Week 5:

- **Volume imbalances caused by:**
    - Abnormal GI losses- N/V/D, NG tube suctioning
    - Abnormal skin loss-diaphoresis (sweating)
    - Abnormal renal losses-diuretic therapy, DI, kidney disease, adrenal insufficiency, osmotic diuresis
    - Third spacing- ascites, burns, peritonitis
    - Hemorrhage-severe bleeding
    - Altered intake-NPO, older adults-lack of thirst drive
- **Fluid volume deficit**
    - Manifestations
        - Acute Wt. loss
        - hyperthermia
        - tachycardia
        - tachypnea
        - hypotension-decreased BP, orthostatic
        - decreased skin turgor
        - dizziness,
        - flattened jugular veins
        - thirst and confusion
        - sunken eyes
        - Skin-cool, clammy, pale
        - fever
    - Diagnostic findings

        - Increased H&H
        - Decreased urine Na
        - Increased BUN (greater than 25 mg/dL), Creatine, Urine specific gravity (1.030)
    - Rn IN
        - IV fluids -monitor serum values for Na, K, Ca, Mg.
        - Monitor I&O's, daily wts.
        - Monitor for neuro changes
- **Fluid volume overload**
    - Manifestations
        - Weight gain (1L of fluid wt. 2.2 lbs)
        - SOB
        - Bounding heart rate, cough (elevated BP)
        - Ascites
        - Distended jugular veins
        - Crackles
        - Increased RR, urine output
    - Diagnostic
        - Decreased H&H, urine specific gravity
        - Decreased urine Na; serum and urine osmolarity
    - Nursing interventions
        - Sodium restrictions
        - Diuretics (Lasix (furosemide), thiazide
        - Monitor I&O's

        - Monitor Weight
        - Fluid restrictions
    - Complications
- **Normal Electrolyte Ranges**
    - Be able to identify abnormalities
        - Sodium: 135-145
        - Potassium: 3.5- 5
        - Calcium: 8.5-10
        - Magnesium: 1.3- 2.1
        - Phosphate: 2.5-4.5
        - Chloride: 98-106
- **Electrolyte imbalances**
    - General risk factors
        - Fluid loss, not enough intake (orally), not absorbing in GI tract
        - S&S: Heart dysrhythmias, seizures, LOC, muscle pain/spasms,
    - Understand which elevated or decreased values are most pertinent (this was discussed in class)
- **Sodium imbalances (hypo/hyper) (135-145) watch lithium levels if low Na**
    - Manifestations -hypo
        - Hypo- N/V/D, confusion, headache, lethargy, dizziness, muscle cramps, seizure, dry mucosa, poor skin turgor, decreased salivation, decreased BP, abdominal cramping, neuro changes
    - Causes- fluid imbalances, diuretic use, loss of GI fluids
        - Low BP and slightly elevated HR can be signs also with hypovolemia

- Rn In-Monitor wt., I&O's, LOC, vital signs, administer IV fluids (isotonic), DTR's
- Manifestations-hyper
  - Hyper-tachycardia, increased temp, restlessness, weakness, thirst, dry, swollen tongue, sticky mucosa; neuro. symptoms

- **Potassium imbalances (hypo/hyper) (3.5-5) watch digoxin levels if low K**
  - Manifestations
    - Hypo-flattened T waves, prominent U wave; N/V, fatigue, muscle weakness, cramps-Calf, dysrhythmias, paresthesia, decreased muscle strength, DTRs
    - Hyper-Elevated/peaked T waves, GI upset, palpitations, anxious
  - Nursing interventions
    - Hypo-Administer K rider w/NS 0.9%
      - Hyper-Kayexalate
    - Continuous Pulse Ox, telemetry
    - Assess IV site for infiltration/irritation
    - Food- bananas, avocados, citrus fruit, vegs., dried peas & beans, whole grains, milk
    - Monitor I&O's, DTRs, LOC, serum K levels
  - Treatment
    - Hypo-K rider, oral K, liquid form also
    - Hyper-insulin, bicarb., glucose to do a quick shift
      - Kayexalate (sodium polystyrene sulfonate)
  - Patient education
    - Diet to include foods w/high potassium-avocados, bananas, citrus fruit

- EKG changes
    - Flattened T-waves, prom. U wave with hypo
    - Elevated T-waves with hyper

- **Calcium imbalances (hypo/hyper) (8.5-10)**
    - Manifestations
        - Hypo-Numbness, tingling of hands, fingers, toes, around mouth
        - + trousseau and Chvostek signs, hyperactive DTRs, anxiety, tetany, seizures
        - Hyper-frequent urination, N/C, elevated BP
    - EKG changes
        - Hypo-prolonged QT interval
        - Hyper-shortened QT interval
    - Rn In
        - Hypo-vitamin D therapy
            - IV Calcium gluconate
            - Seizure precautions
            - Teach pt. to use weight bearing exercises
        - Hyper-diuretics
            - Calcitonin
            - Biphosphate
            - Fluids
            - Monitor for digoxin toxicity

