**Excretory Need - Kim Baily RN, PhD**

**Normal bladder function**
- Bladder stores urine
  - Relaxation of detrusor muscle and closure of sphincters
  - Controlled by PNS at S2, S3, S4 level of the spinal cord
- Micturition
  - Internal sphincter controlled by SNS
  - External sphincter: voluntary
- Routine Urinalysis (UA)
  - Color:
    - Normal: pale yellow to deep amber
    - Colorless/straw-colored
    - Dark yellow/amber
    - Bright yellow
    - Cloudy white
    - Yellow to amber with pink sediment
    - Yellow to amber with white sediment
    - Deep orange to orange-red
    - Orange-red to red
    - Green-blue to black
  - Hematuria
    - Color dependent upon pH of urine & amount of blood
    - Acid: dark, smokey; usually upper tract
    - Alkaline: red; usually lower tract
    - Causes:
      - if painless: possible neoplasm in UT
      - if renal colic: calculi, clot, bladder infection
      - if spotting: urethra or bladder neoplasm
      - if systemic: blood dyscrasias, anticoagulant therapy, neoplasms, trauma, vigorous exercise
  - Clarity of urine
    - Turbid/cloudy (flaky, granular particles suspended) may be caused by precipitation of phosphate
    - salts in alkaline urine or from bacterial growth, UT disease, or urinary or vaginal discharge
  - Specific gravity
    - Wt. of substance vs. wt. of H2O: 1.010-1.025
    - Indicates the person's ability to concentrate and dilute urine
  - pH: 4.6 – 8.0
    - Alkaline urine: metabolic alkalosis, UTIs, low-protein diets high in vegetables & citrus fruits,
    - Alkalining Rx's (NaHCO3, Diamox)
    - Acid urine: metabolic acidosis, metabolic acidosis in K+ deficiency, a high protein diet, acid-ash
    - foods (cranberries, plums, fruits), uncontrolled DM, Rx's (Vitamin
  - Protein: none or up to 8mg/100mL
    - Results from abnormal glomerular permeability, ↓ tubular reabsorption, overflow of protein in plasma
    - Occurs with toxemia; systemic diseases with varying degrees of anoxia (CHF, diabetic glomerulosclerosis, SLE, HTN, hepatitis, stress); urethritis, prostatitis, cystitis
    - False positive: high protein diet, strenuous exercise, dehydration, fever, emotional stress
- Glucose/glucosuria: None
  - Possibly caused by IV dextrose therapy, heavy meals, stress, TPN (need insulin)
    - RxS can give false positive or negative results
    - DM
- Ketones - negative
- Cells
  - RBCs: Up to 2 RBC per high power field
  - WBCs: < 4 cells /HPF
  - Urinary tract epithelium
  - Casts: formed cells/elements
  - Crystals small amount
- Bacteria or fungi None or <1000/mL
  - >100,000 indicate infection
- Parasites - None
- Pyuria: large number of pus cells make turbid & foul-smelling; usually caused by UTI
- Urine Specimen
  - Clean voided or midstream for culture or sensitivity
  - See Potter page 1335-1339
- Urine Analysis
  - Urine Culture – takes 24 to 48 hours for results
  - 24 hour collection
- Urinary Retention
  - Unable to void after 6 to 8 hours when fluid intake WNL
  - Causes
    - Surgery
    - Medication – general anesthetics
  - Residual Urine
    - Residual of urine in bladder following voiding
  - Interventions
    - Catherization
      - Allow 700 to 1000 mL to drain and then rest 15 mins
      - Then drain 200 to 300 mL every 15 mins
    - Medication
      - Urecholine/Bethanehol to initiate voiding
        - Promotes bladder contraction
        - AR: Facial flushing, sweating, GI cramps, salivation, hypotension, bradycardia
- Urinary Incontinence
  - Page 1349 Potter
  - Incidence:
    - Transient causes of UI
      - Delirium – confused state
      - Infection
      - Urethritis
      - Drugs - sedatives, diuretics, anticholinergic drugs, opiates, antidiarrheal agents, alpha-adenoreceptor agonists and antagonists
      - Psychological causes especially depression
      - Hypercalcemia, hyperglycemia
      - Restricted mobility
      - Stool impaction
- Urinary Incontinence
  - Stress
    - Loss of small amounts of urine when intra-abdominal pressure rises
    - E.g. Dribbling associated with sneezing, coughing, lifting, laughing or risining
- Cause: Loss of perineal or sphincter muscle tone 2 to child birth, menopausal atrophy, prolapsed uterus or obesity
-Nrsg: Pelvic floor strengthening (Kegal exercises), weight loss

