

## **Adult Health Exam 2 Concept Review**

### **Fluid volume deficit**

#### **· Manifestations**

- Hypotension
- Concentrated urine (yellow) from dehydration
- Oliguria
- Decreased LOC
- Skin turgor tenting.

#### **· Diagnostic findings**

- Increased Hgb, Hct, Creatinine, Urine Specific Gravity, and BUN.
- Decreased Sodium.

### **Fluid volume overload**

#### **· Manifestations**

- Peripheral edema
- Crackles
- Hypertension
- Bounding pulse.

#### **· Nursing interventions**

- Low sodium diet (250mg/day max).
- Restrict fluids as prescribed.
- Diuretics as prescribed, Thiazide or High-Ceiling depending on severity.

#### **· Complications**

- Pulmonary edema
- Position in high fowlers to maximize ventilation
- Administer oxygen/or positive airway pressure
- Administer diuretics as prescribed

### **Normal Electrolyte Ranges**

- Sodium: 136 - 145
- Calcium: 9.0 - 10.5
- Potassium: 3.5 - 5.0
- Magnesium: 1.3 - 2.1
- Chloride: 98 - 106
- Phosphorus: 3.0 - 4.5

### **Electrolyte imbalances**

- o General risk factors
- o Understand which elevated or decreased values are most pertinent (this was discussed in class)

### Sodium imbalances (hypo/hyper)

- Hyponatremia

- Manifestations
  - o Poor skin turgor
  - o Dry mucosa, Headache
  - o Decreased salivation
  - o Hypotension
  - o Nausea,
  - o Abdominal cramping,
  - o Neurologic changes

- Hypernatremia

- Manifestations
  - o Seizures
  - o Thirst
  - o Elevated temperature
  - o Dry/Swollen tongue
  - o Sticky mucosa
  - o Neurologic changes,
  - o Restlessness, Weakness.

### Potassium imbalances (hypo/hyper)

- Hypokalemia

- Manifestations
  - o Muscle cramps (especially in calves),
  - o DTR's
  - o Paresthesia
  - o Thready, weak pulse
  - o Orthostatic hypotension,
  - o N/V, Constipation
  - o Abdominal distension.
- Nursing interventions
  - o Serial EKG
  - o Telemetry,
  - o I&O's
  - o Monitor LOC and cardiac rhythm.
  - o High potassium foods: Citrus Fruits dried figs, molasses, seaweed, nuts, avocado, wheat germ, and lima beans.

- **Treatment**
  - K-Rider (give w/ normal saline or it will burn/cause phlebitis, not given as IV push or bolus).
- **Patient education**
  - Potassium rich foods.
  - Teach that excessive diuretics and laxatives can cause hypokalemia.
- **EKG changes**
  - Prominent U Wave, Flat T wave, ST depression, Prolonged PR interval.

## Hyperkalemia

- **Manifestations**
  - Muscle weakness
  - Paresthesia
  - Anxiety
  - Slow irregular pulse
  - Hypotension
  - Restlessness
  - Diarrhea
  - Hyperactive bowels
  - Oliguria.
- **Nursing interventions**
  - Encourage avoiding high potassium foods
  - Monitor I&O's
  - Assess for muscle weakness.
- **Treatment**
  - Insulin, Glucose, Sodium bicarb Calcium gluconate,
  - Beta-2 adrenergic agonists (albuterol)
  - Kayexalate, and Loop or Thiazide Diuretics.
- **Patient education**
  - Teach to avoid Potassium rich foods.
- **EKG changes**
  - Peaked T-wave, Widened QRS, Ventricular Fibrillation, Premature Ventricular Contractions.

## Calcium imbalances (hypo/hyper)

### Hypocalcemia

- **Manifestation**
  - Positive Chvostek and Trousseau signs
  - Paresthesia

- Circumoral numbness
- Seizures
- Tetany, Hyperactive DTR's
- Dyspnea, Anxiety
- Abnormal Clotting
- **Twitching**
- Muscle spasms in the calf
- Hyperactive bowel sounds, Diarrhea.
- **EKG Changes**
  - Prolonged QT interval
  - Prolonged ST segment
  - Potential Torsades de pointes.

## Hypercalcemia

- **Manifestations**
  - Muscle weakness
  - Incoordination
  - Anorexia
  - Constipation
  - N/V
  - Polyuria
  - Thirst
  - Abdominal and Bone pain.
- **EKG Changes**
  - Shortened QT interval.
- **ABG**
  - **Components of ABG**
    - pH- amount of free hydrogen ions in the arterial blood **7.35-7.45**
    - PaO<sub>2</sub>- partial pressure of oxygen **80-100**
    - PaCO<sub>2</sub>- partial pressure of carbon dioxide **35-45**
    - HCO<sub>3</sub><sup>-</sup>- concentration of bicarbonate in arterial blood **21-28**
    - SaO<sub>2</sub>- percentage of oxygen bound to Hgb as compared with the total amount that can be possibly carried **95%-100%**

- o **Interpreting results (Acid-Base imbalances)**
  - Respiratory acidosis = low pH high PaCO<sub>2</sub>
  - Respiratory alkalosis = high pH normal PaCO<sub>2</sub>
  - Metabolic acidosis = low pH normal PaCO<sub>2</sub> low HCO<sub>3</sub>
  - Metabolic alkalosis = high pH normal PaCO<sub>2</sub> high HCO<sub>3</sub>
  - Homeostasis = normal pH, PaCO<sub>2</sub>, HCO<sub>3</sub>
  
