# N441 Concept Review Exam 2

1. **Total water composition**
   a. Intracellular (ICF)

2/3 of total body water
Major anion :potassium and magnesium
Major cations: proteins and organic phosphates

   b. Extracellular (ECF)
   c. 1/3 of total body water

Cations: sodium
Anion: chloride and bicarbonate
1. interstitial fluid: fills spaces between cells, blood plasma water leaking from capillaries
2. intravascular: Blood plasma is considered an **intravascular fluid**.

c. Third spacing : Fluid accumulation in the interstitium of tissues, as in edema, e.g. loss of fluid into the interstitium and lumen of a paralytic bowel following surgery (think of the intravascular and intracellular spaces as the first two spaces)

2. **Regulation of Fluid**
   a. Heart/Blood vessels: regulate blood pressure

b. Lungs: expel water along with carbon dioxide.
nsensible fluid loss; and are involved in acid-base balance;

c. Kidneys: kidneys regulate the pH by reabsorbing or eliminating hydrogen ions as needed. responsible for long-term pH regulation.

d. Pituitary: by the "Thirst Center" located in the hypothalmus
ADH; Anti-Diuretic Hormone. Prevents peeing to ..."Conserve Water"/retain water; regulates water by acting on the kidneys to ↑ total body H20 reabsorption; ↑'s BP, ↑'s total blood volume

3. **Hypovolemia/Hypervolemia**
   a. s/s Hypovolemia

- **Rapid heartbeat**.

anxiety
GI Bleeding
Ectopic Pregnancy
blue lips and fingernails
low or no urine output
profuse sweating
shallow breathing
dizziness
confusion
chest pain
loss of consciousness
low blood pressure

rapid heart rate
weak pulse

b. Nursing Management Hypovolemia

-Check for patent airway and adequate circulation.
-Begin an I.V. infusion with normal saline solution or lactated Ringer's solution delivered through a large bore.
-Help insert a central venous line and pulmonary artery catheter for hemodynamic monitoring.
-Insert an indwelling urinary catheter.
-Draw an arterial blood sample to measure ABG levels.
-Obtain and record the patient's blood pressure, pulse and respiratory rates, and peripheral pulse rates.
-Monitor the patient's CVP, right arterial pressure, pulmonary artery pressure, and cardiac output at least hourly as ordered.
-Measure the patient's urine output hourly.
-Monitor the patient's ABG and electrolyte levels frequently as ordered.
-Watch for signs of impending coagulopathy such as petechiae, bruising, bleeding or oozing from guns or venipuncture site.
-Explain all procedures and their purposes to ease the patient's anxiety.
-Discuss the risk associated with blood transfusions to the patient and his family.

d. Isotonic solutions Hypovolemia

Lactated Ringer's Solution for hypovolemia, Caution in patients with renal failure
First-line fluid resuscitation for burn and trauma patients.
Also, 0.9% NaCl

