NR324- Adult Health 1
EDAPT NOTES

	Fluid Volume Overload	Fluid Volume Deficit
Vital Signs	• normal temperature • tachycardia • bounding pulses • hypertension • tachypnea • decreased oxygen saturation	• hyperthermia • tachycardia • weak, thready pulses • hypotension • tachypnea
Symptoms	**Neurological**: weakness, visual changes, paresthesia, altered levels of consciousness (ALOC), seizures **Gastrointestinal (GI)**: ascites, increased motility, acute weight gain **Renal**: increased urine output **Respiratory**: crackles, cough, dyspnea (pulmonary edema) **Other**: peripheral edema, distended neck veins, skin cool with pallor	**Neurological**: dizziness, syncope, confusion, weakness, fatigue, seizures **Gastrointestinal (GI):** thirst, dry mucous membranes, nausea, acute weight loss **Renal**: oliguria **Respiratory**: hypoxia **Other**: diminished capillary refill, cool clammy skin, diaphoresis, sunken eyeballs, flat neck veins, poor skin turgor and tenting

--Osmotic pressure is measured in milliosmoles (mOsm) and may be expressed as either *fluid osmolarity* or *fluid osmolality*. Although the two terms are often used interchangeably, they are different measurements. (CONCENTRATION)

- Osmolarity measures the total milliosmoles per liter of solution (mOsm/L).
- Osmolality measures the number of milliosmoles per kilogram of water (mOsm/kg) and is the preferred measure to evaluate the concentration of plasma, urine, and other body fluids.

--Normal plasma osmolality is between 280 and 295 mOsm/kg. A value greater than 295 mOsm/kg indicates that the concentration of solute is too great or that water content is too little (water deficit).
--A value less than 275 mOsm/kg indicates too little solute for the amount of water or too much water for the amount of solute (water excess).
--Normal urine osmolality is between 100 and 1300 mOsm/kg and depends on fluid intake, amount of antidiuretic hormone (ADH) in circulation, and the renal response to ADH.

Several laboratory studies are used to identify altered fluid balance, such as:

- serum and urine osmolality
- blood urea nitrogen (BUN)
- serum electrolyte levels
- hemoglobin and hematocrit
- Radiology studies, such as a chest x-ray and an echocardiogram,
- Fluid overload everything decreases
- Fluid Deficit everything increases

Fluid Volume Overload	Fluid Volume Deficit
H&H: decreased	H&H: increased
BUN: decreased	BUN: increased
Urine specific gravity: decreased	Urine specific gravity: elevated
Serum sodium: decreased	Serum sodium: elevated
Blood osmolality: decreased	Blood osmolality: increased

Neurological Effects:

- **Fluid volume imbalances = electrolyte abnormalities which cause:**
  - Altered LOC
  - Confusion
  - Seizures
  - Others…
- **Nursing Interventions:**
  - Monitor LOC- imbalance can cause seizures
  - Monitor vital signs, labs, s&s
  - Take seizure precautions- protect client from further injury related to seizure
  - Admin anti seizure meds prn

Cardiovascular Effects:

- Heart failure and arrhythmias can reduce the cardiac output of the heart. When this occurs, fluid can back up into the lungs and peripheral circulation.
- **Nursing Interventions:**
  - Monitor bp, HR, CO- helps to determine if pt has volume loss or overload complications
  - Check 12 lead ECG- determine if there are dysrhythmias present & poss electrolyte imbalance
  - Check B-type natriuretic peptide (BNP) levels- det. If pt is developing heart failure
  - Admin diuretics & monitor electrolytes before, during, & after admin
  - Admin IV fluids if blood/ fluid is lost from intravascular compart- fluid restores volume in the intravascular compart. & expands remaining blood volume

Vascular Effects:

- Vascular system can move fluid into interstitial area causing EDEMA
- Monitoring & treating edema helps restore fluid balance
- **Nursing Interventions:**
  - Assess pitting & non pitting edema
  - Assess extremity using 6 P's
    - pulselessness, pain, poikilothermic, paresthesia, paralysis, & pallor
    - this assesses for peripheral circulation
  - Elevate extremity w/ 2 + pillows – reduces fluid volume in extremity
  - Apply anti embolic stockings & sequential compression devices- improves circulation
  - Admin diuretics prn- helps get rid of excess fluid volume

Edema

- Protein (albumin) in the ICF & ECF compartments create oncotic pressure in tissue to keep water inside the vascular system
  - Shift in albumin = fluid shift from vascular to interstitial fluid compart
- Assess "third spacing" by measuring pitting edema
- TX for edema= diuretics, stockings, elevation above heart, lower sodium in diet
- TX for edema for client w/ renal insufficiency= ACE inhibitor or temp. dialysis
- Monitor kidney function w/ treatment (BUN & creatinine levels are CRITICAL)
  - 0+ -- No pitting edema
  - 1+ -- Mild pitting edema (depression disappears)
  - 2+ -- Moderate pitting edema (depression disappears 10-15 sec)
  - 3+ -- Moderately severe pitting edema (depression last longer than 1 min)
  - 4+ -- Severe pitting edema (depression last longer than 2 min)

Respiratory Effects:

- Fluid imbalance can force the respiratory system to compensate by increasing or decreasing respirations (to help balance acid-base abnormalities)
- **Nursing Interventions:**
  - Elevate HOB to 45-90* (semi- high fowlers position) if pt is having SOB
    - This expands the lungs & moves unwanted fluid to bottom clearing the upper lung fields
  - Monitor RR, breathing patterns, O2
    - Helps identify any acid-base imbalance
  - Check ABG (arterial blood gas)
    - Help identify if gas exchange is affected
  - Admin oxygen therapy prn
    - Helps support gas exchange until fluid imbalance improves

GI Effects:

- GI system impact fluid balance significantly by moving large amounts of fluid & electrolytes quickly out of the vascular system
- **Nursing Interventions:**
  - Monitor intake & output
    - Helps determine if pt needs fluid or NG tube
  - Measure abdominal girth
    - Helps determine if pt has ascites or worsening s/s
  - Check liver function (AST, ALT, Total Bilirubin)
    - Helps determine if pt is developing complications
  - Admin diuretic (spironolactone) or Anti-diarrheal
    - Helps prevent excess fluid loss
  - Assist with paracentesis.
    - Helps reduce the amount of fluid trapped in abdomen due to liver failure or ascites

Genitourinary Effects:

- Kidneys helps body retain or lose fluid, they are also used to fix fluid imbalances or can cause fluid imbalance if they fail
- **Nursing Interventions:**
  - Monitor I/O
  - Monitor BUN & Creatinine (determines if kidneys are functioning properly)
  - Monitor ADH level & serum/ Urine osmolarity (helps r/o if pt has hormone imbalance like SIADH or DI)
  - Admin diuretics unless pt has acute kidney injury

Meds for Fluid Volume Overload

- Diuretics
  - Remember: If the potassium (K) level is high, avoid potassium-sparing diuretics (spironolactone, amiloride, triamterene). Instead, use either loop (furosemide, bumetanide) or thiazide diuretics. If the K level is low, avoid using loop or thiazide diuretics.
- Angiotensin-converting-enzyme (ACE) inhibitors--(captopril, enalapril)
- Beta blockers--(atenolol, metoprolol)
- Calcium channel blockers-- (nifedipine, felodipine)
- Syndrome of inappropriate antidiuretic hormone secretion (SIADH): tolvaptan

Meds for Fluid Volume Deficit

- Intravenous (IV) fluid replacements (isotonic, hypotonic, hypertonic)
- Blood transfusion, if needed
- Diabetes insipidus: desmopressin