**Week 11:**

- Diabetes insipidus → deficit of AHD
  - Lab findings
    - Urine chemistry (think dilute)
      - Decrease specific gravity
      - Decreased osmolality
    - Serum chemistry (tink concentrated)
      - Increased osmolality
      - Increased sodium
      - Increased potassium
    - Diagnostic procedures: water deprivation test (ADH stimulation test & vasopressin test
  - Expected findings
    - Polyuria (abrupt onset of excessive urination → 4-30L/day)
    - Polydipsia
    - Nocturia
    - Fatigue
    - Dehydration
  - Pharmacologic treatment = desmopressin
    - Client Education:
      - Lifelong medication
      - Notify PCP if weight gain > 0.9kg in 24 hours; if HA or confusion occur
    - Nursing Considerations:
      - Monitor VS and urine output
      - Use cautiously if hx of CAD d/t vasoconstriction
      - Monitor for HA, confusion, or other indications of water intoxication
- Cushing's → excess cortisol
    - Disease → tumor in pituitary gland releasing ACTH increasing cortisol
    - Syndrome → long-term glucocorticoid use from asthma or RA
  - Manifestations
    - Weakness/fatigue
    - Altered emotional state (irritability, depression)
    - Decreased libido
    - Sleep disturbances
    - Back and joint pain
  - Physical assessment findings
    - Classic picture → central-type obesity, with a fatty "buffalo hump" in the neck and supraclavicular areas, a heavy trunk, and relatively thin extremities

        - Evidence of decreased immune function and decreased inflammatory response
        - Thin, fragile skin
        - Bruising/petechiae
        - Tachycardia
        - Gastric ulcers d/t over secretion of hydrochloric acid
        - Weight gain and increased appetite
    - Interventions
        - Labs: elevated plasma cortisol levels, plasma ACTH levels
        - XR, MRI, CT for potential lesion identification
        - Therapeutic: chemo, radiation, hypophysectomy, adrenalectomy
        - Medications: tapering glucocorticoids, Ketoconazole (antifungal inhibiting corticosteroid synthesis), Mitataine (selective destruction of adrenocortical cells), Hydrocortisone (replacement therapy)
        - RN considerations
            - Monitor I&O, daily wt, CBC WBC
            - Assess for hypervolemia
            - Maintain safe environment to minimize pathologic fracture and skin trauma
            - Reposition q2h and encourage physical activity w/in pt limitations
            - Frequent hand hygiene w/ meticulous skin care
            - Monitor for and protect against skin break down and infection
            - Surgical asepsis w/ dressing changes and invasive procedures
- Addison's → deficit of cortisol
    - Causes
        - Damage or dysfunction of adrenal cortex → diminished mineralocorticoid and glucocorticoid production resulting in decreased aldosterone and cortisol
        - TB and histoplasmosis are the most common infections that destroy adrenal gland tissue
        - Therapeutic use of corticosteroids is the most common cause of adrenocortical insufficiency
        - Surgical removal or infection of adrenal glands
        - Inadequate secretion of ACTH from the pituitary gland d/t decrease stimulation of the adrenal cortex
    - Manifestations
        - N/V/D/C/abdominal cramping
        - Dizziness w/ orthostatic hypotension
        - Hyperpigmentation
        - Weight loss/dehydration
        - Craving for salt
        - Hyponatremia/hypoglycemia
        - hyperkalemia/hypercalcemia
- SIADH → excess ADH

- Manifestations
  - Early:
    - HA
    - Weakness
    - Anorexia
    - Muscle cramps
    - Weight gain (w/o edema d/t water, not sodium, retention)
  - As serum Na+ decreases:
    - N/V/D
    - Personality changes
    - Hostility
    - Sluggish DTRs
    - Oliguria w/ dark yellow concentrated urine
- Interventions
  - RN considerations:
    - Restrict oral fluids
    - Monitor I&O and daily wt; urine and blood chemistry
    - Monitor VS → HTN, tachycardia, hypothermia
    - Auscultate lung sounds for pulmonary edema
    - Report altered mental status
    - Reduce environmental stimuli
  - Medications: tetracycline derivative (correct fluid/electrolyte imbalances by stimulating urine flow), vasopressin antagonist, loo diuretics, hypertonic sodium IV fluids

