N441 Exam 3 Concept Review

Week 7:

1. Neurovascular assessment (what to assess and priority)
    a. Performed every hour for the first 24 hr and every 1 to 4 hr thereafter
    b. Pain: Assess pain level, location, and frequency. Assess pain using a 0 to 10 pain rating scale, and have the client describe the pain. Immobilization, ice, and elevation of the extremity with the use of analgesics should relieve most of the pain.
    c. Sensation: Assess for numbness or tingling of the extremity. Loss of sensation can indicate nerve damage.
    d. Skin temperature: Check the temperature of the affected extremity. The extremity should be warm, not cool to touch. Cool skin can indicate decreased arterial perfusion.
    e. Capillary refill: Press nail beds of affected extremity until blanching occurs. Blood return should be within 3 seconds. Prolonged refill indicates decreased arterial perfusion. Nail beds that are cyanotic can indicate venous congestion.
    f. Pulses: Pulses should be palpable and strong. Pulses should be equal to the unaffected extremity. Edem can make it difficult to palpate pulses, so Doppler ultrasonography might be required.
    g. Movement: Client should be able to move affected extremity in active motion.

2. Embolism (patho, who is at risk, S/S and nursing intervention priority)
    a. Patho: Fat globules from the bone marrow are released into the vasculature and travel to the small blood vessels, including those in the lungs, resulting in acute resp. insufficiency and impaired organ perfusion.
    b. At risk: Fat embolism can occur after the injury, usually within 12 - 48 hr following long bone fractures or total joint arthroplasty (Hip and pelvis fractures are common causes).
    c. S/S
        i. early: dyspnea, increased RR, decreased O2sat, HA, decreased mental acuity r/t low arterial O2 level, resp. distress, tachycardia, confusion, chest pain
        ii. late: cutaneous petechiae; pinpoint-sized subdermal hemorrhages that occur on the neck, chest, upper arms, and abdomen (from the blockage of the capillaries by the fat globules)
    d. RN interventions

i. Maintain the client on bed rest
ii. Prevention includes immobilization of fractures of the long bones and minimal manipulation during turning if immobilization procedure has not yet been performed.
iii. Treatment includes O2 for resp. compromise, corticosteroids for cerebral edema, vasopressors, and fluid replacement for shock, as well as pain and antianxiety meds as needed.

e. DVT and PE
    i. RN interventions: encourage early ambulation, apply anti-embolism stocking & SCD, admin anticoagulants as prescribed, encourage intake of fluids to prevent hemoconcentration, instruct the client to rotate feet at the ankles and perform other lower extremity exercises as permitted by the particular immobilization device, Mx for S/Sx (swollen, reddened calf).

3. Traction types (skeletal and skin, primary purpose of each, nursing assessment of patient and weights)
    a. Skeletal: reduces fractures (screws are inserted into the bone)
    b. Skin: decreases muscle spasms and immobilizes the extremity prior to surgery
    c. Assessments:
        i. Assess neurovascular status of the affected body part every hour for 24 hr and every 4 hr after that
        ii. Maintain body alignment and realign if the client seems uncomfortable or reports pain
        iii. Avoid lifting or removing weights
        iv. Ensure that weights hang freely and are not resting on the floor
        v. Make sure the weights are balanced/equal
        vi. If the weights are accidentally displaced, replace the weights. If the problem is not corrected, notify the provider
        vii. Ensure that pulley ropes are free of knots, fraying, loosening, and improper positioning at least every 8 to 12 hr (2-3x/day)
        viii. Notify the provider if the client experiences severe pain from muscle spasms unrelieved with medications or repositioning

ix. Move the client in halo traction as a unit, without applying pressure to the rods. This will prevent loosening of the pins and pain
x. Routinely monitor skin integrity and document
xi. Use heat/massage as prescribed to treat muscle spa

4. Pressure point prevention (for pts in traction)
    a.
5. Promoting functional healing
    a. Assess neurovascular status of the affected body part every hour for 24 hrs and every 4 hr after that
    b. Maintain body alignment and realign if the client seems uncomfortable or reports pain
    c. Avoid lifting or removing weights
    d. Ensure that weights hang freely and are not resting on the floor
    e. If the weights are accidentally displaced, replace the weights; if the problem is not corrected, notify the provider
    f. Ensure that pulley ropes are free of knots, fraying, loosening, and improper positioning at least every 8 to 12 hrs
    g. Notify the provider if the client experiences severe pain from muscle spasms unrelieved with medications or repositioning; move the client in halo traction as a unit without applying pressure to the rods; this will prevent loosening of pins and pain
    h. Routinely monitor skin integrity and document
    i. Use heat/massage as prescribed to treat muscle spasms
    j. Use therapeutic touch and relaxation techniques
6. Prioritization: Neuro checks
7. Amputations (Prep for prosthesis, contractures and interventions)
    a. Prosthesis:
        i. Wrap the residual limb, using elastic bandages **(figure-eight wrap)** to prevent restriction of blood flow and decrease edema
        ii. Use a residual limb shrinker sock (easier for the client to apply)
        iii. Use an air splint (plastic inflatable device) inflated to protect and shape the residual limb and for easy access to inspect the wound
    b. Prevent contractures
        i. Above the knee: To prevent knee or hip flexion contractures, may elevate extremity for 24-48hrs (1-2 days) to reduce swelling/discomfort, then no more

