OBJECTIVES
- Review A & P of neurological system
- Differentiate between normal and abnormal findings including age related changes
- Identify diagnostic exams including interventions
- Discuss etiology, pathophysiology, manifestations and collaborative management of:
  - Clients with HA
  - Clients with seizure disorders
  - Clients with lower back pain including laminectomies

ANATOMY
- Brain
- Spinal cord
- Peripheral nervous system
- Autonomic nervous system
- Sympathetic
- Parasympathetic

ASSESSMENT OF NEURO FUNCTION
- Health history
- Assessment
  - LOC
  - PERRLA
  - Language/speech
  - Motor function
  - Reflexes
- Changes associated with aging
  - Motor/sensory ability
  - Mental status changes

ASSESSMENT OF REFLEX ACTIVITY

BABINSKI’S SIGN
**DIAGNOSTIC TESTS**

- X-ray
- CT scan
- MRI/MRA
- PET scan
- Cerebral angiogram
- Carotid ultrasound
- EEG
- EMG
- LP

**HEADACHE**

- Most frequent health problem
- Migraine
  - Common
  - Classic
- Cluster HA
- Tension HA

**HEADACHE INTERDISCIPLINARY CARE**

- Diagnosis
- Medications
- Alternative therapy
- Teaching
- Nursing Dx

**SEIZURES**

- Chronic disorder
- Affects 2.5 million people in US
- New onset seizures > 180,000/year
- Increasing incidence
  - Technological advancement
- Isolated seizures
  - Febrile
  - Infection
  - Metabolic
  - Toxins
  - Alcohol withdrawal
  - Electrolyte imbalance

**SEIZURE - PATHO**

- Rhythmic and repetitive hyper-synchronous electrical activity of the brain
- Causes
  - Several theories
- Seizure threshold
- Un-provoked seizure - no cause identifiable
- Provoked seizure
  - Fever,
  - Metabolic or endocrine
  - Meningitis
  - Withdrawal
  - Cerebral edema/bleeding

**PARTIAL SEIZURES**

- Simple partial seizure
  - Motor involvement
  - Sensory involvement
  - Autonomic nervous system disruption
  - Psychic manifestation
- Complex partial seizure
  - Repetitive non-purposeful activities
  - No consciousness
  - Amnesia
  - Aura
**Generalized Seizures**

- Absence seizure
  - Cessation of motor activity
  - 5-10 seconds each
  - Up to several hundred/day
- Tonic clonic seizure
  - Tonic phase
    - No breathing
    - Muscles stiff, extended
  - Clonic phase
    - Contraction and relaxation of muscles
    - Hyperventilation
  - Postictal period
    - Unconsciousness

**Status Epilepticus**

- Usually tonic clonic
- Very short rests between seizures
- Life threatening medical emergency
  - Respiration not adequate
  - Increased metabolic need

**Seizure - Diagnosis**

- MRI
- CT
- EEG
- LP
  - If infection or tumor suspected
- Blood work
  - CBC
  - BMP
  - Blood glucose

**Seizure Medications**

- To stop seizures in progress:
  - Diazepam (Valium)
  - Lorazepam (Ativan)
- Most common to maintain seizure free:
  - Phenytin (Dilantin)
  - Valporic acid (Depakote)
  - Phenobarbital
  - Carbamazepine (Tegretol)
  - Gabapentin (Neurontin)
  - Clonazepam (Klonopin)
- Surgery

**Nursing Care**

- Health promotion
  - Stay on medication even if no seizures
  - No driving
  - Teach family first aid in seizures
- Assessment
  - Health history
  - Physical assessment
- Nursing Dx
  - Risk for ineffective airway clearance
  - Risk for injury
  - Anxiety
  - Risk for fall

**Low back pain**

- Strains of muscle and tendons
- 5 causes
  - Local pain
  - Referred pain
  - Pain of spinal origin
  - Radicular back pain
  - Muscle spasm pain
Factors associated with back pain
- Mechanical injury or trauma
- Degenerative disorders
- Systemic disorders
- Referred pain
- Others

Manifestation of lower back pain
- Alteration in gait
  - Stiff walk
  - No bending
  - Limp
- Neurological involvement
  - Sensation varies between extremities
  - Pain
  - Stabbing pain
  - Radiating pain
  - Assessment tests

Interdisciplinary care
- Diagnosis
  - History
  - Assessment
  - Tests
- Medications
  - NSAIDs
  - Muscle relaxants
  - Steroids
- Conservative treatments
  - Exercise
  - Heat
  - Education
- Health promotion
  - Exercise
  - Quit smoking
  - Loose weight
  - Correct posture
  - Seat support
  - Correct lifting
  - Nursing Dx
  - Acute pain
  - Knowledge deficit

Herniated intervertebral disk
- Path
  - Ruptured disk - cartilage surrounding disk ruptures
  - Slipped disk - herniated nucleus pulposus
  - Excrutiating pain
  - Limited mobility
- Incidence
  - More common in men
  - Most often L4-L5 or L5-S1

Manifestations Ruptured Disk
- L4-L5
  - Pain
  - Muscle spasms
  - Paresthesia
- L5-S1
  - Pain
  - Paresthesia
  - C5-C6
  - Pain
  - Decreased reflexes

Interdisciplinary Care Ruptured Disk
- Diagnosis
  - X-ray or CT scan
  - EMG
  - Myelogram
- Medications
  - NSAIDs
  - Muscle relaxant
- Conservative treatment
  - Normal activity
  - Meds
  - Teaching
**Interdisciplinary Care Ruptured Disk**
- **Surgery**
- Laminectomy - removal of part of vertebral lamina
- Spinal fusion - wedge shaped bone inserted between vertebrae
- Microdiskectomy - less trauma to surrounding tissues

**Nursing Care Laminectomy**
- **Pre-op teaching**
  - Log-roll
  - TCDB
  - Meds
- **Post-op care**
  - Minimize stress to spine
  - Assessment
  - Encourage breathing exercise
  - Increase mobility

**Health Promotion Laminectomy**
- **Proper body mechanics**
  - Broaden base when standing
  - Use arm and leg muscles when lifting
  - Bend knees
  - Get close to object to be lifted
  - Back support belt

**Nursing Diagnosis Herniated Disk**
- Acute pain
- Chronic pain
- Risk for injury
- Constipation