Assessment of the Neurologic System

Structure and Function

Subjective Data—Health History Questions

Objective Data—The Physical Exam
  - Performed in lab

Structure and Function

Nervous System
  - Central Nervous System (CNS)
    - Brain
      - Spinal cord
  - Peripheral Nervous System
    - 12 pairs of cranial nerves
    - 31 pairs of spinal nerves and all branches

Structure and Function

Central Nervous System (CNS)
  - Cerebral cortex
    - Frontal lobe
    - Parietal lobe
    - Occipital lobe
    - Temporal lobe
  - Basal ganglia
  - Thalamus

- Hypothalamus
- Cerebellum
- Brainstem
  - Midbrain
  - Pons
  - Medulla
- Spinal cord
- Sensory and motor pathways

Structure and Function, cont.

Peripheral Nervous System
  - Cranial nerves
  - Spinal nerves
  - Reflexes

Subjective Data—Health History Questions

- Headache
- Head injury
- Dizziness/vertigo
- Seizures
- Tremors
- Weakness

- Incoordination
- Numbness or tingling
- Difficulty swallowing
- Difficulty speaking
- Significant past history
- Environmental/occupational hazards
Objective Data—
The Physical Exam

- Preparation
  - Screening neurologic examination
  - Complete neurologic examination
  - Neurologic recheck
  - Glasgow coma scale (GCS)

- Equipment needed
  - Penlight
  - Tongue blade
  - Cotton swab
  - Cotton ball
  - Tuning fork (128 Hz or 256 Hz)
  - Percussion hammer
  - Occasionally need: familiar aromatic substance

Age Related Changes
Normal findings

- Senile tremors
- Gait
- Rapid alternating movements

- Reflexes
  - DTRs less brisk
  - Ankle and knee jerk lost
  - Upper extremities usually present

- Loss of sensation of vibration
  - Ankle malleolus

- Position sense
- Decrease in cerebral blood flow

Objective Data—
The Physical Exam, cont.
(discussed in lab)

Test Cranial Nerves

- I—Olfactory
- II—Optic
- III—Oculomotor, IV—Trochlear, VI—Abducens
- V—Trigeminal
  - Motor function
  - Sensory function
  - Corneal reflex

- VII—Facial
  - Motor function
  - Sensory function

- VIII—Acoustic (vestibulocochlear)
- IX—Glossopharyngeal, X—Vagus
  - Motor function
  - Sensory function

- XI—Spinal accessory
- XII—Hypoglossal

Objective Data—
The Physical Exam, cont.
(discussed in lab)

- Cerebellar function
  - Balance tests
    - Gait
    - Romberg test
    - Tandem walk
    - Shallow knee bend
  - Coordination and skilled movements
    - Rapid alternating movements (RAM)
• Finger-to-finger test
• Finger-to-nose test
• Heel-to-shin test

11 Objective Data—
The Physical Exam, cont.
(discussed in lab)

Sensory System
• Person is alert, cooperative, and comfortable
• Guidelines for sensory testing
• Spinothalamic tract
  – Pain
  – Temperature
  – Light touch

• Posterior column tract
  – Vibration
  – Position (kinesthesia)
  – Tactile discrimination (fine touch)
    • Stereognosis
    • graphesthesia
    • Two-point discrimination

12 Objective Data—
The Physical Exam, cont.
(discussed in lab)

• Test the deep tendon reflexes (DTRs)
  – Technique
  – Grading
  – Biceps reflex
  – Triceps reflex
  – Brachioradialis reflex
  – Quadriceps reflex
  – Achilles reflex ("ankle jerk")
  • Clonus