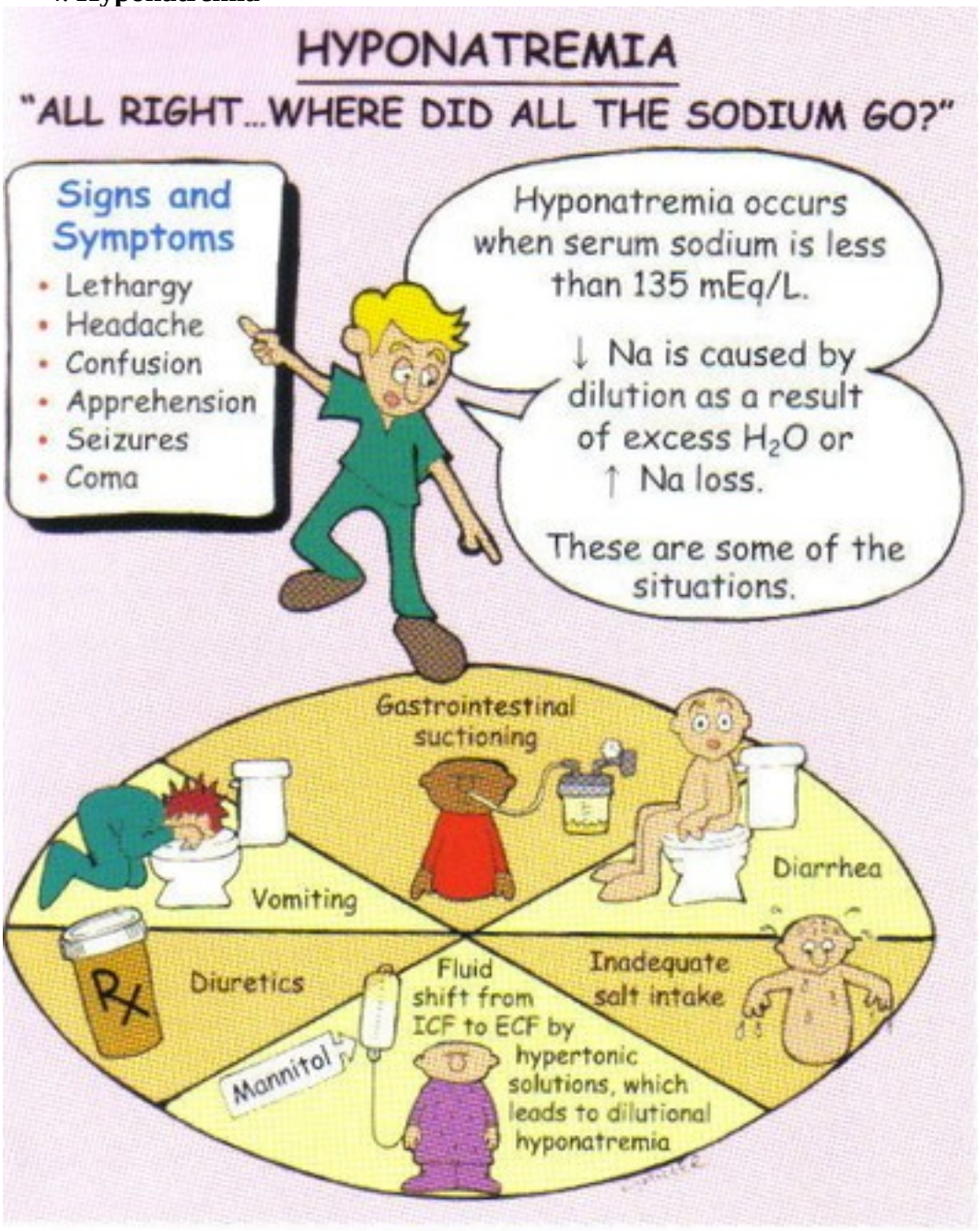
S/S Hypervolemia

distended neck veins/peripheral veins (vessels are full), peripheral edema (3rd spacing-vessels leaking), CVP increase (**more volume/more pressure**), crackles/SOB (in bases), polyuria, tachycardia (full & bounding), HTN, increase weight

nursing management hypervolemia

measure I&O
Daily weight
Breath sounds
level of edema
promote rest
restrict diet intake of sodium and fluids
administer appropriate meds
Place pt. in semi fowlers if dyspnea is present
Use of antiembolism stockings or compression devices
Turn pt. in bed regularly
monitor sodium levels
monitor response to meds

4. **Hyponatremia**




a. Contributing Factors

Common causes include diuretic use, **diarrhea**, **heart failure**, liver disease, renal disease, and the syndrome of inappropriate antidiuretic hormone secretion (SIADH).

