentangle them
7. Victims of a blunt trauma mechanism who are pulseless/apneic and have no organized EKG activity on EMS arrival
8. Pulseless/apneic victims in an MCI situation
9. Drowning victims who have been submerged for one hour or more
10. Patients displaying rigor mortis
11. Patients displaying post mortem lividity

In these situations death is so certain that you do not even need to contact base hospital for direction you only need to document your assessment findings describing what you found. However, one important set of assessment findings that you MUST document involves the last two situations. (rigor & lividity)

Rigor mortis is the stiffness that appears in the body after death. It develops because as the muscle cells die they perform anaerobic metabolism and change their molecular composition. At the moment of death a body is limp. The stiffness in a dead body slowly comes on and slowly disappears again returning to limpness. Patients who have been bedridden (such as convalescent hospital patients) and not moved their muscles & joints regularly also develop stiffness in their body, this is called contractures. It is not uncommon to confuse contractures in a living body with rigor mortis in a dead body.

Lividity happens when upon death the pre and post-capillary sphincters dilate and allow an unlimited blood flow into the capillary bed. Blood flows through the arteries/veins by gravity and engorges the capillaries in the low hanging or dependant parts of the body. The congestion of blood can easily be seen below the skin. Post mortem lividity looks much like bruising on a living body.

Because rigor & lividity are hard to distinguish from contractures and bruising, if a paramedic is going to call somebody dead on these findings their assessment must include (and document on the PCR) a specific assessment of their respiratory, pulse and neuro status. Paramedics must open the airway and look/listen/feel for breathing for 30 seconds AND AUSCULTATE an apical pulse and palpate a carotid pulse for 60 seconds AND then check for absence of pupil reflexes and painful stimuli.

Whenever paramedics respond to a victim of (non-traumatic) cardiopulmonary arrest they should always begin BLS measures, then quickly before starting ALS procedures, they should look for indications to stop all treatments and call the patient 'dead'. One situation is where the patient is found to be in asystole without CPR and it is estimated that it has already been without CPR for 10 or more minutes. In this situation the patient can be called dead and left at scene without making any base hospital contact.

The second situation is when the patient is in (non-traumatic) cardiopulmonary arrest and paramedics are presented with papers that state that the patient refuses resuscitation. These papers have different names that include; DNR, Advance Health Care Directive (AHCD), Physicians Order for Life Sustaining Treatment (POLST) Durable Power of Attorney for Heath Care and Living Will. (There are technical differences between each that are not discussed here and some title are considered technically obsolete) While each form is a little different they are all meant to convey to responders the treatment that the indicated person wishes to receive at the time of their death. Most likely a friend or family member will give you this documentation.

First thing upon receiving them is to verify that the papers actually describe the person who is in full arrest. Next you should establish the relationship between the living person and the dying person. (Is the living person named on the papers?) Finally you should look to see what type of treatment the person has requested. It is unlikely that the papers are requesting a full ACLS work up. Most likely they are requesting no treatment after cardiac arrest. In situations where the papers and the family/bystanders are all in agreement that the dying person wanted no treatment at the time of death, then paramedics can cease all BLS treatment and call the patient dead without making base hospital contact and fully documenting the situation of course.

In situations where the papers are unclear (or unavailable) or the family/bystanders are in disagreement about the treatment the dying person had requested or the paramedic feels uncomfortable and would like additional direction they are always free to and should contact their base hospital. The base hospital may advise transport with BLS measures and then sort out the situation at the hospital.

Up to this point we have used the phrase "calling somebody dead". More technical language is pronouncing death and determining death. Interestingly, the term "pronouncing" death does not appear in California law. After a death an MD must file a death certificate listing the cause and the time of the death. The time listed on the death certificate is reflective of the time death was pronounced. The doctor's signature is an endorsement that they have been treating the deceased for a chronic medical condition and therefore know the cause of death and the time of death to the best of their knowledge. It is not a certification that the doctor pronounced death or that they were even in attendance at the time of death. In the state of California to pronounce death is really nothing more than stating or agreeing on a time that the death has occurred.

Determining a death is more involved. To make a determination of death is an indication that a person with medical training has performed a medical assessment (including physical exam and vital signs) that has lead to

a medical diagnosis of death. Determining death is more involved than just pronouncing death. The Paramedic assessment described earlier in this paper is the process necessary to determine death.

Transporting a patient to a hospital for treatment is expensive. There are costs for the ambulance and the ED staff and any medications or supplies. If a patient has no chance for survival it makes no sense to transport them to a hospital for care that is futile. CPR and other treatments are known to be less effective in a moving ambulance. In situations where a patient is in (non-traumatic) cardiopulmonary arrest and there is no indication to determine death as described above then paramedics should NOT transport until there has been a Return of Spontaneous Circulation (ROSC). Stay and work up the patient in the field. But for how long?

There are many reasons why a cardiac arrest might happen and each patient has their own unique medical history so LA County does not have any exact criteria specifying when a patient without ROSC should be pronounced, but Ref #814 does state that after 20 minutes of resuscitation without ROSC, then pronouncement should be considered. In these cases base contact will have been made and the Paramedics and hospital are all aware of the entire situation and the effectiveness of all treatments. When the base physician has determined that any further efforts are futile the base physician may pronounce the patient dead. (Note: the physician's pronouncement is based on the physical findings and determinations made by the paramedics on scene that have been relayed to the base)

So, the patient is dead, now what? Whether they ultimately are or not, all field deaths are initially to be considered Coroner's cases. This means that after pronouncement the body should not be moved without Coroner's authorization and all equipment should be left in place (ETT, IV). EMS personnel should remain on scene until law enforcement arrives to protect the scene for the Coroner. There are situations when bodies are removed from the scene and sometimes transported to the hospital. Situations where violence is an issue or the body is in public view or blocking traffic then an immediate removal might be best. You should have the Coroner's permission before any removal is made. Make base station contact to document your situation.

Because death is an uncomfortable emotional experience, after pronouncement the EMS personnel should then turn their attention to providing emotional support to the surviving family members. The shock of the situation might provoke medical symptoms in the survivors that require evaluation, but at a minimum paramedics should comfort them and answer any questions they have about the situation and any treatment that was rendered.

While there is more to making a death notification than can be explained here, remember that is always best to be direct and not use euphemisms. Describe the person as being "dead". They are not "asleep" or "passed on" or "in a better place" or "expired" or "moved on". It is also wise to remember the stages of grief and that the family might react with angry aggressive behaviors as well as sadness and depression. These behaviors might be directed at EMS personnel.

One question that is commonly asked by survivors is; "What should we do now?" Do not attempt to explain about whether this might be a Coroner's case or not and how that might or might not affect the disposition. Instead always direct the grieving persons to draw together for support ("Can we call somebody for you?" "Is there somebody who can come and stay with you?") Then direct them toward funeral planning. A funeral director is a professional who is well versed on disposal of human remains. The family does not need to worry about the legal necessities required for disposal of human remains. By making one call to a funeral home all

the family's needs can be met. As a professional, the funeral director will help the family choose between burial or cremation or the type of funeral service they would like if they would like any service at all. It is the job of the funeral director to liaison between the Coroner and the family and ensures all the necessary paperwork is taken care of. A funeral director does not have to be contacted immediately, but eventually this is where they will need to go. Sometimes the family has already purchased a funeral plan and the choices have already been made.

Sudden Infant Death Syndrome (SIDS) has its own considerations. A normal baby is laid down to sleep and is later found dead. SIDS is always unexpected and always very emotional. (Babies are not supposed to just die) Nobody knows exactly what causes SIDS but it has been seen that by positioning babies on their back for sleep the rate of SIDS has declined.

From a paramedic point of view the run will be for an infant in full arrest. During the initial assessment Paramedics should carefully look for criteria that could allow them to determine death (rigor and lividty). If it is seen, DO NOT attempt resuscitation. The baby is dead and cannot be revived. Despite the emotional aspects of the event no good can come from false hope and the transport of a corpse. Instead notify the family of the death and allow them to begin grieving.

Infant deaths are always Coroner's cases. Leaving the body on scene ensures that when the Coroner arrives to investigate, it is reflective of the conditions that existed at the time of death. This will greatly aid the Coroner in understanding what happened and possibly solving the mystery of SIDS and perhaps saving other infants someday.

If the baby shows rigor and lividity and you determine death per Ref #814 then is no base contact is required. However, because of the emotional aspects of an infant death or if any questions arise, feel free to contact the base hospital. Of course if the infant is NOT showing signs of obvious death (no rigor or lividity?) then resuscitation should be performed and base contact made.

There is one other situation that can exist around a death bed situation. A POLST form has several sections. The first is an area to describe whether the person wants resuscitation procedures (DNR). The next area describes the medical interventions the patient wants to receive. One box states "Comfort Measures Only". It instructs responders to use any means possible to relieve pain and suffering. This includes the use of analgesic medications. (Other informational sheets describe how to assess for pain). LA Co Ref #815 reminds Paramedics that if this box is checked they can and should (via Ref #806 or with orders from a base hospital) administer whatever medications are appropriate to relieve pain, dyspnea or treat hemorrhage. After treatment, it is NOT necessary to transport the patient to the hospital. If comfort measures were able to meet the patient's needs then there is no reason for transport, leave them on scene.

**All text from References 814 and 815 has been edited for clarity and flow. Please consult the original polices to view the exact wording.*

HIPAA PERMITS DISCLOSURE OF POLST TO OTHER HEALTH CARE PROVIDERS AS NECESSARY

Physician Orders for Life-Sustaining Treatment (POLST)

EMSA #111 B
(Effective 4/1/2011)

First follow these orders, then contact physician. This is a Physician Order Sheet based on the person's current medical condition and wishes. Any section not completed implies full treatment for that section. A copy of the signed POLST form is legal and valid. POLST complements an Advance Directive and is not intended to replace that document. Everyone shall be treated with dignity and respect.