Week 6:

- ABG

    - Components of ABG
        -
    - Interpreting results (Acid-Base imbalances)
    - EKG findings from imbalances
- Respiratory Alkalosis
    - Nursing interventions
- Septic shock-Caused by infection spreading to the entire body
    - Assessment findings
        - N/V/D
        - Hyperthermia/fever
        - Bounding pulses-tachycardia
        - Flushed skin
        - Elevated RR, Temp, HR
    - Nursing interventions
        - Hand Hygiene
        - Monitor CBC w/diff -WBC, CRP ESR, CMP-liver (AST, ALT, ALP) and kidney function (BUN, Creatine), lactic levels
        - Monitor I&O’s
        - Monitor LOC, V.S. (RR), Breathing
        - Obtain blood and urine cultures -culture and sensitivity
        - Increase calories to Pt. (over 3000)-may have to use TPN or other methods
    - qSOFA
        - RR greater than 22/min
        - GCS (Glasco Coma Scale) less than 15

        - Systolic BP less than 100
    - SIRS
        - Temp over 38.3 or less than 36 degree Celsius
        - HR greater than 90
        - RR greater than 20
- MODS-can happen with any type of shock
    - Nursing interventions
        - Monitor CMP-BUN, Creatine
        - CBC-WBC, platelet count
        - Be transparent to Patient and family about outcome
        - Assess organ function
        - Prevent it from happening in the first place
    - Priority
        - Lung function and ABCs
        - Promoting comfort to patient and letting them know what's going on and possible outcome. Tell them "we are doing everything we can"
- Cardiogenic shock
    - Causes
        - Acute MI
        - Cardiac tamponade
        - Blunt chest injury
    - Nursing interventions
        - Monitor ABG's, pulse O2, breathing-Oxygen if needed (2-6 Liters NC)

        - Fluid therapy- IV: watch for fluid overload (especially w/CHF)
        - Monitor labs-CMP, BNP-heart
        - Administer pharm.-Nitro, dopamine, dobutamine, milrinone, and morphine-chest pain and decreases work load
        - Calories of excess of 3000
        - Bedrest
        - Cluster activities to reduce fatigue
        - Hemodynamic monitoring
    - Treatment goals
        - To reduce trauma to heart and vital organs
        - To reduce stress and improve cardiac output-to save the heart
- Anaphylactic shock-allergic reaction
    - Treatment
        - Administer Epinephrine, Benadryl
        - Remove allergen from patient
        - Fluid management
        - Maintain patent airway (ABCs)
        - Nebulizer treatment if needed
- Neurogenic shock-spinal cord injuries
    - Manifestations
        - Hypotension
        - bradycardia
- Hypovolemic shock
    - Manifestations

        - Anxious
        - Urine output low
        - BP low
        - HR elevated
        - RR elevated
    - Resuscitation fluid options
        - Colloids
            - Albumin
        - Crystalloids
            - 0.9% NS
            - Lactated Ringers (LR)
        - Blood Products
            - Packed RBCs
            - FFP (fresh frozen plasma)
            - platelets
- Stages of shock
    - Manifestations
        - Initial- No change in BP, nurse can’t see any type of change but needs to be aware of the possibility/risk of shock
        - Compensatory-BP is still w/in normal ranges but pt has cool, clammy skin, hypoactive bowel sounds, decreased UO
            - RR may increase slightly
            - May have slight confusion
            - BP greater than 100
            - RR greater than 20; $PaCO_2$ less than 32 mm Hg

        - Respiratory alkalosis
    - Progressive-Changes in Vital Signs
        - Pt goes from A&OX4 to A&OX2
        - Stupor or comatose
        - GFR falls below 70
        - Dysrhythmias, ischemia
        - Crackles/rapid and shallow breathing observed
        - HR increased up to 150
        - Systolic less than 90
        - Skin-petechiae
        - Metabolic acidosis
    - Irreversible /Refractory
        - BP low
        - Multiple organ failure
        - Requires mechanical or pharm. Support to maintain BP
        - HR-erratic or asystole
        - Breathing requires intubation and mechanical vent./oxygenation
        - Skin-jaundice-liver failure
        - Zero urine output
        - unconscious
        - profound acidosis
        - edema/ascites d/t kidney failure
- Family education

        - Early prevention is the key
        - Tell family the truth about situation and possible outcome (transparent)

- Shock
    - Manifestations
        - Lowered BP
        - Decreased oxygenation to tissues
        - Confusion/lethargy
    - Interventions
        - Know which patients are at risk-prevention is key
        - Fluids
        - Hypoperfusion of tissues-monitor O2 saturation; capillary refill time
        - Hypermetabolism- that’s why we need extra calories (3000)
        - Activation of inflammatory response-Epi or Benadryl
    - Key assessments
        - LOC
        - Vital signs-BP, RR, HR, Temp
        - CBC w/diff
        - CMP or BMP
        - Urine output
        - Skin
        - ABGs