b. s/s

S-Seizures and stUPOR

A- abdominal cramping, attitude changes/confusion

L-lethargic

T-tendon reflexes diminished, trouble concentrating - confused

L-loss of year and an appetite

O-orthostatic hypotension, overactive bowel sounds

S-shallow respirations - happens late due to skeleton muscle weakness

S-spasms the muscles

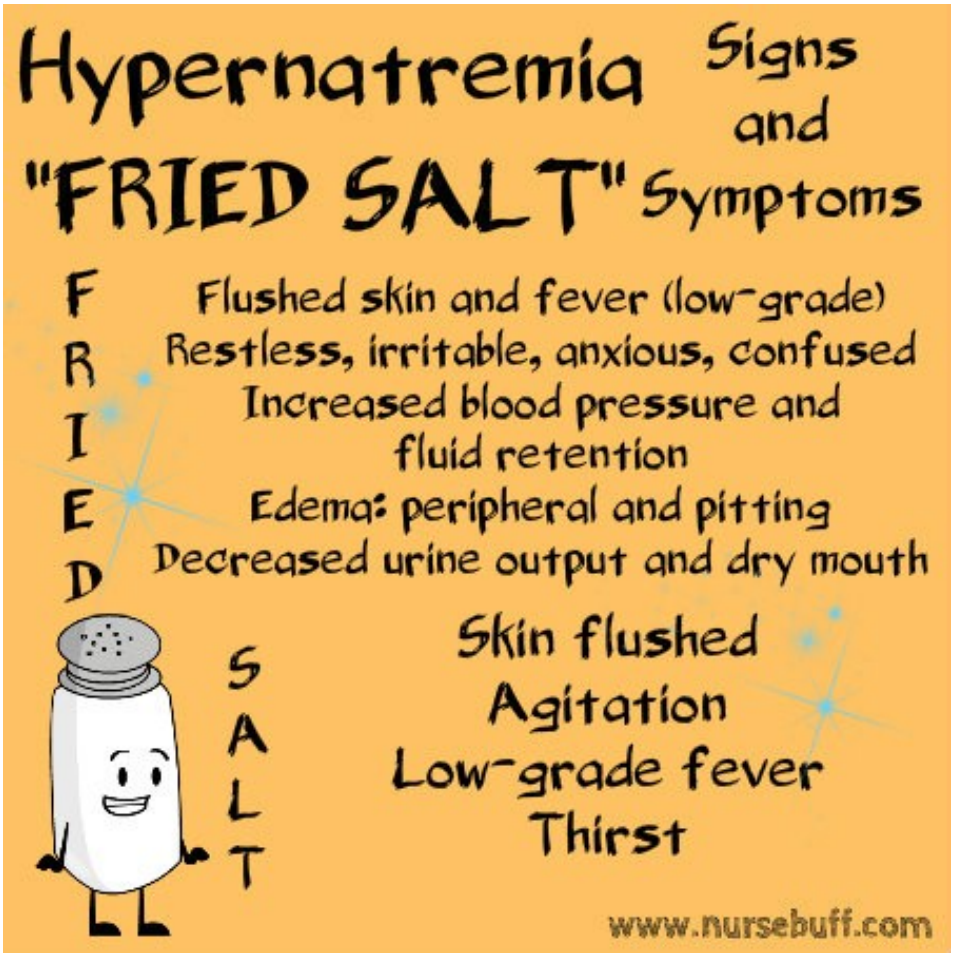
c. Nursing Management
d. Watch cardiac, respiratory, neural, renal, and G.I. status

HypoVOLEMIC hyponatremia- give IV sodium chloride infusions to restore sodium and fluids - 3% saline hypertonic solution..... Harsh on the veins.. Give an ICU usually do central lines very slowly..... Must watch for fluid overload.....

HYPERVOLEMIC hyponatremia- restricts fluid intake and in some cases administer diuretics to excretion the extra water rather than sodium to help concentrate the sodium. If the patient has renal impairment they may need dialysis.

Caused by-SIADH are antidiuretic hormone problems - fluid restrictions or treated within antidiuretic hormone Antagonist called declomycin which is part of the tretracycline family- don't give with food especially diary or antacids.... bind to cations and this affects absorption

**Hypernatremia**




e. Contributing Factors
f. Drinking too little
g. Vomiting
h. Having diarrhea
i. Using diuretics (drugs that increase urination)
j. Sweating excessively

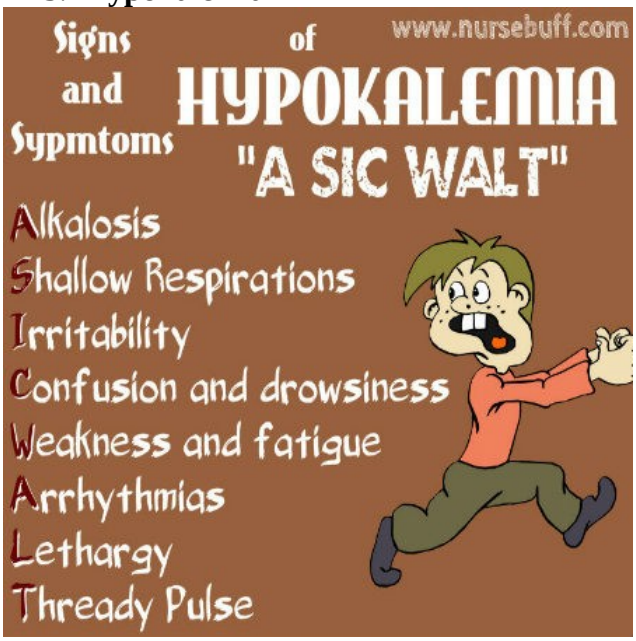
k. s/s
l. confusion, muscle twitching, seizures, coma, and death.
m.
n. Nursing Management
o. Obtain a drug history to check for drugs that promote sodium retention.
Give water replacement orally if the patient is alert and responsive. Administer I.V. fluid replacement based on the underlying cause to assist in normalizing serum sodium levels; ensure patent I.V. access.
Obtain blood specimens frequently to evaluate serum electrolyte levels, as frequently as every 1 to 2 hours if necessary.