Patient Last Name:	Date Form Prepared:
Patient First Name:	Patient Date of Birth:
Patient Middle Name:	Medical Record #: *(optional)*

A — CARDIOPULMONARY RESUSCITATION (CPR): *If person has no pulse and is not breathing. When NOT in cardiopulmonary arrest, follow orders in Sections B and C.*

Check One

☐ **Attempt Resuscitation/CPR** (Selecting CPR in Section A **requires** selecting Full Treatment in Section B)

☐ **Do Not Attempt Resuscitation/DNR** (**A**llow **N**atural **D**eath)

B — MEDICAL INTERVENTIONS: *If person has pulse and/or is breathing.*

Check One

☐ **Comfort Measures Only** Relieve pain and suffering through the use of medication by any route, positioning, wound care and other measures. Use oxygen, suction and manual treatment of airway obstruction as needed for comfort. ***Transfer to hospital only*** *if comfort needs cannot be met in current location.*

☐ **Limited Additional Interventions** In addition to care described in Comfort Measures Only, use medical treatment, antibiotics, and IV fluids as indicated. Do not intubate. May use non-invasive positive airway pressure. Generally avoid intensive care.

☐ ***Transfer to hospital only*** *if comfort needs cannot be met in current location.*

☐ **Full Treatment** In addition to care described in Comfort Measures Only and Limited Additional Interventions, use intubation, advanced airway interventions, mechanical ventilation, and defibrillation/ cardioversion as indicated. ***Transfer to hospital*** *if indicated. Includes intensive care.*

Additional Orders: _____

_____

C — ARTIFICIALLY ADMINISTERED NUTRITION: *Offer food by mouth if feasible and desired.*

Check One

☐ No artificial means of nutrition, including feeding tubes.

☐ Trial period of artificial nutrition, including feeding tubes.

☐ Long-term artificial nutrition, including feeding tubes.

Additional Orders: _____

_____

_____

D — INFORMATION AND SIGNATURES:

Discussed with: ☐ Patient (Patient Has Capacity) ☐ Legally Recognized Decisionmaker

☐ Advance Directive dated _____ available and reviewed →

☐ Advance Directive not available

☐ No Advance Directive

Health Care Agent if named in Advance Directive:
Name: _____
Phone: _____

Signature of Physician

My signature below indicates to the best of my knowledge that these orders are consistent with the person's medical condition and preferences.

Print Physician Name:	Physician Phone Number:	Physician License Number:
Physician Signature: *(required)*		Date:

Signature of Patient or Legally Recognized Decisionmaker

By signing this form, the legally recognized decisionmaker acknowledges that this request regarding resuscitative measures is consistent with the known desires of, and with the best interest of, the individual who is the subject of the form.

Print Name:		Relationship: *(write self if patient)*
Signature: *(required)*		Date:
Address:	Daytime Phone Number:	Evening Phone Number:

SEND FORM WITH PERSON WHENEVER TRANSFERRED OR DISCHARGED

HIPAA PERMITS DISCLOSURE OF POLST TO OTHER HEALTH CARE PROVIDERS AS NECESSARY

Patient Information

Name (last, first, middle):	Date of Birth:	Gender: M F

Health Care Provider Assisting with Form Preparation

Name:	Title:	Phone Number:

Additional Contact

Name:	Relationship to Patient:	Phone Number:

Directions for Health Care Provider

Completing POLST

- Completing a POLST form is voluntary. California law requires that a POLST form be followed by health care providers, and provides immunity to those who comply in good faith. In the hospital setting, a patient will be assessed by a physician who will issue appropriate orders.
- POLST does not replace the Advance Directive. When available, review the Advance Directive and POLST form to ensure consistency, and update forms appropriately to resolve any conflicts.
- POLST must be completed by a health care provider based on patient preferences and medical indications.
- A legally recognized decisionmaker may include a court-appointed conservator or guardian, agent designated in an Advance Directive, orally designated surrogate, spouse, registered domestic partner, parent of a minor, closest available relative, or person whom the patient's physician believes best knows what is in the patient's best interest and will make decisions in accordance with the patient's expressed wishes and values to the extent known.
- POLST must be signed by a physician and the patient or decisionmaker to be valid. Verbal orders are acceptable with follow-up signature by physician in accordance with facility/community policy.
- Certain medical conditions or treatments may prohibit a person from residing in a residential care facility for the elderly.
- If a translated form is used with patient or decisionmaker, attach it to the signed English POLST form.
- Use of original form is strongly encouraged. Photocopies and FAXes of signed POLST forms are legal and valid. A copy should be retained in patient's medical record, on Ultra Pink paper when possible.

Using POLST

- Any incomplete section of POLST implies full treatment for that section.

Section A:

- If found pulseless and not breathing, no defibrillator (including automated external defibrillators) or chest compressions should be used on a person who has chosen "Do Not Attempt Resuscitation."

Section B:

- When comfort cannot be achieved in the current setting, the person, including someone with "Comfort Measures Only," should be transferred to a setting able to provide comfort (e.g., treatment of a hip fracture).
- Non-invasive positive airway pressure includes continuous positive airway pressure (CPAP), bi-level positive airway pressure (BiPAP), and bag valve mask (BVM) assisted respirations.
- IV antibiotics and hydration generally are not "Comfort Measures."
- Treatment of dehydration prolongs life. If person desires IV fluids, indicate "Limited Interventions" or "Full Treatment."
- Depending on local EMS protocol, "Additional Orders" written in Section B may not be implemented by EMS personnel.

Reviewing POLST

It is recommended that POLST be reviewed periodically. Review is recommended when:

- The person is transferred from one care setting or care level to another, or
- There is a substantial change in the person's health status, or
- The person's treatment preferences change.

Modifying and Voiding POLST

- A patient with capacity can, at any time, request alternative treatment.
- A patient with capacity can, at any time, revoke a POLST by any means that indicates intent to revoke. It is recommended that revocation be documented by drawing a line through Sections A through D, writing "VOID" in large letters, and signing and dating this line.
- A legally recognized decisionmaker may request to modify the orders, in collaboration with the physician, based on the known desires of the individual or, if unknown, the individual's best interests.

This form is approved by the California Emergency Medical Services Authority in cooperation with the statewide POLST Task Force. For more information or a copy of the form, visit **www.caPOLST.org**.

SEND FORM WITH PERSON WHENEVER TRANSFERRED OR DISCHARGED

CMA PUBLICATIONS 1(800) 882-1262 WWW.CMANET.ORG

EMERGENCY MEDICAL SERVICES
PREHOSPITAL DO NOT RESUSCITATE (DNR) FORM

An Advance Request to Limit the Scope of Emergency Medical Care

I, _____, request limited emergency care as herein described.
(print patient's name)

I understand DNR means that if my heart stops beating or if I stop breathing, no medical procedure to restart breathing or heart functioning will be instituted.

I understand this decision will **not** prevent me from obtaining other emergency medical care by prehospital emergency medical care personnel and/or medical care directed by a physician prior to my death.

I understand I may revoke this directive at any time by destroying this form and removing any "DNR" medallions.

I give permission for this information to be given to the prehospital emergency care personnel, doctors, nurses or other health personnel as necessary to implement this directive.

I hereby agree to the "Do Not Resuscitate" (DNR) order.

_____ _____
Patient/Legally Recognized Health Care Decisionmaker Signature Date

_____
Legally Recognized Health Care Decisionmaker's Relationship to Patient

By signing this form, the legally recognized health care decisionmaker acknowledges that this request to forego resuscitative measures is consistent with the known desires of, and with the best interest of, the individual who is the subject of the form.

I affirm that this patient/legally recognized health care decisionmaker is making an informed decision and that this directive is the expressed wish of the patient/legally recognized health care decisionmaker. A copy of this form is in the patient's permanent medical record.

In the event of cardiac or respiratory arrest, no chest compressions, assisted ventilations, intubation, defibrillation, or cardiotonic medications are to be initiated.

_____ _____
Physician Signature Date

_____ _____
Print Name Telephone

THIS FORM WILL NOT BE ACCEPTED IF IT HAS BEEN AMENDED OR ALTERED IN ANY WAY

PREHOSPITAL DNR REQUEST FORM

White Copy: To be kept by patient
Yellow Copy: To be kept in patient's permanent medical record
Pink Copy: If authorized DNR medallion desired, submit this form with Medic Alert enrollment form to: Medic Alert Foundation, Turlock, CA 95381

FINAL ATTESTATION FOR AN AID-IN-DYING DRUG TO END MY LIFE IN A HUMANE AND DIGNIFIED MANNER

I, ***Patient Name,*** am an adult of sound mind and a resident of the State of California.

I am suffering from _____, which my attending physician has determined is in its terminal phase and which has been medically confirmed.

I have been fully informed of my diagnosis and prognosis, the nature of the aid-in-dying drug to be prescribed and potential associated risks, the expected result, and the feasible alternatives or additional treatment options, including comfort care, palliative care, and pain control.

I have received the aid-in-dying drug and am fully aware that this aid-in-dying drug will end my life in a humane and dignified manner.