- Pheochromocytoma → excess catecholamines (epinephrine)
  - Rare condition caused by a tumor in the adrenal medulla
  - Avoid palpation of abdomen d/t risk of severe HTN
- Manifestations
  - Severe episodic hypertension accompanied by a severe, pounding HA, tachycardia w/ palpitations, profuse diaphoresis, and unexplained abdominal or CP
    - RN: monitor BP if “attack” is occurring
  - Classic triad → severe pounding HA, tachycardia, profuse sweating

- Thyroid storm
  - Rare, life threatening condition characterized by severe clinical manifestations of thyrotoxicosis
- Causes
  - Uncontrolled hyperthyroidism occurring most often with Grave’s disease
  - Acute event → infection, trauma, emotional stress, DKA, digitalis toxicity
  - Following a surgical procedure or a thyroidectomy as a result of manipulation of the gland during surgery
- Manifestations

        - Hyperthermia/hyperpyrexia (104-106F)
        - Delirium/agitation
        - Vomiting/abdominal pain
        - HTN/chest pain
        - Tachydysrhythmias/palpitations
    - Pharmacologic treatment
        - Beta blockers
        - Thionamide
        - Glucocorticoids
        - An iodine solution
        - An iodinated radiocontrast agent
    - Nursing interventions
        - Maintain a patent airway
        - Provide continuous cardiac monitor for dysrhythmias
        - Administer acetaminophen to decrease temperature
            - Salicylate antipyretics (ASA) are contraindicated because they release thyroxine from protein-binding sites and increase free thyroxine levels
- Myxedema
        - Coma that is rare but serious d/o results from persistently low thyroid production
        - Life-threatening condition that occurs when hypothyroidism is untreated or when a stressor (EX: acute illness, surgery, chemo, d/c thyroid replacement therapy, or use of sedative/opioid) affects the client who has hypothyroidism
    - Manifestations
        - Respiratory failure/hypoventilation
        - Hypotension
        - Bradycardia/dysrhythmia
        - Hypothermia
        - Hyponatremia/Hypoglycemia
        - Coma
    - Nursing interventions
        - Maintain airway patency
        - Initiate aspiration precautions
        - Administer IV fluids as prescribed

**Week 12:**

- Diabetes mellitus
    - Diagnostic labs and values pertinent to each (2 findings on separate days)
        - Fasting blood glucose >126 mg/dL (fasting= no caloric intake x 8hrs)
        - Manifestations of diabetes plus casual blood glucose concentration >200 mg/dL (w/o regard to time since last meal)
        - 2-hr glucose >200 mg/dL w/ oral glucose tolerance test

        - Glycosylated hemoglobin (A1C) >6.5% measures 8-12 weeks
        - Diabetics A1C: <7
        - None diabetics A1C: <5
- Hypoglycemia
    - Manifestations
        - Mild: hunger, nervousness, palpitations, sweating, tachycardia, tremor
        - Moderate: confusion, double vision, drowsiness, emotional changes, H, impaired coordination, inability to concentrate, irrational or combative behavior, lightheadedness, numbness of the lips and tongues, slurred speech
        - Severe: difficulty arousing, disoriented behavior, loss of consciousness, seizures
    - Interventions
        - Checks blood glucose level
        - For a conscious pt administer simple carbohydrate to treat hypoglycemia
            - Commercially prepared glucose tablets
            - 6-10 life savers or hard candy
            - 4 tsp of sugar
            - 4 sugar cubes
            - 1 tbsp of honey or syrup
            - ½ cup of fruit juice or regular (non diet) soft drink
            - 8 oz of low fat milk
            - 6 saltine crackers
            - 3 graham crackers
        - Recheck blood sugars after 15 mins of administering carbohydrates and give more if it is still low
        - If the client is unconscious administer glucagon subQ or IM. place the client into a lateral position to prevent aspiration
        - Should administer IV injection of 25-50mL of 50% dextrose in water
        - DO NOT GIVE AN UNRESPONSIVE PT ORAL FOODS
- DKA can occur after stress of the body such as an infection or trauma
    - Manifestations
        - Polyuria, polydipsia, and marked fatigue
        - Blurred vision, weakness, and headache
        - Orthostatic hypotension from loss of fluids
        - Frank hypotension with a weak, rapid pulse
        - GI symptoms such as anorexia, N/V, and abdominal pain
        - Acetone breath (a fruity odor)
        - Hyperventilation (with very deep, but not labored respirations) may occur-kussmaul respirations
        - Pt may be alert, lethargic, or comatose
    - Lab findings
        - Blood glucose levels 300-1000