Obtain urine specimens to evaluate urine osmolality.
Assist with oral hygiene measures.
Observe for signs of cerebral edema during fluid replacement therapy.
Assist with measures to address underlying conditions (such as diabetes).

p. Serum sodium levels
Urine osmolality
Cardiopulmonary status
Renal function
Intake and output
Daily weight
Hydration status
Neurologic status

q. 12- or 24-hour timed urine collection
12-lead electrocardiogram (ECG)
Blood pressure assessment
Cardiac monitoring

5. **Hypokalemia**




a. Contributing Factors
b.

Acid-base imbalances
Certain drugs, especially potassium-wasting diuretics, steroids, and certain sodium-containing antibiotics (carbenicillin)
Chronic renal disease, with tubular potassium wasting
Cushing's syndrome
Excessive GI or urinary losses, such as vomiting, gastric suction, diarrhea, dehydration, anorexia, or chronic laxative abuse
Excessive ingestion of licorice

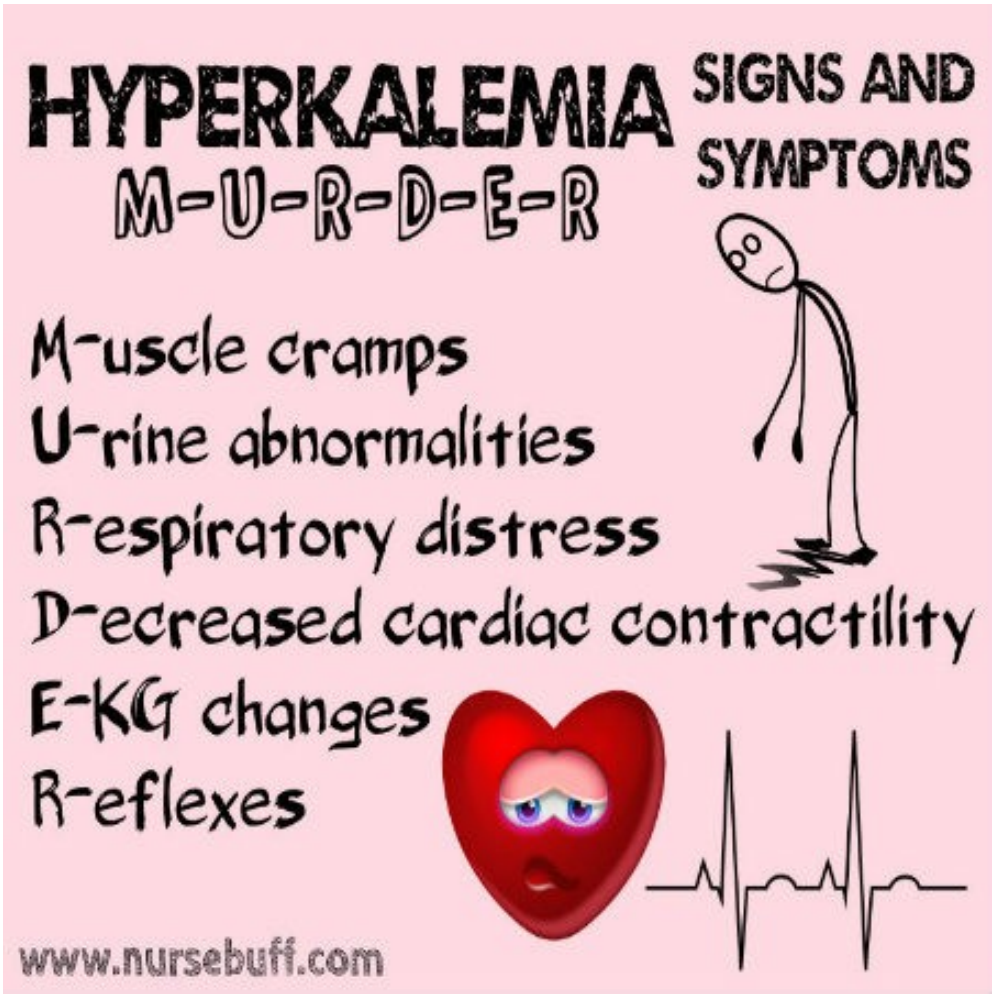
Hyperglycemia
Low-potassium diet
Primary hyperaldosteronism
Prolonged potassium-free I.V. therapy
Severe serum magnesium deficiency
Trauma (injury, burns, or surgery)