INITIAL ONE:

_____ I have informed one or more members of my family of my decision and taken their opinions into consideration.

_____ I have decided not to inform my family of my decision.

_____ I have no family to inform of my decision.

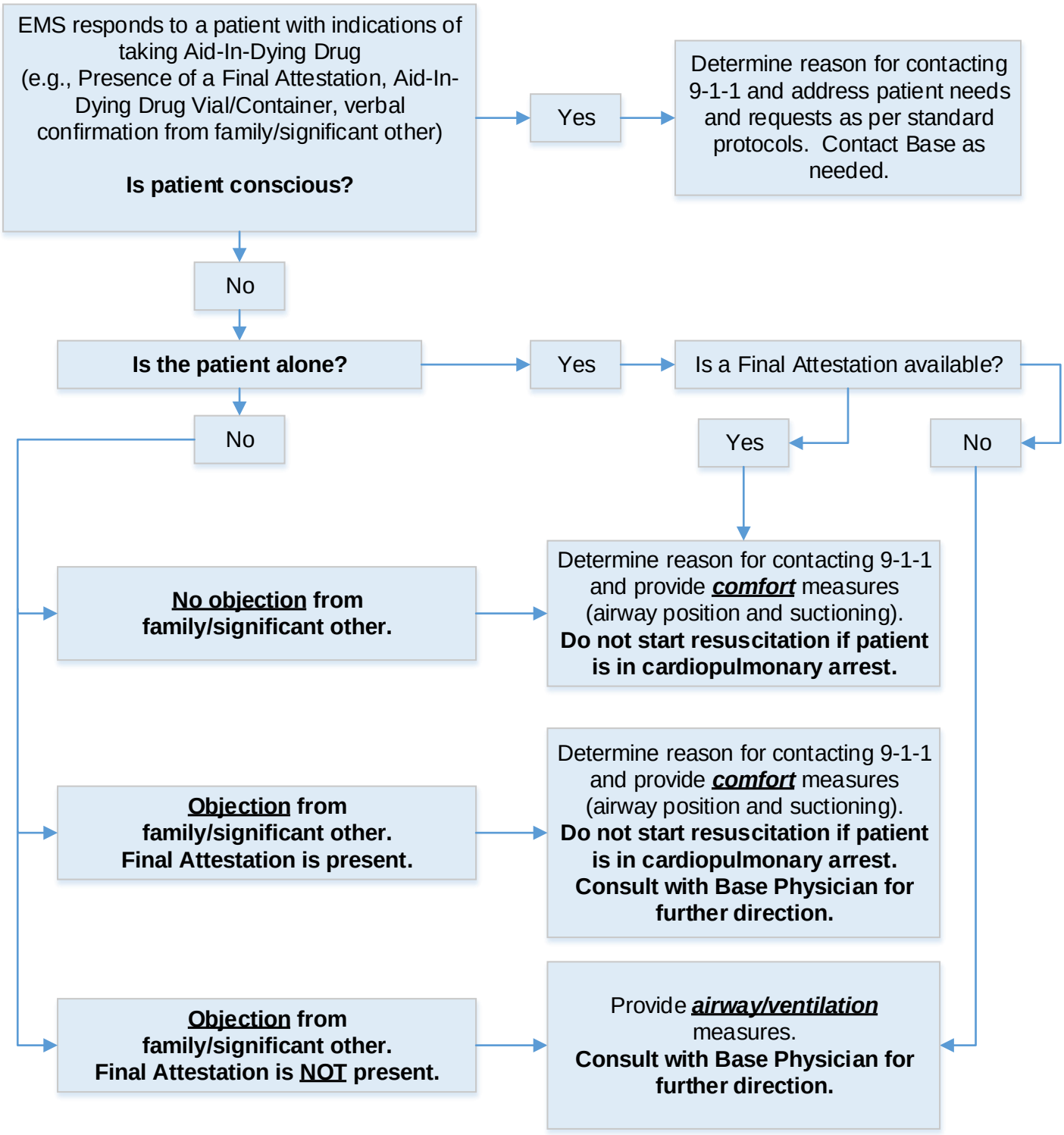
My attending physician has counseled me about the possibility that my death may not be immediately upon the consumption of the drug.

I make this decision to ingest the aid-in-dying drug to end my life in a humane and dignified matter. I understand I still may choose not to ingest the drug and by signing this form I am under no obligation to ingest the drug. I understand I may rescind this request at any time.

Signed: _____

Dated: _____

Time: _____


EMS responds to a patient with indications of taking Aid-In-Dying Drug (e.g., Presence of a Final Attestation, Aid-In-Dying Drug Vial/Container, verbal confirmation from family/significant other)
Is patient conscious?
Yes
Determine reason for contacting 9-1-1 and address patient needs and requests as per standard protocols. Contact Base as needed.
No
Is the patient alone?
Yes
Is a Final Attestation available?
Yes
No
No
No objection from family/significant other.
Determine reason for contacting 9-1-1 and provide comfort measures (airway position and suctioning). Do not start resuscitation if patient is in cardiopulmonary arrest.
Objection from family/significant other. Final Attestation is present.
Determine reason for contacting 9-1-1 and provide comfort measures (airway position and suctioning). Do not start resuscitation if patient is in cardiopulmonary arrest. Consult with Base Physician for further direction.
Objection from family/significant other. Final Attestation is NOT present.
Provide airway/ventilation measures. Consult with Base Physician for further direction.

GUIDE TO SUSPECTED CHILD ABUSE REPORTING

1. **NOTIFY** law enforcement **IMMEDIATELY** if the child is suspected to be in imminent danger.

2. **CALL** the 24-hour Child Protection Hotline at **1 (800) 540-4000** as soon as possible to make the verbal report to the **Department of Child and Family Services (DCFS)**.

   - You will be given a **REFERRAL NUMBER,** which is also the Case Number.

3. **COMPLETE** the **Suspected Child Abuse Report** (SCAR) form SS8572 **within 36 hours** and **submit to DCFS** via ONE of the following ways:

   - **Mail: Department of Child and Family Services (DCFS)**
     1933 S. Broadway Avenue, 5th Floor, Los Angeles, CA 90007

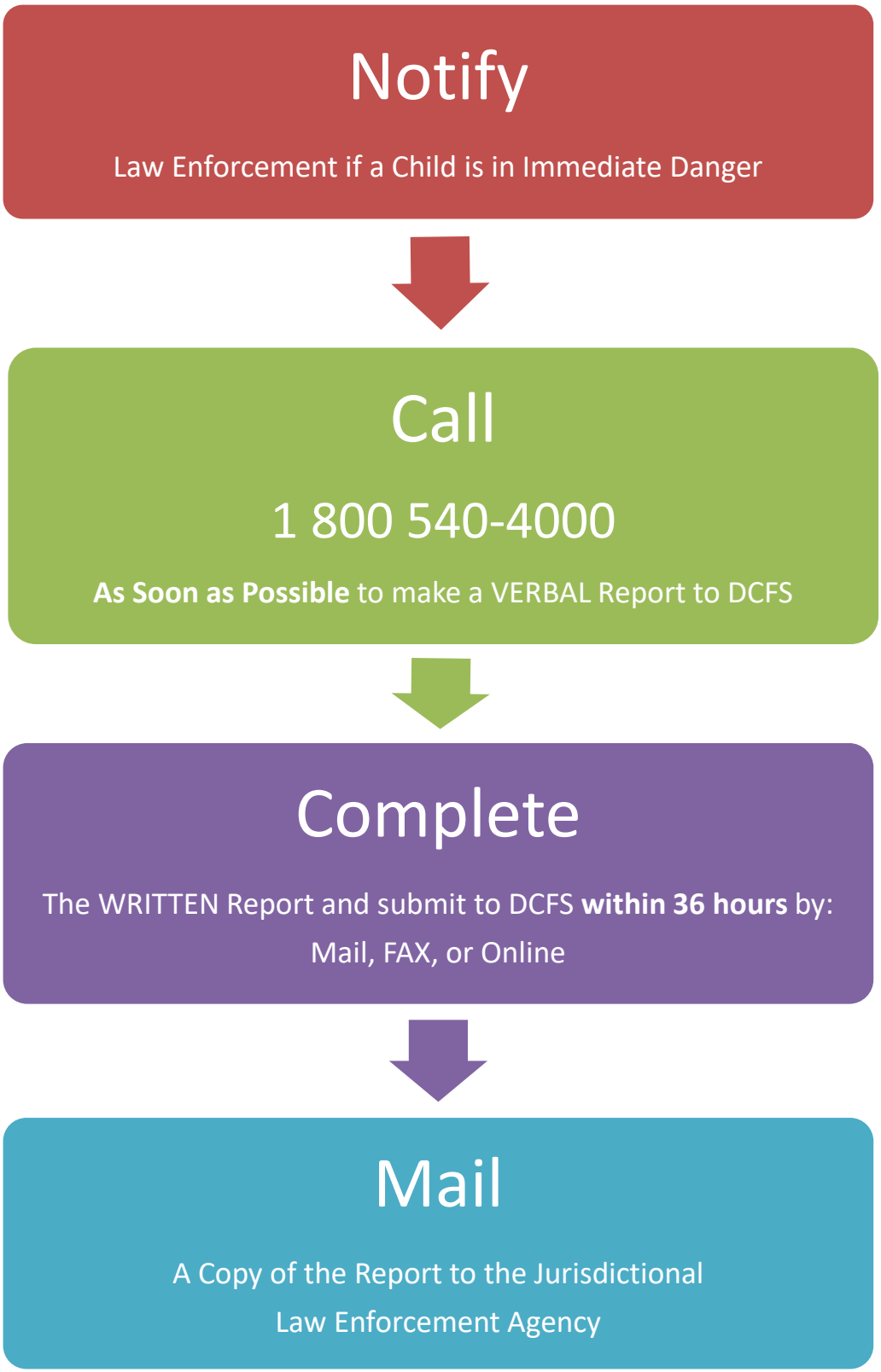
   - **Fax: 1 (213) 745-1727 or (213) 745-1728**

   - **Online:**

     1. **dcfs.lacounty.gov**
     2. On the left-hand side, under RESOURCES, click on “For Mandated Reporters Only (Complete your Mandated Report Online)”
     3. Enter the REFERRAL NUMBER and proceed

   Keep a copy for yourself, and a copy to mail to local law enforcement.

