NURS 6501 Final Exam Review Guide (Weeks 7-11)

• Structure and Function of the Cardiovascular and Lymphatic Systems
• Pathophysiological changes related to Pain, Temperature Regulation, Sleep, and Sensory Function
• How does patient characteristics such as racial and ethnic variables impact altered physiology?
• How does the pathophysiology of spinal injuries impact patients?
• What is the impact of patient characteristics on disorders and altered physiology.

Common Neurological and MS disorders and the pathophysiological nature of these issues in adults and children:

Concepts of Neurological and Musculoskeletal Disorders

Stroke

- Cerebrovascular disease is the most frequently occurring neurologic disorder. Any abnormality of the blood vessels of the brain is referred to as cerebrovascular disease includes vessel wall abnormalities and vascular malformations, thrombotic or embolic occlusion, and increased blood viscosity or clotting.
- Cerebrovascular disease causes
    - ischemia with or without infarction and hemorrhage.
    - The common clinical manifestation is a cerebrovascular accident (CVA) or stroke syndrome.
    - Hypertension is the greatest risk factor followed by other preventable risks.
- **CVAs** are classified according to the pathophysiology and include ischemic (thrombotic, embolic, and hypoperfusion), lacunar (small vessel disease), and hemorrhagic strokes.
- **Ischemic strokes** result from interruption in brain-blood flow with a core of irreversible ischemia and necrosis or infarction that appears pale (white infarct).
    - The zone around the infarction has reversible ischemia, is called the ischemic penumbra, and can regain neurologic function, particularly with thrombolytic treatment.
    - Leaking blood vessels can develop in the infarcted area, resulting in a hemorrhagic transformation (a red infarct) that can be exacerbated by thrombolytic therapy.
    - Reperfusion injury can occur with ischemic stroke.
- **Intracerebral hemorrhagic stroke** is primarily associated with vessel disease related to hypertension.
- **Subarachnoid hemorrhage** is associated with ruptured aneurysms, arteriovenous malformations (AVMs), or cavernous angioma.

- Subarachnoid hemorrhage is bleeding into the subarachnoid space commonly associated with intracranial aneurysms, AVM, and hypertension. The expanding hematoma increases ICP, compresses brain tissue, reduces cerebral perfusion, disrupts the bloodbrain barrier, and causes inflammation and neuronal death. Secondary brain injury follows. Seizures and hydrocephalus can accompany neurologic deficits.

Multiple sclerosis

- MS is a chronic inflammatory disease involving degeneration of CNS myelin in genetically susceptible individuals.
- The cause is unknown and autoreactive T and B cells recognize myelin autoantigens and produce myelin-specific antibodies triggering inflammatory demyelination with loss of oligodendrocytes and plaque formation leading to disruption of nerve conduction.
- The clinical manifestations of MS involve different types: relapsing-remitting, primary progressive, secondary progressive, and progressive-relapsing.

Transient Ischemic Attack

- A transient ischemic attack is a transient episode of neurologic dysfunction resulting from focal cerebral ischemia with risk for progressing to stroke.

Myasthenia gravis

- Myasthenia gravis results from a defect in nerve impulse transmission at the neuromuscular junction with generalized, ocular, or neonatal subtypes. Autoantibodies, complement deposits, and membrane attack complex destroy the acetylcholine receptor (AChR) sites, causing decreased transmission of nerve impulses, leading to muscle weakness, including ocular and systemic muscles. There can be childhood and adult onset.

Headache

- **Migraine** is an episodic disorder whose marker is headache lasting 4 to 72 hours.
  - Migraine is classified as a headache with and without aura and chronic migraine (migraines 15 days in a month for more than 3 months).
  - **Migraine** may be precipitated by a triggering event.
  - The aura is associated with cortical spreading depression, which initiates the release of neurotransmitters, particularly CGRP, that stimulate vasodilation in the trigeminal vascular system, inflammation, and sensitization of pain receptors. Glutamate is increased and serotonin is decreased.
- **Cluster headaches (trigeminal autonomic cephalalgia)** occur in episodes several times during a day for a period of days at different times of the year, primarily in men.