elevation: flattened. Have client lay prone 20-30 min several times a day to help prevent hip flexion contractures
   ii. Below the knee: straighten out the knee
   iii. Have the client lie prone for 20 to 30-min several times a day to help prevent hip flexion contractures
   iv. Discourage prolonged sitting to prevent flexion

8. Compartment Syndrome (S/S)
   a. Five P's (pain, paralysis, paresthesia, pallor, and pulselessness)
      i. Increased pain unrelieved with elevation or by pain medication. Intense pain when passively moved.
      ii. Paresthesia or numbness, burning, and tingling are early manifestations
      iii. Paralysis, motor weakness, or inability to move the extremity indicate major nerve damage and are late manifestations
      iv. Pallor of the affected tissue, and nail beds are cyanotic
      v. Pulselessness is a late manifestation of compartment syndrome.
      vi. Palpated muscles are hard and swollen from edema

Week 8:

1. Hemorrhagic Stroke (S/S, how it differs from Embolic Stroke)

- Hemorrhagic occur secondary to a ruptured artery or aneurysm. The prognosis for a client who has experienced a hemorrhagic stroke is poor due to the amount of ischemia and increased ICP caused by the expanding collection of blood. If it is caught early and evacuation of the clot can be done with cessation of the active bleeding, the prognosis of a hemorrhagic stroke improves significantly.
  a. S/s: some clients report transient manifestations, such as visual disturbances, dizziness, slurred speech, and a weak extremity. Manifestations vary based on the areas of the brain that is deprived of oxygenated blood
     i. SUDDEN SEVERE HEADACHE, confusion, N/V, vision changes
     ii. Left hemisphere: language, math skills, analytic thinking
        - Expressive and receptive aphasia (inability to speak and understand lang.)

- Agnosia (unable to recognize familiar objects)
- Alexia (reading difficulty)
- Agraphia (writing difficulty)
- Right extremity hemiplegia (paralysis) or hemiparesis (weakness)
- Slow, cautious behavior
- Depression, anger, and quick to become frustrated
- Visual changes, such as hemianopsia (loss of visual field in one or both eyes)

iii. Right hemisphere: visual and spatial awareness and proprioception
- Altered perception of deficits (overestimation of abilities)
- Unilateral neglect syndrome (ignore left side of the body: cannot see, feel, or move affected side, so client unaware of its existence)
- Loss of depth perception
- Poor impulse control and judgement
- Left hemiplegia or hemiparesis
- Visual changes, such as hemianopsia

b. Embolic stroke results from an embolus traveling from another part of the body to the cerebral arteries. S/sx and changes are seen faster in embolic stroke than hemorrhagic
c. Hemorrhagic stroke deals with a bleed in the brain. (a hemorrhage) embolic stroke is when circulation to the brain is cut off by an embolus (foreign body) in the bloodstream.

2. Increased ICP (normal values, S/S early vs late, earliest signs
   a. Normal values: 10-15
   b. S/Sx: ***Need to double-check early vs. late***
      i. Early: severe headache, deteriorating level of consciousness, restlessness, irritability, slowness to react
         1. *Kids: nausea, headache, forceful vomiting, blurred vision, increased sleeping, inability to follow simple commands, decline in school performance, seizures
      ii. Late: alteration in breathing pattern (Cheyne-Stokes respirations, central neurologic hyperventilation, apnea), deterioration in motor function, and abnormal posturing (decerebrate, decorticate, flaccidity)
         1. *Kids: alterations in pupillary response, posturing (flexion and extension), bradycardia, decreased motor response, decreased response to painful stimuli, Cheyne-Stokes respirations, optic disc

swelling, decreased consciousness, coma

c. Earliest sign: change in LOC. Clients who are comatose or have GCS scores of 8 or lower are candidates for ICP monitoring.