4. **MAIL** (or FAX if available) a copy of the completed **Suspected Child Abuse Report** to the jurisdictional law enforcement agency.


Notify
Law Enforcement if a Child is in Immediate Danger
Call
1 800 540-4000
As Soon as Possible to make a VERBAL Report to DCFS
Complete
The WRITTEN Report and submit to DCFS within 36 hours by:
Mail, FAX, or Online
Mail
A Copy of the Report to the Jurisdictional
Law Enforcement Agency

CONFIDENTIAL REPORT - NOT SUBJECT TO PUBLIC DISCLOSURE

REPORT OF SUSPECTED DEPENDENT ADULT/ELDER ABUSE

DATE COMPLETED

TO BE COMPLETED BY REPORTING PARTY. PLEASE PRINT OR TYPE. SEE GENERAL INSTRUCTIONS.

A. VICTIM Check box if victim consents to disclosure of information (Ombudsman use only - WIC 15636(a))

NAME (LAST NAME, FIRST NAME) | AGE | DATE OF BIRTH

SSN | GENDER M F | ETHNICITY | LANGUAGE (v″ CHECK ONE) NON-VERBAL ENGLISH OTHER *(SPECIFY)*

ADDRESS (IF FACILITY, INCLUDE NAME AND NOTIFY OMBUDSMAN) | CITY | ZIP CODE | TELEPHONE ( )

PRESENT LOCATION (IF DIFFERENT FROM ABOVE) | CITY | ZIP CODE | TELEPHONE ( )

ELDERLY (65+) DEVELOPMENTALLY DISABLED MENTALLY ILL/DISABLED LIVES ALONE
PHYSICALLY DISABLED UNKNOWN/OTHER LIVES WITH OTHERS

B. SUSPECTED ABUSER v″ *Check if Self-Neglect*

NAME OF SUSPECTED ABUSER

ADDRESS | CITY | ZIP CODE | TELEPHONE ( )

CARE CUSTODIAN (type) _____ PARENT SON/DAUGHTER OTHER _____
HEALTH PRACTITIONER (type) _____ SPOUSE OTHER RELATION _____

GENDER M F | ETHNICITY | AGE | D.O.B. | HEIGHT | WEIGHT | EYES | HAIR

C. REPORTING PARTY *Check appropriate box if reporting party waives confidentiality to:* v″ All v″ All but victim v″ All but perpetrator

NAME | SIGNATURE | OCCUPATION | AGENCY/NAME OF BUSINESS

RELATION TO VICTIM/HOW ABUSE IS KNOWN | STREET | CITY | ZIP CODE | TELEPHONE ( )

E-MAIL ADDRESS

D. INCIDENT INFORMATION - Address where incident occurred

DATE/TIME OF INCIDENT(S)

PLACE OF INCIDENT (v″ CHECK ONE)
OWN HOME COMMUNITY CARE FACILITY HOSPITAL/ACUTE CARE HOSPITAL
HOME OF ANOTHER NURSING FACILITY/SWING BED OTHER (Specify)

E. REPORTED TYPES OF ABUSE (v″ CHECK ALL THAT APPLY)

1. PERPETRATED BY OTHERS (WIC 15610.07 & 15610.63)

a. PHYSICAL (e.g. assault/battery, constraint or deprivation, chemical restraint, over/under medication)
b. SEXUAL
c. FINANCIAL
d. NEGLECT (including Deprivation of Goods and Services by a Care Custodian
e. ABANDONMENT
f. ISOLATION
g. ABDUCTION
h. PSYCHOLOGICAL/MENTAL
i. OTHER _____

2. SELF-NEGLECT (WIC 15610.57(b)(5))

a. PHYSICAL CARE (e.g. personal hygiene, food, clothing, shelter)
b. MEDICAL CARE (e.g. physical and mental health needs)
c. HEALTH and SAFETY HAZARDS (e.g. risk of suicide, unsafe environment)
d. MALNUTRITION/DEHYDRATION
e. FINANCIAL SELF-NEGLECT (e.g. inability to manage one's own personal finances)
f. OTHER _____

ABUSE RESULTED IN (v″ CHECK ALL THAT APPLY)

NO PHYSICAL INJURY MINOR MEDICAL CARE HOSPITALIZATION CARE PROVIDER REQUIRED
DEATH MENTAL SUFFERING SERIOUS BODILY INJURY* OTHER (SPECIFY) _____
UNKNOWN

DEPARTMENT OF HEALTH SERVICES
COUNTY OF LOS ANGELES

SUBJECT: **9-1-1 RECEIVING HOSPITAL DIRECTORY** REFERENCE NO. 501

HOSPITAL NAME ADDRESS PHONE	HOSP. CODE	BASE HOSP.	TRAUMA LEVEL	PTC/ PMC	EDAP	PERINATAL	NICU	SRC	PSC	CSC	BURN	HELIPAD	SPECIAL SERVICES
Adventist Health Glendale 1509 East Wilson Terrace Glendale, CA 91206 (818) 409-8000	GWT	X			X	X	X	X	X	X		X	
Adventist Health - White Memorial 1720 Caesar Chavez Avenue Los Angeles, CA 90033 (323) 268-5000	WMH			PMC	X	X	X	X	X				Service Area
Alhambra Hospital 100 South Raymond Avenue Alhambra, CA 91801 (626) 570-1606	ACH												
Antelope Valley Hospital 1600 West Avenue J Lancaster, CA 93534 (661) 949-5000	AVH	X	Level II		X	X	X	X	X			X	SART Center
Beverly Hospital 309 West Beverly Boulevard Montebello, CA 90640 (323) 726-1222	BEV				X	X		X	X				
Catalina Island Medical Center 100 Falls Canyon Road Avalon, CA 90704 (310) 510-0700	AHM												
Cedars Sinai Medical Center 8700 Beverly Boulevard Los Angeles, CA 90048 (310) 855-5000	CSM	X	Level I Pediatric Level II	PTC PMC	X	X	X	X	X	X		X	
Cedars Sinai Marina Del Rey Hospital 4650 Lincoln Boulevard Marina Del Rey, CA 90291 (310) 823-8911	DFM												
Centinela Hospital Medical Center 555 East Hardy Street Inglewood, CA 90301 (310) 673-4660	CNT				X	X	X		X				Service Area
Children's Hospital Los Angeles 4650 Sunset Boulevard Los Angeles, CA 90027 (323) 660-2450	CHH		Pediatric Level I ONLY	PTC PMC	X		X					X	

SUBJECT: **9-1-1 RECEIVING HOSPITAL DIRECTORY** REFERENCE NO. 501

HOSPITAL NAME ADDRESS PHONE	HOSP. CODE	BASE HOSP.	TRAUMA LEVEL	PTC/ PMC	EDAP	PERINATAL	NICU	SRC	PSC	CSC	BURN	HELIPAD	SPECIAL SERVICES
Coast Plaza Doctors Hospital 13100 Studebaker Road Norwalk, CA 90650 (562) 868-3751	CPM								X				
College Medical Center 2776 Pacific Avenue Long Beach, CA 90806 (562) 595-1911	PLB												
Community Hospital of Huntington Park 2623 E. Slauson Ave. Huntington Park, CA 90023 (323) 583-1931	CHP												
Dignity Health-California Hospital Medical Center 1401 South Grand Avenue Los Angeles, CA 90015 (213) 748-2411	CAL	X	Level II		X	X	X		X			X	
Dignity Health-Glendale Memorial Hospital and Health Center 1420 South Central Avenue Glendale, CA 91204 (818) 502-1900	GMH				X	X	X	X	X				
Dignity Health-Northridge Hospital Medical Center 18300 Roscoe Boulevard Northridge, CA 91328 (818) 885-8500	NRH	X	Level II Pediatric Level II	PTC PMC	X	X	X	X	X	X		X	SART Center Approved for Law Enforcement ONLY
Dignity Health-St. Mary Medical Center 1050 Linden Avenue Long Beach, CA 90813 (562) 491-9000	SMM	X	Level II		X	X	X	X	X			X	
East Los Angeles Doctors Hospital 4060 East Whittier Boulevard Los Angeles, CA 90023 (323) 268-5514	ELA					X							
Emanate Health Foothill Presbyterian Hospital 250 South Grand Avenue Glendora, CA 91749 (626) 963-8411	FPH					X						X	
Emanate Health Inter-Community Hospital 210 West San Bernardino Road Covina, CA 91723 (626) 331-7331	ICH							X					