b. s/s

c. Nursing Management

Give prescribed drugs. If administering potassium chloride I.V., administer it slowly, at a rate not greater than 10 mEq/hour and with a concentration not exceeding 40 mEq/L. If possible administer it via central venous access, which allows up to 40 mEq in 100 mL to be given over 1 hour; check institution's policy for administration guidelines.
Institute continuous cardiac monitoring if the patient is receiving an I.V. potassium replacement.
Obtain specimens for laboratory testing, including frequent serum potassium levels.
Insert an indwelling urinary catheter, as indicated; assess urine output hourly.
Implement safety measures.
Inspect the abdomen and auscultate for bowel sounds. Report any changes.
Ensure that bathroom facilities are readily available, and assist with perianal care as necessary.
Provide high-potassium foods.
Be alert for signs of hyperkalemia after treatment.

**Hyperkalemia**




a. Contributing Factors
b. Adrenal gland insufficiency
   Burns
   Certain drugs
   Crushing injuries
   Decreased urinary excretion of potassium
   Dehydration
   Diabetic acidosis
   Increased intake of potassium (rare)
   Large quantities of blood transfusions
   Renal dysfunction or failure
   Severe infection
   Use of potassium-sparing diuretics such as triamterene by patients with renal disease

b. s/s

Hypotension
Irregular heart rate
Irregular heart rhythm

Decreased deep tendon reflexes
Flaccid paralysis

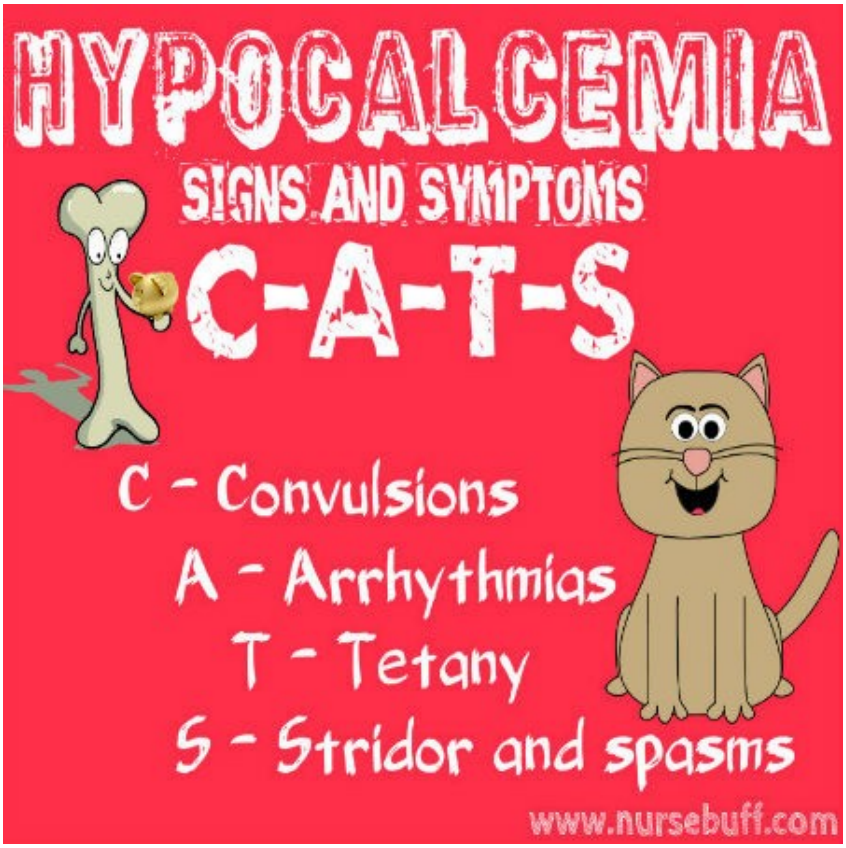
c. Nursing Management

Check the serum sample.
Give prescribed drugs:
Administer I.V. calcium and insulin along with inhaled beta-adrenergic blockers as initial treatment to stabilize the patient; give calcium slowly over 20 to 30 minutes.

Once stabilized, administer sodium polystyrene sulfonate and diuretics to help reduce total body potassium.

Anticipate the need for dialysis if the patient doesn't respond to treatment.
Administer I.V. calcium and insulin along with inhaled beta-adrenergic blockers as initial treatment to stabilize the patient; give calcium slowly over 20 to 30 minutes.
Once stabilized, administer sodium polystyrene sulfonate and diuretics to help reduce total body potassium.
Anticipate the need for dialysis if the patient doesn't respond to treatment.
Obtain specimens for serum potassium levels every 2 to 4 hours until stable.
Institute continuous cardiac monitoring if serum potassium level is greater than 6 mEq/L.