- **EKG findings from imbalances**
  - o **Hypokalemia = Prominent U-Wave**
  - o **Hyperkalemia = Wide flat P, Peaked T-Wave, Wide QRS**
  - o **Hypocalcemia = Prolonged QT interval**
  - o **Hypercalcemia = Shortened QT interval**
  - o
  
- **Respiratory Alkalosis- high pH, normal PaCO<sub>2</sub>, normal HCO<sub>3</sub>. Hyperventilation**
  - o **Nursing interventions**
    - Non-rebreather mask
  
- **Septic shock- INFECTION**
  - o **Assessment findings**
    - Increased temperature
    - Increased WBC
    - Vasodilation

- Maldistribution
- Myocardial depression
- Persistent hypotension

- o **Nursing interventions**

- Antibiotics
- Hand hygiene

- **MODS- ANY TYPE OF SHOCK, USUALLY BEGINS IN THE LUNGS**

- o **Nursing interventions**

- Keep patient and family informed
- Keep patient comfortable
- Be very transparent on patient status
- Continuously assess oxygen system

- o **Priority**

- **PREVENTION IS PRIORITY**

- **Cardiogenic shock-** hearts ability to contract and pump blood is impaired and the supply of oxygen is inadequate for the heart and tissues

- o **Causes**

- Cardiomyopathies

- Valvular damage
- Cardiac tamponade
- Dysrhythmias
  
- o **Nursing interventions**
  - Bedrest
  - Cluster care
  - Uninterrupted rest
  
- o **Treatment goals**
  - Limit further myocardial damage
  - Preserve healthy myocardium
  - Improve cardiac function by increasing cardiac contractility, decrease ventricular afterload or both

• **Anaphylactic shock - allergic reaction, STRIDOR**

- o **Treatment**
  - Maintain patent airway
  - **IM EPI**

• **Neurogenic shock – SPINAL CORD INJURY, PROMOTE STABILITY  
C-COLLAR**

- o **Manifestations**

- Decreased blood pressure (hypotension)
- Decreased heart rate (bradycardia)

- **Hypovolemic shock – MOST COMMON**

- o **Manifestations**

- **Increased heart rate**
    - **Increased respiratory rate**
    - **Decreased blood pressure**
    - Anxious
    - Decreased urine output

- o **Resuscitation fluid options**

- Normal saline 0.9
    - Lactated ringers (need to be cautious as does not hang well with certain meds)

- **Stages of shock**

- o **Initial** – no visible changes in client's parameters, only changes at the cellular level

- o **Compensatory**

- Maintains BP and cardiac output
    - Body shunts blood to the heart, lungs, and brain

- o **Manifestations**
- o Cool, clammy skin
- o Hypoactive bowel sounds
- o Decreased urine output
- o Perfusion of tissue is inadequate
- o Increased RR
- o Confusion
  
- o **Family education – early intervention is key**
  
- **Vital signs are key indicators of hemodynamic status. By the time the BP has dropped, damage has already been occurring at the cellular and tissue levels.**
  
- **Progressive – compensatory mechanisms begin to fail, all organs suffer from hypoperfusion**
  - o **Manifestations**
    - Mental status further deteriorates to hypoxia
    - Vasoconstriction continues to compromise cellular perfusion
    - Ischemia
    - Acute renal failure
    - MAP falls below 70. GFR cannot be maintained
    - Liver, GI, and hematological function affected

#### **Medical management**

- Supporting the respiratory system
- Optimizing intravascular volume
- Supporting the pumping action of the heart
- Improving the competence of the vascular system

#### **Family Education**

- Monitor for overload, ABG's
- Need 3,000 calories
- Monitor blood sugars
- Monitor tele strip
- Maintain good temperature (try to avoid drastic change)
- Keep family informed of patient status

### Irreversible- does not respond to treatment

- **Manifestations**
  - BP remains low
  - Renal, liver function fail
  - Multiple organ disfunction progresses to complete organ failure
  - Shock is irreversible

### Family education

- still need to explain treatment to patient and family member
- be transparent
- try everything to fix the problem

### Clinical Findings in Stages of Shock

Finding	Compensatory	Progressive	Irreversible
Blood Pressure	Normal	Systolic <90 mm Hg; MAP <65 mm Hg Requires fluids resuscitation to support blood pressure	Requires mechanical or pharmacologic support
Heart Rate	>100	>150	Erratic or asystole
Respiratory Status	>20 breaths/min PaCO2 <32 mm Hg	Rapid, shallow respirations; crackles PaO2 <80 mm Hg PaCO2 >45 mm Hg	Requires intubation and mechanical ventilation and oxygenation
Skin	Cold, clammy	Mottled, petechiae	Jaundice
Urinary Output	Decreased	<0.5mL/kg/h	Anuric, requires dialysis
Mentation	Confusion &/or agitation	Lethargy	Unconscious
Acid-Base Balance	Respiratory Alkalosis	Metabolic acidosis	Profound acidosis

- **Shock** – progresses along continuum, can be early or late, depending on signs and symptoms and overall severity of organ dysfunction. **Can be from blunt force trauma**

- o **Manifestations**

- Normal BP
- Buildup of lactic acid
- Increase in RR
- Raise in blood pH
- Feel anxious or confused

- o **Interventions**

- Try to get body back to homeostasis

- o **Key assessments - Vital Signs**