SUBJECT: **9-1-1 RECEIVING HOSPITAL DIRECTORY** REFERENCE NO. 501

HOSPITAL NAME ADDRESS PHONE	HOSP. CODE	BASE HOSP.	TRAUMA LEVEL	PTC/ PMC	EDAP	PERINATAL	NICU	SRC	PSC	CSC	BURN	HELIPAD	SPECIAL SERVICES
Emanate Health Queen of the Valley Hospital 1115 South Sunset Avenue West Covina, CA 91790 (626) 962-4011	QVH	X			X	X	X		X				SART Center
Encino Hospital Medical Center 16237 Ventura Boulevard Encino, CA 91436 (818) 995-5000	ENH				X				X				
Garfield Medical Center 525 North Garfield Avenue Monterey Park, CA 91754 (626) 573-2222	GAR					X	X	X	X				
Glendora Community Hospital 150 W. Route 66 Glendora, CA 91740 (626) 335-0231	HEV												
Good Samaritan Hospital 1225 Wilshire Blvd. Los Angeles, CA 90017 (213) 977-2121	GSH					X	X	X	X	X		X	Service Area
Greater El Monte Community Hospital 1701 Santa Anita Avenue South El Monte, CA 91733 (626) 579-7777	GEM					X							
Henry Mayo Newhall Hospital 23845 West McBean Parkway Valencia, CA 91355 (661) 253-8000	HMN	X	**Level II**		X	X		X	X			X	
Hollywood Presbyterian Medical Center 1300 North Vermont Avenue Los Angeles, CA 90027 (323) 413-3000	QOA					X	X	X	X			X	
Huntington Hospital 100 West California Boulevard Pasadena, CA 91105 (626) 397-5000	HMH	X	**Level II**		X	X	X	X	X	X		X	
Kaiser Foundation - Baldwin Park 1011 Baldwin Park Boulevard Baldwin Park, CA 91706 (626) 851-1011	KFA					X	X		X				
Kaiser Foundation - Downey 9333 Imperial Highway Downey, CA 90242 (562) 920-3023	KFB					X	X		X				

SUBJECT: **9-1-1 RECEIVING HOSPITAL DIRECTORY** REFERENCE NO. 501

HOSPITAL NAME ADDRESS PHONE	HOSP. CODE	BASE HOSP.	TRAUMA LEVEL	PTC/ PMC	EDAP	PERINATAL	NICU	SRC	PSC	CSC	BURN	HELIPAD	SPECIAL SERVICES
Kaiser Foundation - Los Angeles 4867 Sunset Boulevard Los Angeles, CA 90027 (323) 783-4011	KFL					X	X		X	X			
Kaiser Foundation - Panorama City 13652 Cantara Street Panorama City, CA 91402 (818) 375-2000	KFP					X			X				
Kaiser Foundation – South Bay 25825 South Vermont Avenue Harbor City, CA 90710 (310) 325-5111	KFH					X	X		X				
Kaiser Foundation - West Los Angeles 6041 Cadillac Avenue Los Angeles, CA 90034 (323) 857-2000	KFW					X	X		X				
Kaiser Foundation - Woodland Hills 5601 De Soto Avenue Woodland Hills, CA 91367 (818) 719-2000	KFO					X	X		X				
LAC Harbor-UCLA Medical Center 1000 West Carson Street Torrance, CA 90502 (310) 222-2345	HGH	X	**Level I Pediatric Level II**	**PTC PMC**	X	X	X	X				X	SART Center for DCFS only
LAC Olive View Medical Center 14445 Olive View Drive Sylmar, CA 91342 (818) 364-1555	OVM				X	X	X					X	SART Center for DCFS only
LAC + USC Medical Center 1200 North State Street Los Angeles, CA 90033 (323) 226-2622	USC	X	**Level I Pediatric Level II**	**PTC PMC**	X	X	X	X	X		X	X	Hyperbaric Chamber- Catalina Isthmus SART Center
Lakewood Regional Medical Center 3700 S. Street Lakewood, CA 90712 (562) 531-2550	DHL							X	X				
Long Beach Memorial Medical Center 2801 Atlantic Avenue Long Beach, CA 90806 (562) 933-2000	LBM	X	**Level II Pediatric Level II**	**PTC PMC**	X	X	X	X	X	X		X	
Los Angeles Community Hospital at Norwalk 13222 Bloomfield Avenue Norwalk, CA 90650 (562) 863-4763	NOR												

SUBJECT: **9-1-1 RECEIVING HOSPITAL DIRECTORY** REFERENCE NO. 501

HOSPITAL NAME ADDRESS PHONE	HOSP. CODE	BASE HOSP.	TRAUMA LEVEL	PTC/ PMC	EDAP	PERINATAL	NICU	SRC	PSC	CSC	BURN	HELIPAD	SPECIAL SERVICES
Martin Luther King, Jr. Community Hospital 1680 East 120th Street Los Angeles, CA 90059 (424) 388-8000	MLK					X							SART Center for DCFS only
Memorial Hospital of Gardena 1145 West Redondo Beach Boulevard Gardena, CA 90247 (310) 532-4200	MHG					X			X				
Methodist Hospital of Southern California 300 West Huntington Drive Arcadia, CA 91007 (626) 898-8000	AMH	X			X	X	X	X	X	X			
Mission Community Hospital 14850 Roscoe Boulevard Panorama City, CA 91402 (818) 787-2222	MCP								X				
Monterey Park Hospital 900 South Atlantic Boulevard Monterey Park, CA 91754 (626) 570-9000	MPH					X							
Olympia Medical Center 5900 West Olympic Boulevard Los Angeles, CA 90036 (310) 657-5900	MID												
Pacifica Hospital of the Valley 9449 San Fernando Road Sun Valley, CA 91352 (818) 767-3310	PAC												
Palmdale Regional Medical Center 38600 Medical Center Drive Palmdale, CA 93551 (661) 382-5000	LCH							X	X				
PIH Health Hospital-Downey 11500 Brookshire Avenue Downey, CA 90241 (562) 904-5000	DCH				X	X	X		X				
PIH Health Hospital - Whittier 12401 East Washington Boulevard Whittier, CA 90602 (562) 698-0811	PIH	X			X	X	X	X	X	X		X	SART Center
Pomona Valley Hosp. Medical Center 1798 North Garey Avenue Pomona, CA 91767 (909) 623-8715	PVC	X	**Level II**		X	X	X	X	X	X			SART Center

SUBJECT: **9-1-1 RECEIVING HOSPITAL DIRECTORY** REFERENCE NO. 501

HOSPITAL NAME ADDRESS PHONE	HOSP. CODE	BASE HOSP.	TRAUMA LEVEL	PTC/ PMC	EDAP	PERINATAL	NICU	SRC	PSC	CSC	BURN	HELIPAD	SPECIAL SERVICES
Providence Holy Cross Medical Center 15031 Rinaldi Street Mission Hills, CA 91345 (818) 365-8051	HCH	X	Level II		X	X	X	X	X			X	
Providence Little Company of Mary Medical Center - San Pedro 1300 West Seventh Street San Pedro, CA 90732 (310) 832-3311	SPP				X	X			X				SART Center
Providence Little Company of Mary Medical Center - Torrance 4101 Torrance Boulevard Torrance, CA 90503 (310) 540-7676	LCM	X			X	X	X	X	X	X			
Providence Saint John's Health Center 2121 Santa Monica Blvd. Santa Monica, CA 90404 (310) 829-5511	SJH					X	X	X	X	X			
Providence Saint Joseph Medical Center 501 South Buena Vista Street Burbank, CA 91505 (818) 843-5111	SJS	X			X	X	X	X	X	X		X	
Providence Tarzana Medical Center 18321 Clark Street Tarzana, CA 91356 (818) 881-0800	TRM			PMC	X	X	X	X	X				
Ronald Reagan UCLA Medical Center 757 Westwood Plaza Los Angeles, CA 90095 (310) 825-9111	UCL	X	Level I Pediatric Level I	PTC PMC	X	X	X	X	X	X		X	
San Dimas Community Hospital 1350 West Covina Boulevard San Dimas, CA 91773 (909) 599-6811	SDC					X							
San Gabriel Valley Medical Center 438 West La Tunas Drive San Gabriel, CA 91776 (626) 289-5454	SGC					X	X						SART Center
Santa Monica-UCLA Medical Center 1250 16th Street Santa Monica, CA 90404 (310) 319-4000	SMH				X	X	X	X	X				SART Center

Department of Health Services
County of Los Angeles

SUBJECT: **9-1-1 RECEIVING HOSPITAL DIRECTORY** REFERENCE NO. 501

HOSPITAL NAME ADDRESS PHONE	HOSP. CODE	BASE HOSP.	TRAUMA LEVEL	PTC/ PMC	EDAP	PERINATAL	NICU	SRC	PSC	CSC	BURN	HELIPAD	SPECIAL SERVICES
Sherman Oaks Hospital 4929 Van Nuys Boulevard Sherman Oaks, CA 91403 (818) 981-7111	SOC				X				X			X	
Southern California Hospital at Culver City 3828 Delmar Terrace Culver City, CA 90231 (310) 836-7000	BMC												
St. Francis Medical Center 3630 East Imperial Highway Lynwood, CA 90262 (310) 900-8900	SFM	X	**Level II**		X	X	X	X	X			X	
St. Vincent Medical Center 2131 West 3rd Street Los Angeles, CA 90057 (213) 484-7111	SVH							X					Service Area
Torrance Memorial Medical Center 3330 West Lomita Boulevard Torrance, CA 90505 (310) 325-9110	TOR	X			X	X	X	X	X	X	X		
USC Verdugo Hills Hospital 1812 Verdugo Boulevard Glendale, CA 91208 (818) 790-7100	VHH				X	X			X			X	
Valley Presbyterian Hospital 15107 Van Owen Street Van Nuys, CA 91405 (818) 782-6600	VPH			**PMC**	X	X	X	X	X				
West Hills Hospital and Medical Center 7300 Medical Center Drive West Hills, CA 91307 (818) 676-4000	HWH				X	X	X	X	X		X		
Whittier Hospital Medical Center 9080 Colima Road Whittier, CA 90605 (562) 945-3561	WHH					X							