Insert an indwelling urinary catheter to evaluate hourly urine output.
Ensure a low-potassium diet.
Implement safety measures.
Be alert for signs of hypokalemia after treatment.

6. **Hypocalcemia**




a. Contributing Factors
b. Hypomagnesemia
   Hypoparathyroidism
   Hyperphosphatemia
   Inadequate dietary intake of calcium and vitamin D
   Malabsorption or loss of calcium from the GI tract
   Overcorrection of acidosis
   Pancreatic insufficiency, acute pancreatitis
   Hepatic disease
   Renal failure
   Severe infections or burns
   Sepsis
   Rhabdomyolysis
   Vitamin D deficiency
   Medications, such cinacalcet hydrochloride, chemotherapy (cisplatin, 5-fluorouracil, and leucovorin), bisphosphonates, anticonvulsants (phenytoin or phenobarbital), and foscarnet sodium
   Hypoalbuminemia (most common cause)
   Osteoblastic metastasis

c. s/s

Findings

Twitching
Carpopedal spasm
Tetany
Hypotension, bradycardia
Confusion, hallucinations
Positive Chvostek's and Trousseau's signs
Coarse hair
Dry scaly skin
Brittle nails; transverse nail grooves
Dyspnea

c. Nursing Management

Provide safety measures; institute seizure precautions, if appropriate.
Give prescribed calcium replacement. Administer intravenous calcium gluconate over 10 to 20 minutes to prevent serious cardiovascular compromise; dilute the calcium in water or saline because the drug is irritating to the veins.
Administer I.V. magnesium, as ordered, over 10 to 20 minutes followed by 1 g in 100 mL of fluid per hours. Expect to continue administration until serum magnesium level is greater than 0.8 mEq/L or 1 mg/dL.
Ensure adequate fluid intake for a patient receiving calcitriol.
Administer calcium chloride slowly, if possible via central venous access to prevent I.V. site complications. If using a peripheral I.V. access site, ensure the patency and integrity of the site, because infiltration causes sloughing.
Provide adequate dietary calcium intake; enlist the aid of a dietitian to assist the patient with food selection and meal planning.
Obtain specimens for laboratory testing every 4 to 6 hours or more frequently to determine electrolyte levels and monitor the effectiveness of therapy.
Institute continuous cardiac monitoring if appropriate to evaluate for electrocardiogram changes.
Ensure a patent airway; have emergency respiratory equipment readily available.
Prepare the patient and family for parathyroidectomy, if indicated.