- Urge
  - The need to void is perceived frequently, with short-lived ability to sustain control of the flow
  - E.g. Voiding commences when there is a delay in accessing a restroom
  - Cause: Bladder irrigation secondary to infection, loss of bladder tone due to recent continuous drainage with an indwelling catheter
  - NI:

- Reflex
  - Spontaneous loss of urine when the bladder is stretched with urine, but without prior perception of a need to void
  - E.g. Automatic release of urine that cannot be controlled by the person
  - Cause: Damage to motor and sensory tracts to the lower spinal cord secondary to trauma, tumor or other neurologic conditions
  - NI:

- Functional
  - Control over urination is lost because of inaccessibility of a toilet or a compromised ability to use one
  - E.g. doorways, transferring to w/c, manipulating clothing, requiring assistance
  - Cause: Impaired mobility, impaired cognition, physical restraints, inability to communicate
  - NI:

- Total
  - Loss of urine without any identifiable pattern or warning
  - E.g. a person passes urine without any ability or effort to control
  - Cause: Altered consciousness 2 to a head injury, loss of sphincter tone 2 to prostatectomy, anatomic leak through a urethral/vaginal fistual
  - NI:

- Overflow
  - Urine leaks because bladder is not completely emptied and remains distended with retained urine
  - E.g. person voids small amount frequently or urine leaks around a catheter
  - Cause: Overstretched bladder or weakened muscle tone 2 to obstruction of the urethra by debris within a catheter, an enlarged prostate, distended bowel, or postoperative bladder spasm
  - NI:

**Bowel Elimination**
- Review normal physiology of the gastrointestinal tract as it relates to excretion.
  - Absorption
  - Secretion
  - Elimination
    - Intestinal content stimulates peristalsis, moves content
    - 3 to 4 times a day, stores
    - Strongest activity after meal time
    - Ingestion to defecation 24 to 36 hours
  - Defecation
    - Reflex - smooth and skeletal muscle
    - Feces into rectum stimulates mass peristalsis --> BM
    - Voluntary control by skeletal muscle
    - Valsalva maneuver
    - Voluntary contraction of the abdominal muscles
    - Maintain forced expiration against closed airway
- Caution: Clients with CV disease, glaucoma, ↑ ICP, or new surgical wound should avoid straining with stool
  - Normal stool is painless resulting in passage of soft, formed stool.

- **Stool Specimens**
  - Guaiac stool
    - Box 45-3 Page 1388
  - Ova and parasites
  - Stool culture and sensitivity
  - Clostridium difficile toxin
  - Stool for Cryptosporidium
    - Coccidian obligate parasite
    - Found in intestinal mucosa and respiratory tracts of many animals including deer, horses and geese
    - → Diarrhea in humans

**Constipation**

- Abnormally infrequent and difficult passage of feces through lower GI. Symptom not a disease.
  - Causes:
    - Nursing interventions Nursing measures/interventions
    - Exercise
    - Fluids 1.5L/day
    - Medications
    - Fiber