SUBJECT: **9-1-1 RECEIVING HOSPITAL DIRECTORY** REFERENCE NO. 501

*** OUT OF COUNTY RECEIVING HOSPITALS ***

HOSPITAL NAME ADDRES PHONE	HOSP CODE	BASE HOSP.	TRAUMA LEVEL	PTC/ PMC	EDAP	PERINATAL	NICU	SRC	PSC	CSC	BURN	HELIPAD	SPECIAL SERVICES
Chino Valley Medical Center (San Bernardino County) 5451 Walnut Avenue Chino, CA 91710 (909) 464-8600	CHI												
La Palma Intercommunity Hospital (Orange County) 7901 Walker Street La Palma, CA 90623 (714) 670-7400	LPI				X								
Los Robles Hospital & Medical Center (Ventura County) 215 West Janss Road Thousand Oaks, CA 91360 (805) 497-2727	LRR				X	X		X	X	X		X	
Los Alamitos Medical Center (Orange County) 3751 Katella Avenue Los Alamitos, CA 90720 (562) 598-1311	LAG								X	X			
San Antonio Community Hospital (San Bernardino County) 999 San Bernardino Road Upland, CA 91786 (909) 985-2811	SAC					X	X						
Saint John Regional Medical Center (Ventura County) 1600 North Rose Avenue Oxnard, CA 93030 (805) 988-2500	SJO					X						X	
Saint Jude Medical Center (Orange County) 101 East Valencia Mesa Drive Fullerton, CA 92635 (714) 871-3280	SJD					X	X	X	X	X			
UC Irvine Medical Center (Orange County) 101 The City Drive, R007E62 Orange, CA 92868 (714) 456-6011	UCI					X	X				X	X	

NATIONAL INCIDENT MANAGEMENT SYSTEM

National Incident Management System (NIMS) is the culmination of more than 40 years of efforts to improve interoperability in incident management. This work began in the 1970s with local, state, and Federal agencies collaborating to create a system called Firefighting Resources of California Organized for Potential Emergencies (FIRESCOPE). FIRESCOPE included ICS and the Multiagency Coordination System (MACS). In 1982, the agencies that developed FIRESCOPE and the National Wildfire Coordinating Group (NWCG) created the National Interagency Incident Management System (NIIMS), in part to make ICS guidance applicable to all types of incidents and all hazards. Under Homeland Security Presidential Directive #5 (February 2003), the Federal government created the National Incident Management System (NIMS). This system directed the creation of a comprehensive, national approach to incident management. Recognizing the value of these systems, communities across the Nation have adopted NIMS. The most current revision of NIMS was released in October 2017.

NIMS Management Characteristics

The following characteristics are the foundation of incident command and coordination under NIMS and contribute to the strength and efficiency of the overall system:

- Common Terminology
- Modular Organization
- Management by Objectives
- Incident Action Planning
- Manageable Span of Control
- Incident Facilities and Locations
- Comprehensive Resource Management
- Integrated Communications
- Establishment and Transfer of Command
- Unified Command
- Chain of Command and Unity of Command
- Accountability
- Dispatch/Deployment
- Information and Intelligence Management

Common Terminology

NIMS establishes common terminology that allows diverse incident management and support organizations to work together across a wide variety of functions and hazard scenarios. This common terminology covers the following:

- Organizational Functions: Major functions and functional units with incident responsibilities are named and defined. Terminology for incident organizational elements is standard and consistent.
- Resource Descriptions: Major resources—including personnel, equipment, teams, and facilities—are given common names and are typed to help avoid confusion and to enhance interoperability.
- Incident Facilities: Incident management facilities are designated using common terminology.

Modular Organization

ICS and EOC organizational structures develop in a modular fashion based on an incident's size, complexity, and hazard environment. Responsibility for establishing and expanding ICS organizations and EOC teams ultimately rests with the Incident Commander (or Unified Command) and EOC director. Responsibility for functions that subordinates perform defaults to the next higher supervisory position until the supervisor delegates those responsibilities. As incident complexity increases, organizations expand as the Incident Commander, Unified Command, EOC director, and subordinate supervisors delegate additional functional responsibilities.

Management by Objectives

The Incident Commander or Unified Command establishes objectives that drive incident operations. Management by objectives includes the following:

- Establishing specific, measurable objectives;
- Identifying strategies, tactics, tasks, and activities to achieve the objectives;
- Developing and issuing assignments, plans, procedures, and protocols for various incident management functional elements to accomplish the identified tasks; and
- Documenting results against the objectives to measure performance, facilitate corrective actions, and inform development of incident objectives for the subsequent operational period.

Incident Action Planning

Coordinated incident action planning guides incident management activities. IAPs represent concise, coherent means of capturing and communicating incident objectives, tactics, and assignments for operational and support activities.

Every incident should have an action plan; however, not all incidents need written plans. The necessity for written plans depends on incident complexity, command decisions, and legal requirements. Formal IAPs are not always developed for the initial operational period of no-notice incidents. However, if an incident is likely to extend beyond one operational period, becomes more complex, or involves multiple jurisdictions and/or agencies, preparing a written IAP becomes increasingly important to maintain unity of effort and effective, efficient, and safe operations.

Staff in EOCs also typically conduct iterative planning and produce plans to guide their activities during specified periods, though these are typically more strategic than IAPs.

Manageable Span of Control

Maintaining an appropriate span of control helps ensure an effective and efficient incident management operation. It enables management to direct and supervise subordinates and to communicate with and manage all resources under their control. The type of incident, nature of the task, hazards and safety factors, experience of the supervisor and subordinates, and communication access between the subordinates and the supervisor are all factors that influence manageable span of control.

The optimal span of control for incident management is one supervisor to five subordinates; however, effective incident management frequently necessitates ratios significantly different from this. The 1:5 ratio is a guideline, and incident personnel use their best judgment to determine the actual distribution of subordinates to supervisors for a given incident or EOC activation.

Incident Facilities and Locations

Depending on the incident size and complexity, the Incident Commander, Unified Command, and/or EOC director establish support facilities for a variety of purposes and direct their identification and location based on the incident. Typical facilities include the Incident Command Post (ICP), incident base, staging areas, camps, mass casualty triage areas, points-of-distribution, and emergency shelters.

Comprehensive Resource Management

Resources include personnel, equipment, teams, supplies, and facilities available or potentially available for assignment or allocation. Maintaining an accurate and up-to-date inventory of resources is an essential component of incident management. Section II, the Resource Management component of this document, describes this in more detail.

Integrated Communications

Leadership at the incident level and in EOCs facilitates communication through the development and use of a common communications plan, interoperable communications processes, and systems that include voice and data links. Integrated

communications provide and maintain contact among and between incident resources, enable connectivity between various levels of government, achieve situational awareness, and facilitate information sharing. Planning, both in advance of and during an incident, addresses equipment, systems, and protocols necessary to achieve integrated voice and data communications. Section IV, the Communications and Information Management component of this document, describes this in more detail.

Establishment and Transfer of Command

The Incident Commander or Unified Command should clearly establish the command function at the beginning of an incident. The jurisdiction or organization with primary responsibility for the incident designates the individual at the scene responsible for establishing command and protocol for transferring command. When command transfers, the transfer process includes a briefing that captures essential information for continuing safe and effective operations, and notifying all personnel involved in the incident.

Unified Command

When no one jurisdiction, agency or organization has primary authority and/or the resources to manage an incident on its own, Unified Command may be established. In Unified Command, there is no one “commander.” Instead, the Unified Command manages the incident by jointly approved objectives. A Unified Command allows these participating organizations to set aside issues such as overlapping and competing authorities, jurisdictional boundaries, and resource ownership to focus on setting clear priorities and objectives for the incident. The resulting unity of effort allows the Unified Command to allocate resources regardless of ownership or location. Unified Command does not affect individual agency authority, responsibility, or accountability.

Chain of Command and Unity of Command

Chain of command refers to the orderly line of authority within the ranks of the incident management organization. Unity of command means that each individual only reports to one person. This clarifies reporting relationships and reduces confusion caused by multiple, conflicting directives, enabling leadership at all levels to effectively direct the personnel under their supervision.

Accountability

Effective accountability for resources during an incident is essential. Incident personnel should adhere to principles of accountability, including check-in/check-out, incident action planning, unity of command, personal responsibility, span of control, and resource tracking.

Dispatch/Deployment

Resources should deploy only when appropriate authorities request and dispatch them through established resource management systems. Resources that authorities do not request should refrain from spontaneous deployment to avoid overburdening the recipient and compounding accountability challenges.

Information and Intelligence Management

The incident management organization establishes a process for gathering, analyzing, assessing, sharing, and managing incident-related information and intelligence. Information and intelligence management includes identifying essential elements of information (EEI) to ensure personnel gather the most accurate and appropriate data, translate it into useful information, and communicate it with appropriate personnel.

Note that in In NIMS, “intelligence” refers exclusively to threat-related information developed by law enforcement, medical surveillance, and other investigative organizations.

ICS HISTORY AND FEATURES

Incident Command System

ICS is a standardized approach to the command, control, and coordination of on-scene incident management that provides a common hierarchy within which personnel from multiple organizations can be effective. ICS specifies an organizational structure for incident management that integrates and coordinates a combination of procedures, personnel, equipment, facilities, and communications. Using ICS for every incident helps hone and maintain skills needed to coordinate efforts effectively. ICS is used by all levels of government as well as by many NGOs and private sector organizations. ICS applies across disciplines and enables incident managers from different organizations to work together seamlessly. This system includes five major functional areas, staffed as needed, for a given incident: Command, Operations, Planning, Logistics, and Finance/Administration. A sixth ICS Function, Intelligence/ Investigations, is only used when the incident requires these specialized capabilities.