        - Low serum bicarbonate, low pH; low PCO2, reflects respiratory compensation (Kussmaul's respirations)
        - Ketones bodies in blood and urine
        - Electrolytes vary according to degree of dehydration; increase in creatinine, Hct, BUN
        - Major electrolyte concern is POTASSIUM
    - Treatment
        - Rehydration- FLUID REPLACEMENT
        - Restoring electrolytes
        - Reverse acidosis
        - Initial fluid of choice is 0.9% NS- rate of infusion dependent on clinical state of patient
        - If hypernatremic- 0.45% saline in order to provide electrolyte free water
        - When the BG reaches 200-300 or less- changes to D5W to prevent decline in blood glucose level and so that insulin can be contributed to achieve ketones clearance
    - Insulin administration
        - Only regular insulin can be administered IV
        - Infused at a slow continuous rate to help reverse acidosis (5 units/hr)
        - Hourly blood glucose values must be measured
        - Insulin must be infused continuously until subQ administration of insulin can be resumed; any interruption in administration may result in the reaccumulation of ketone bodies and worsening conditions
- HHS- blood glucose levels 600-1200. Ketosis and acidosis does not generally occur in HHS
    - Treatment
        - Fluid replacement
            - Listen to lung sounds and monitor I&O's
        - Correction of electrolyte imbalances
        - Insulin administration
        - Insulin is usually administered at a continuous low rate to treat hyperglycemia, and replacement IV fluids with dextrose are administered after glucose level has decreased to the range of 250-300 mg/dL
- Pancreatitis
    - Manifestations
        - Sudden onset of severe, boring pain (goes through the body)
        - Epigastric, radiating back, left flank, or left shoulder
        - Worse when lying down
        - Pain unrelieved somewhat by fetal position or sitting upright, bending forward
        - N/V, weight loss
        - Turner's sign —> ecchymosis on the flanks
        - Bluish-gray periumbilical discoloration —> Cullen's sign
        - Generalized jaundice

        - Absent or decreased bowel sounds
        - Warm, moist skin, fruit breath
        - Ascites
    - Lab findings
        - Increased amylase & lipase
        - Increased wbc
        - Increased serum liver enzymes (ALT, AST) & bilirubin
    - Pain-relief interventions
        - Opioid analgesics (morphine, fentanyl)
- EGD
    - Client education pre-procedure
        - No eating 6-12 hours prior to procedure
        - Educate before because they will receive twilight sedation
        - Expect sore throat, light blood tinged sputum after EGD
    - Nursing interventions
        - Informed consent prior
        - Assess for gag reflex after
- GI bleeds
    - Priority assessment
        - Vital Signs—> assess for hypovolemia/shock (hypotension, tachycardia)
- AKI
    - Causes
        - Prerenal acute kidney injury
            - Renal vascular obstruction
            - Shock
            - Decreased cardiac output causing decreased renal profusion
            - Sepsis
            - Hypovolemia
            - Peripheral vascular resistance
            - Use of aspirin, ibuprofen, or NSAIDs
            - Liver failure
        - Intrarenal acute kidney failure
            - Physical injury: trauma
            - Hypoxic injury: renal artery or vein stenosis or thrombosis
            - Chemical injury: acute nephrotoxins (antibiotics, contrast dye, heavy metals, blood transfusion reaction, alcohol, cocaine)
            - Immunologic injury: infection, vasculitis, acute glomerulonephritis
    - Lab findings
        - Serum creatinine gradually increases 1 to 2 mg/dL every 24 to 48 hours, or 1 to 6 mg/dL in 1 week or less
        - BUN can be increased to 80 to 100 mg/dL within 1 week
        - Urine specific gravity varies in postrenal type, can be elevated up to 1.030 in prerenal type or diluted as low as 1,000 in intrarenal type