- Indications for Use of laxatives
  - Removal of parasites
  - Inactive colon
  - Reduction of ammonia absorption in hepatic encephalopathic conditions
  - Drug induced constipation
  - Pregnancy/post op
  - Poor physical activity
  - Removal of toxic substances from the body
  - Poor diet
  - Megacolon
  - Preparation for colonic diagnostic procedures or surgery
  - Facilitation of BM in anorectal disorders

- **Laxatives**
  - Bulk-forming – E.g. Psyllium (Metamucil)
  - Emollient Laxatives - E.g. Docusate (Colace)
  - Lubricant: E.g. Mineral Oil
  - Hyperosmotic - E.g. Lactulose Saline, Milk of Magesia
  - Rectal enemas of sodium phosphate E.g. Fleet en
  - Stimulant
  - Phenolphthalein (ExLax)
  - Bisacodyl (Dulcolax)
  - Long term use of laxative can lead to dependency - potential for abuse
    - Discontinue: abdominal distention, pain or worsening of symptoms

- **Fecal Impaction**
  - Need MD order
  - See page 45-9 Page 1398
  - Disposable gloves and lubricant
  - Pad bed well
  - Advance finger towards umbilicus
  - Loosen fecal material
Diarrhea
- Diarrheal diseases 5-8 million deaths per year in infants and small children
- Diarrheal - increase in freq. or fluid content of bowel movements.
- A symptom not a disease

• Diarrhea - Etiology
  - Infection - most often food contaminated with bacteria or protozoa
  - Spicy or fatty foods Enzyme deficiency Excess laxatives
  - Drug therapy - irritation or drugs e.g. antibiotics that kill GI bacteria
  - Emotional stress
  - Hyperthyroidism
  - Inflammatory bowel disease - diverticulitis, ulcerative colitis, gastroenteritis, Chrohn’s
  - Surgical bypass of intestine Cancer

• Meds – depends on mechanism of action
  - Adsorbents
    - Bismuth Subsalicylate(Pepto-Bismol) - same side effects as aspirin. Use with caution in children with chicken pox or flu (Reye’s syndrome)
    - Attapulgite (Kaopectate)
  - Anticholinergics
    - Donnatel (Belladonna alkaloids) - atropine, hyoscyamine and hyoscine
  - Intestinal flora modifiers
    - Lactobacillus acidophilus
  - Opiates
    - Diphenoxylate (Lomotil)

Flatus
• Etiology
  - Gas in upper airways mainly from swallowed air, therefore mainly nitrogen
    - Usually expelled by belching
  - Gas passed via the rectum is flatulence
    - Antiflatulents
  - Often added to antacids

• Activated charcoal
  - Simethicone
  - Either given with antacids or alone

Ostomy care
• Ostomy – surgically created opening to bowel or other structure
• Ileostomy – opening to ileum
• Colostomy – opening to colon
• Stoma – entrance to opening
• Appliance - most patients with ostomies wear a pouch to collect stool
• Ostomy may also be used to administer irrigation
• Prevention of skin breakdown
  - Primary focus
  - Enzymes in stool can cause excoriation (chemical injury to skin)
    - Wash stoma and surrounding skin with mild soap and water and pat dry
  - Skin barriers may be used – applied around stoma
• Applying an ostomy appliance
  - Consists of:
    - Face plate which attaches to abdomen
    - Pouch for collection
    - Stoma protrudes through an opening in the center of the appliance
    - The pouch fastens in position, pressed over the circular support on the faceplate
  - Pouch is emptied by releasing the clamp at the bottom
- Empty pouch when 1/3 to ½ full or it may become heavy and pull at faceplate
- Continent ostomy - Aka: Koch’s pouch
  - No appliance necessary
  - Drained every 4 to 6 hours (max)
  - Pt in sitting position
  - Lubricate 22 to 28F catheter into stoma
  - Insert approximately 2 inches through valve (which prevents leakage of fluid)
  - Gently advance through valve at the end of exhalation, while coughing, or while bearing down as if to pass stool
  - Lower end of catheter at least 12 inches below the stoma
  - Direct end into collection container
- The End!