Incident Complexity, Complex Incidents and Incident Complex

Incident Complexity is the combination of involved factors that affect the probability of control of an incident. Many factors determine the complexity of an incident, including, but not limited to, area involved, threat to life and property, political sensitivity, organizational complexity, jurisdictional boundaries, values at risk, weather, strategy and tactics, and agency policy. Incident complexity is considered when making incident management level, staffing, and safety decisions.

Incident complexity is assessed on a five-point scale ranging from Type 5 (the least complex incident) to Type 1 (the most complex incident).

Various analysis tools have been developed to assist consideration of important factors involved in incident complexity. Listed below are some of the factors that may be considered in analyzing incident complexity:

- Impacts to life, property, and the economy

- Community and responder safety
- Potential hazardous materials
- Weather and other environmental influences
- Likelihood of cascading events
- Potential crime scene (including terrorism)
- Political sensitivity, external influences, and media relations
- Area involved, jurisdictional boundaries
- Availability of resources

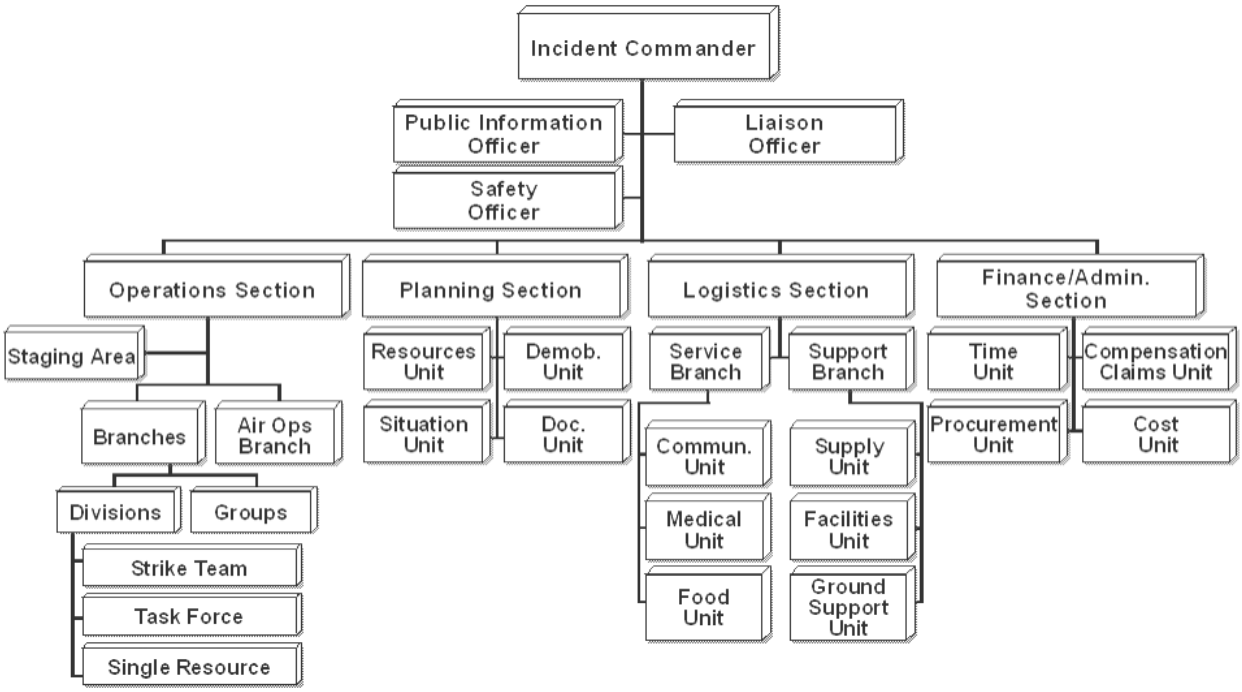
Complex Incidents are larger incidents with higher incident complexity (normally Type 1 or Type 2 incidents) that extend into multiple operational periods and rapidly expand to multijurisdictional and/or multidisciplinary efforts necessitating outside resources and support.

According to NIMS 2017, *Incident Complex* refers to two or more individual incidents located in the same general area and assigned to a single Incident Commander or Unified Command.

Position Titles

Organizational Element	Leadership Position Title	Support Positions
Incident Command	Incident Commander	Deputy
Command Staff	Officer	Assistant
Section	Chief	Deputy, Assistant
Branch	Director	Deputy
Divisions/Groups	Supervisor	N/A
Unit	Unit Leader	Manager, Coordinator
Strike Team/Resource Team/Task Force	Leader	Single Resource Boss
Single Resource	Boss, Leader	N/A
Technical Specialist	Specialist	N/A

ICS Organizational Structure and Elements



- **Command Staff:** The staff who report directly to the Incident Commander, including the Public Information Officer, Safety Officer, Liaison Officer, and other positions as required.
- **Section:** The organizational level having responsibility for a major functional area of incident management (e.g., Operations, Planning, Logistics, Finance/Administration, and Intelligence/Investigations (if established)). The Section is organizationally situated between the Branch and the Incident Command.
- **Branch:** The organizational level having functional and/or geographical responsibility for major aspects of incident operations. A Branch is organizationally situated between the Section Chief and the Division or Group in the Operations Section, and between the Section and Units in the Logistics Section. Branches are identified by the use of Roman numerals or by functional area.
- **Division:** The organizational level having responsibility for operations within a defined geographic area. The Division level is organizationally between the Strike Team and the Branch.
- **Group:** An organizational subdivision established to divide the incident management structure into functional areas of operation. Groups are located between Branches (when activated) and resources (personnel, equipment, teams, supplies, and facilities) in the Operations Section.

- **Unit:** The organizational element with functional responsibility for a specific incident planning, logistics, or finance/administration activity.
- **Task Force:** Any combination of resources assembled to support a specific mission or operational need. A Task Force will contain resources of *different kinds and types*, All resource elements within a Task Force must have common communications and a designated leader.
- **Strike Team/ Resource Team:** A set number of resources of the *same kind and type* that have an established minimum number of personnel, common communications, and a designated leader. In the law enforcement community, Strike Teams are sometimes referred to as Resource Teams.
- **Single Resource:** An individual, a piece of equipment and its personnel complement, or a crew/team of individuals with an identified work supervisor that can be used on an incident.

Overall Organizational Functions

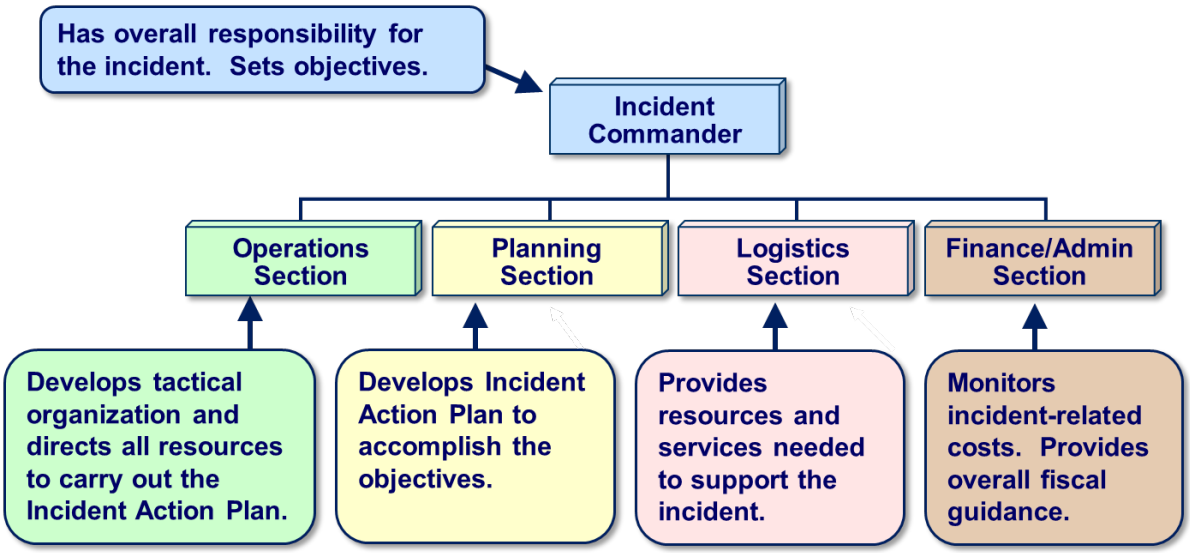
ICS was designed by identifying the primary activities or functions necessary to effectively respond to incidents. Analyses of incident reports and review of military organizations were all used in ICS development. These analyses identified the primary needs of incidents.

As incidents became more complex, difficult, and expensive, the need for an organizational manager became more evident. Thus, in ICS, and especially in larger incidents, the Incident Commander manages the organization and not the incident.

In addition to the Command function, other desired functions and activities were to:

- Delegate authority and provide a separate organizational level within the ICS structure with sole responsibility for the tactical direction and control of resources.
- Provide logistical support to the incident organization.
- Provide planning services for both current and future activities.
- Provide cost assessment, time recording, and procurement control necessary to support the incident and the managing of claims.
- Promptly and effectively interact with the media, and provide informational services for the incident, involved agencies, and the public.
- Provide a safe operating environment within all parts of the incident organization.
- Ensure that assisting and cooperating agencies' needs are met, and to see that they are used in an effective manner.

ICS – Who Does What?