        - Sodium can be decreased in prerenal azotemia or increased intrarenal azotemia
        - Hematocrit is decreased
        - Urinalysis presence of sediment
        - Metabolic acidosis
- CKD
    - Dietary restrictions with examples of each
        - Instruct the client to monitor the daily intake of carbohydrates, proteins, sodium, and potassium, according to the provider's prescription
        - Instruct the client to avoid antacids containing magnesium
        - Drink at least 2 liters of water daily
        - Stop smoking and limit alcohol intake
    - Lab findings
        - Urinalysis: hematuria, proteinuria, and decrease in specific gravity
        - Serum creatinine: gradual increases over months to years for CKD exceeding 4 mg/dL. Can increase to 15 to 30 mg/dL
        - BUN increased with elevated serum creatinine
        - Decreased sodium and calcium; increased potassium, phosphorus, and magnesium
        - CBC: decreased hemoglobin and hematocrit from anemia secondary to the loss of erythropoietin in CKD
    - Nursing interventions
        - Report and monitor irregular findings
        - Assess and monitor vascular access or peritoneal dialysis insertion site
        - Obtain a detailed medication and herb history to determine the client's risk for continued kidney injury
        - Control protein intake based on the client's stage of CKD and type of dialysis prescribed
        - Restrict dietary sodium, potassium, phosphorus, and magnesium
        - Provide a diet that is high carbohydrates and moderate in fat
        - Restrict intake of fluids (based on urinary output)
        - Adhere to meticulous cleaning of areas on skin not intact and access sites to control infections
        - Balance the client's activities and rest
        - Prepare the client for hemodialysis, peritoneal dialysis, and hemofiltration if indicated
        - Provide skin care in order to increase comfort and prevent breakdown
        - Provide emotional support to the client and family
        - Encourage the client to ask questions and discuss fears
        - Administer medications as prescribed
- Peritoneal dialysis
    - What is it, how does the system work

        - Involves instillation of hypertonic solution into the peritoneal cavity and subsequent dwell times, drain the dialysate solution that includes the waste productions, the peritoneum serves as the filtration membrane
        - Client should have intact peritoneal membrane without adhesions from infection or multiple surgeries
- ESRD
    - Manifestations
        - Neurologic
            - Asterixis, behavior changes, burning of soles of feet, confusion, disorientation, inability to concentrate, restlessness of legs, seizures, tremors, weakness and fatigue
        - Integumentary
            - Coarse, thinning hair, dry and flaky skin, ecchymosis, gray-bronze skin color, pruritis, purpura, thin, brittle nails
        - Cardiovascular
            - Engorged neck veins, hyperkalemia, hyperlipidemia, hypertension, pericardial friction rub, pericardial tamponade, pericarditis, periorbital edema, pitting edema
        - Pulmonary
            - Crackles, depressed cough reflex, kussmaul-type respirations, pleuritic pain, shortness of breath, tachypnea, thick and tenacious sputum, uremic pneumonitis
        - Gastrointestinal
            - Ammonia odor to breath, anorexia, nausea, vomiting, bleeding from gastrointestinal tract, constipation or diarrhea, hiccups, metallic taste, mouth ulcerations and bleeding
        - Hematologic
            - Anemia, thrombocytopenia
        - Reproductive
            - Amenorrhea, decreased libido, infertility, testicular atrophy
        - Musculoskeletal
            - Bone fractures, bone pain, foot drop, loss of muscle strength, muscle cramps, renal costeodystrophy
- Kidney biopsy
    - Nursing interventions
        - Client receive sedation and ongoing monitoring
        - Pre-procedure
            - Obtain informed consent
            - Obtain urine specimen
            - Review coagulation studies
            - NPO for 4-6 hours
        - Post-procedure
            - Monitor VS following sedation
            - Assess dressings and UO (hematuria)

- Review Hgb and Hct values
- Administer prn pain medications

- Kidney transplants
  - Contraindications
    - Age <2
    - Age >70
    - Advanced, untreatable cardiac disease
    - Chemical dependency
    - Chronic infections or system diseases
    - Coagulopathies and certain immune diseases
    - Morbid obesity
    - DM
    - COPD
    - Untreated GI disease, such as peptic ulcer disease
  - Organ rejection manifestations
    - Hyperacute: occurs within 48 hours after surgery
      - Fever, hypotension, pain at the transplant site
    - Acute: occurs 1 week to 2 years after surgery
      - Oliguria, anuria, low-grade fever, hypotension, tenderness over the transplanted kidney, lethargy, azotemia, and fluid retention
    - Chronic: occurs gradually over months to years
      - Gradual return of azotemia, fluid retention, electrolyte imbalance, and fatigue
- Dialysis types
  - Hemodialysis: a procedure that circulates the patient's blood through an artificial kidney to remove waste products and excess fluid
  - Peritoneal dialysis: a procedure that uses the patient's peritoneal membrane ( the lining of the peritoneal cavity) as the semipermeable membrane to exchange fluid and solutes