3. ICP Maintenance (nursing interventions to keep ICP normal, medications)
    a. Elevate head at least 30° to reduce ICP and to promote venous drainage
    b. Avoid extreme flexion, extension, or rotation of the head, and maintain the body in a midline neutral position
    c. Maintain a patent airway. Provide mechanical ventilation as indicated
    d. Administer oxygen as indicated to maintain PaO2 greater than 60 mm Hg
    e. The client should receive stool softeners and avoid the Valsalva maneuver with increased ICP
    f. Provide a calm, restful environment. (Limit visitors. Minimize noise.)
    g. Brief periods of hyperventilation for the intubated client can be used after the first 24 hr following injury to help lower ICP. During the first 24 hr, hyperventilation can cause cerebral vasoconstriction, which can cause ischemia.
    h. Meds:
        i. Mannitol: draws fluid from the brain into the blood
        ii. Barbiturates: used to place the patient in a coma (barbiturate coma) to decrease cellular metabolic demand until ICP can be decreased
        iii. Phenytoin: prevent or treat seizures
        iv. Opioids: used to control pain and restlessness; avoid with clients who are not mechanically ventilated

4. Central Perfusion Pressure
    a. Pressure that drives oxygen to cerebral tissue
    b. Anything below 60 is bad
5. Prioritization (ABC)
6. Glascow Coma Scale (when it's used, what values mean, value changes that are concerning)
    a. Looks for a change in condition; helpful in determining changes in the level of consciousness for clients who have head injuries, space-occupying lesions or cerebral infarctions, and encephalitis.
    b. Values:
        i. Eye-opening (E): The best eye response, w/ responses ranging from 4 to 1

- 4 = Eye opening occurs spontaneously.
- 3 = Eye opening occurs secondary to sound.
- 2 = Eye opening occurs secondary to pain
- 1 = Eye opening does not occur

ii. Verbal (V): The best verbal response, with responses ranging from 5 to 1
- 5 = Conversation is coherent and oriented
- 4 = Conversation is incoherent and disoriented
- 3 = Words are spoken, but inappropriately
- 2 = Sounds are made, but no words
- 1 = Vocalization does not occur.

iii. Motor (M): The best motor response, with responses ranging from 6 to 1
- 6 = Commands are followed
- 5 = Local reaction to pain occurs
- 4 = General withdrawal from pain (grimacing)
- 3 = Decorticate posture (adduction of arms, flexion of elbows and wrists) is present
- 2 = Decerebrate posture (abduction of arms, extension of elbows and wrists) is present
- 1 = Motor response does not occur

c. Concerning value changes→ any decrease in score over time

7. Manifestations of left hemispheric stroke (personality and MSK)
   a. S/sx:
      i. right extremity hemiplegia/paralysis or hemiparesis/weakness
      ii. slow, cautious behavior
      iii. depression, anger, and quick to become frustrated
8. Manifestations of right hemispheric stroke (personality and MSK)
   a. S/sx:
      i. Left hemiplegia or hemiparesis
      ii. Unilateral neglect syndrome (ignore the left side of the body: cannot see, feel, or move affected side, so client unaware of its existence)
      iii. Poor impulse control and judgment
      iv. Altered perception of deficits (overestimation of abilities)
9. Aphasia (communication techniques)
   - Assess the ability to understand speech by asking the client to follow simple commands.
   - Observe for consistently affirmative answers when the client actually does not comprehend what is being said.
   - Assess accuracy of yes/no responses in relation to closed-ended questions.

- Supply the client with a picture board of commonly requested items/needs.
- **For expressive and receptive aphasia speak slowly and clearly, use one-step commands**.
- Assist with safe feeding.

10. Basal skull fracture (Differentiate between CSF and nasal secretions)
    - CSF leakage from the nose and ears can indicate basilar skull fracture ("halo" sign: yellow stain surrounded by blood on a paper towel; fluid tests positive for glucose).

11. Epidural hematoma (S/S, transient): blood collection between the skull and the dura
    a. Priority assessment: respiratory status; 1-hr "golden window" to treat
    b. S/s come and go (transient): ***
        i. brief loss of consciousness with return of lucid state; then as hematoma expands, increased ICP will often suddenly reduce LOC, emergency situation
12. Traumatic brain injury
    a. Maintain a quiet, calm environment/ minimal stimuli
13. Lumbar puncture
    - CSF analysis is the most definitive diagnostic procedure for meningitis. It is also consistently used with cerebral hemorrhage and ruptured aneurysm
    - May also be used to reduce CSF pressure
    - Results for meningitis are as follows:
        - Appearance of CSF: cloudy (bacterial) or clear (viral)
        - Elevated WBC
        - Elevated protein
        - Decreased glucose (bacterial)
        - Elevated CSF pressure
14. Thrombolytics (contraindications)
    a. Oral anticoagulation use
    b. Recent intracranial or spinal surgery
    c. Age: less than 18, older than 80

15. Autonomic Dysreflexia (Patho, Nursing interventions for BP)
    a. Patho: sudden onset of excessively high blood pressure triggered by injury/ sustained stimuli at T6 or below
    b. RN interventions for BP:

i. Sit the client up to decrease blood pressure
ii. Monitor vital signs for severe hypertension and bradycardia
iii. Administer antihypertensives (nitrates or hydralazine)