Incident Commander

The Incident Commander is technically not a part of either the General or Command Staff. The Incident Commander is responsible for:

- Having clear authority and knowing agency policy.
- Ensuring incident safety.
- Establishing an Incident Command Post.
- Setting priorities, and determining incident objectives and strategies to be followed.
- Establishing the ICS organization needed to manage the incident.
- Approving the Incident Action Plan.
- Coordinating Command and General Staff activities.
- Approving resource requests and use of volunteers and auxiliary personnel.
- Ensuring after-action reports are completed.
- Authorizing information release to the media.
- Ordering demobilization as needed.

Incident Management Team

An Incident Management Team (IMT) is a rostered group of ICS-qualified personnel consisting of an Incident Commander, Command and General Staff, and personnel assigned to other key ICS positions. The level of training and experience of the IMT members, coupled with the identified formal response requirements and responsibilities of the IMT, are factors in determining “type,” or level, of IMT.

Command Staff

The Command Staff is assigned to carry out staff functions needed to support the Incident Commander. These functions include interagency liaison, incident safety, and public information.

Command Staff positions are established to assign responsibility for key activities not specifically identified in the General Staff functional elements. These positions may include the Public Information Officer (PIO), Safety Officer (SO), and Liaison Officer (LNO), in addition to various others, as required and assigned by the Incident Commander.

General Staff

The General Staff represents and is responsible for the functional aspects of the Incident Command structure. The General Staff typically consists of the Operations, Planning, Logistics, and Finance/Administration Sections. In some incidents the General Staff may also include the Intelligence/Investigations Function, either operating under a staff section, or as a stand alone section.

General guidelines related to General Staff positions include the following:

- Only one person will be designated to lead each General Staff position.
- General Staff positions may be filled by qualified persons from any agency or jurisdiction.
- Members of the General Staff report directly to the Incident Commander. If a General Staff position is not activated, the Incident Commander will have responsibility for that functional activity.
- Deputy positions may be established for each of the General Staff positions. Deputies are individuals fully qualified to fill the primary position. Deputies can be designated from other jurisdictions or agencies, as appropriate. This is a good way to bring about greater interagency coordination.
- General Staff members may exchange information with any person within the organization. Direction takes place through the chain of command. This is an important concept in ICS.
- General Staff positions should not be combined. For example, to establish a "Planning and Logistics Section," it is better to initially create the two separate

functions, and if necessary for a short time place one person in charge of both. That way, the transfer of responsibility can be made easier.

Public Information Officer Responsibilities

- Determine, according to direction from the IC, any limits on information release.
- Develop accurate, accessible, and timely information for use in press/media briefings.
- Obtain IC's approval of news releases.
- Conduct periodic media briefings.
- Arrange for tours and other interviews or briefings that may be required.
- Monitor and forward media information that may be useful to incident planning.
- Maintain current information, summaries, and/or displays on the incident.
- Make information about the incident available to incident personnel.
- Participate in planning meetings.

Safety Officer Responsibilities

- Identify and mitigate hazardous situations.
- Ensure safety messages and briefings are made.
- Exercise emergency authority to stop and prevent unsafe acts.
- Review the Incident Action Plan for safety implications.
- Assign assistants qualified to evaluate special hazards.
- Initiate preliminary investigation of accidents within the incident area.
- Review and approve the Medical Plan.
- Participate in planning meetings.

Liaison Officer Responsibilities

- Act as a point of contact for agency representatives.
- Maintain a list of assisting and cooperating agencies and agency representatives.
- Assist in setting up and coordinating interagency contacts.
- Monitor incident operations to identify current or potential interorganizational problems.
- Participate in planning meetings, providing current resource status, including limitations and capabilities of agency resources.

- Provide agency-specific demobilization information and requirements.

Assistants

- In the context of large or complex incidents, Command Staff members may need one or more assistants to help manage their workloads. Each Command Staff member is responsible for organizing his or her assistants for maximum efficiency.

Additional Command

- Staff Additional Command Staff positions may also be necessary depending on the nature and location(s) of the incident, and/or specific requirements established by the Incident Commander. For example, a Legal Counsel may be assigned directly to the Command Staff to advise the Incident Commander on legal matters, such as emergency proclamations, legality of evacuation orders, and legal rights and restrictions pertaining to media access. Similarly, a Medical Advisor may be designated and assigned directly to the Command Staff to provide advice and recommendations to the Incident Commander in the context of incidents involving medical and mental health services, mass casualty, acute care, vector control, epidemiology, and/or mass prophylaxis considerations, particularly in the response to a bioterrorism event.

Operations Section Chief Responsibilities

The Operations Section Chief is responsible for managing all tactical operations at an incident. The Incident Action Plan (IAP) provides the necessary guidance. The need to expand the Operations Section is generally dictated by the number of tactical resources involved and is influenced by span of control considerations.

Major responsibilities of the Operations Section Chief are to:

- Assure safety of tactical operations.
- Manage tactical operations.
- Develop the operations portion of the IAP.
- Supervise execution of operations portions of the IAP.
- Request additional resources to support tactical operations.
- Approve release of resources from active operational assignments.
- Make or approve expedient changes to the IAP.
- Maintain close contact with IC, subordinate Operations personnel, and other agencies involved in the incident.

Planning Section Chief Responsibilities

The Planning Section Chief is responsible for providing planning services for the incident. Under the direction of the Planning Section Chief, the Planning Section collects

situation and resources status information, evaluates it, and processes the information for use in developing action plans. Dissemination of information can be in the form of the IAP, in formal briefings, or through map and status board displays.

Major responsibilities of the Planning Section Chief are to:

- Collect and manage all incident-relevant operational data.
- Supervise preparation of the IAP.
- Provide input to the IC and Operations in preparing the IAP.
- Incorporate Traffic, Medical, and Communications Plans and other supporting materials into the IAP.
- Conduct and facilitate planning meetings.
- Reassign personnel within the ICS organization.
- Compile and display incident status information.
- Establish information requirements and reporting schedules for units (e.g., Resources and Situation Units).
- Determine need for specialized resources.
- Assemble and disassemble Task Forces and Strike Teams (or law enforcement Resource Teams) not assigned to Operations.
- Establish specialized data collection systems as necessary (e.g., weather).
- Assemble information on alternative strategies.
- Provide periodic predictions on incident potential.
- Report significant changes in incident status.
- Oversee preparation of the Demobilization Plan.

Logistics Section Chief Responsibilities

The Logistics Section Chief provides all incident support needs with the exception of logistics support to air operations. The Logistics Section is responsible for providing:

- Facilities.
- Transportation.
- Communications.
- Supplies.
- Equipment maintenance and fueling.
- Food services (for responders).
- Medical services (for responders).

- All off-incident resources.

Major responsibilities of the Logistics Section Chief are to:

- Provide all facilities, transportation, communications, supplies, equipment maintenance and fueling, food and medical services for incident personnel, and all off-incident resources.
- Manage all incident logistics.
- Provide logistical input to the IAP.
- Brief Logistics Staff as needed.
- Identify anticipated and known incident service and support requirements.
- Request additional resources as needed.
- Ensure and oversee the development of the Communications, Medical, and Traffic Plans as required.
- Oversee demobilization of the Logistics Section and associated resources.

Finance/Administration Section Chief Resposibilities

The Finance/Administration Section Chief is responsible for managing all financial aspects of an incident. Not all incidents will require a Finance/Administration Section. Only when the involved agencies have a specific need for finance services will the Section be activated. Major responsibilities of the Finance/Administration Section Chief are to:

- Manage all financial aspects of an incident.
- Provide financial and cost analysis information as requested.
- Ensure compensation and claims functions are being addressed relative to the incident.
- Gather pertinent information from briefings with responsible agencies.
- Develop an operating plan for the Finance/Administration Section and fill Section supply and support needs.
- Determine the need to set up and operate an incident commissary.
- Meet with assisting and cooperating agency representatives as needed.
- Maintain daily contact with agency(s) headquarters on finance matters.
- Ensure that personnel time records are completed accurately and transmitted to home agencies.
- Ensure that all obligation documents initiated at the incident are properly prepared and completed.

- Brief agency administrative personnel on all incident-related financial issues needing attention or followup.
- Provide input to the IAP.

Intelligence/Investigations Function

The collection, analysis, and sharing of incident-related information are important activities for all incidents. Typically, staff in the Planning Section are responsible for gathering and analyzing operational information and sharing situational awareness, and staff in the Operations Section are responsible for executing tactical activities.

However, some incidents involve intensive intelligence gathering and investigative activity, and for such incidents, the Incident Commander or Unified Command may opt to reconfigure intelligence and investigations responsibilities to meet the needs of the incident. This may occur when the incident involves a criminal or terrorist act and/or other non-law-enforcement intelligence/investigations efforts such as epidemiological investigations.

The purpose of the Intelligence/Investigations function is to ensure that intelligence and investigative operations and activities are properly managed and coordinated to:

- Prevent and/or deter potential unlawful activity, incidents, and/or attacks;
- Collect, process, analyze, secure, and disseminate information, intelligence, and situational awareness;
- Identify, document, process, collect, create a chain of custody for, safeguard, examine and analyze, and store evidence or specimens;
- Conduct thorough and comprehensive investigations that lead to the perpetrators' identification and apprehension;
- Conduct missing persons and mass fatality/death investigations;
- Inform and support life safety operations, including the safety and security of all response personnel, by helping to prevent future attacks or escalated impacts;
- Determine the source or cause of an ongoing incident (e.g., disease outbreak, fire, complex coordinated attack, or cyber incident) to control its impact and/or help prevent the occurrence of similar incidents.

The Incident Commander or Unified Command makes the final determination regarding the scope and placement of the Intelligence/Investigations function within the command structure. The intelligence/investigations function can be incorporated as an element of the Planning Section, in the Operations Section, within the Command Staff, as a separate General Staff section, or in some combination of these locations.