**Hypercalcemia**

a. Contributing Factors
b. Certain cancers (common cause)
   Certain drugs
   Hyperparathyroidism (common cause)
   Hypervitaminosis D (which increases both intestinal calcium absorption and bone resorption)
   Hypervitaminosis A
   Multiple fractures and prolonged immobilization
   Milk-alkali syndrome

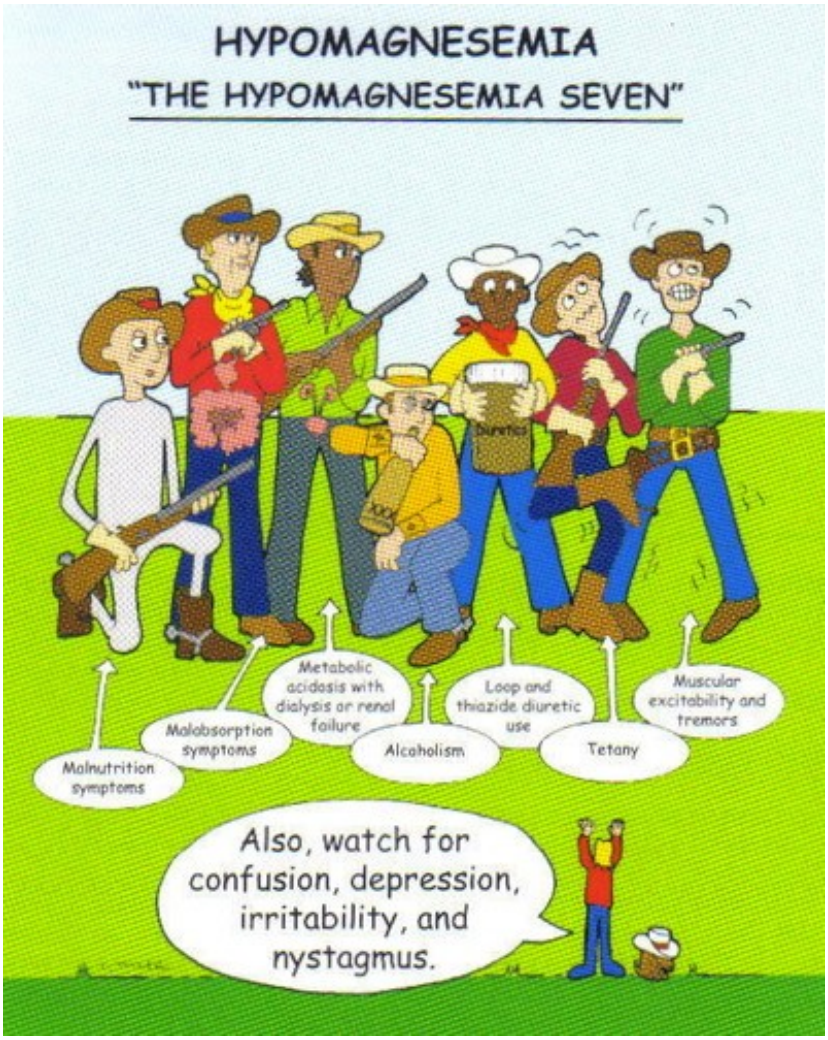
b. s/s

1. cardiac dysrhythmias (Blocks), shortening of QT interval and ST segment
2. Muscle weakness, incoordination

3. anorexia, constipation
4. Increased calcium aggravates digoxin toxicity

d. Nursing Management
e. Provide safety measures and institute seizure precautions, if appropriate.
Give prescribed I.V. solution; ensure patent I.V. access.
Expect to administer I.V. normal saline for severe hypercalcemia at an initial rate of 200 to 300 mL/hour, and then adjust to maintain urine output at 100 to 150 mL /hour.
Ensure readily available access to a bathroom if the patient is receiving I.V. saline.
Assess for signs and symptoms of fluid overload.
Assess for flu-like symptoms if the patient is receiving I.V. bisphosphonates.
Administer I.M. or subcutaneous calcitonin every 12 hours, if ordered.
Auscultate heart and lung sounds, noting signs and symptoms of heart failure.
Institute continuous cardiac monitoring if patient exhibits ECG changes.
Obtain specimens for laboratory testing, including serum calcium levels.
Assess for signs and symptoms of hypocalcemia secondary to treatment.
Assess level of orientation and note any changes.
Prepare the patient and family for surgery, if indicated.

7. **Hypomagnesemia**




a. Contributing Factors
b. Administration of parenteral fluids without magnesium salts
   Certain drugs
   Chronic alcoholism
   Chronic diarrhea
   Diabetic acidosis
   Excessive release of adrenocortical hormones
   Hyperaldosteronism
   Hypercalcemia

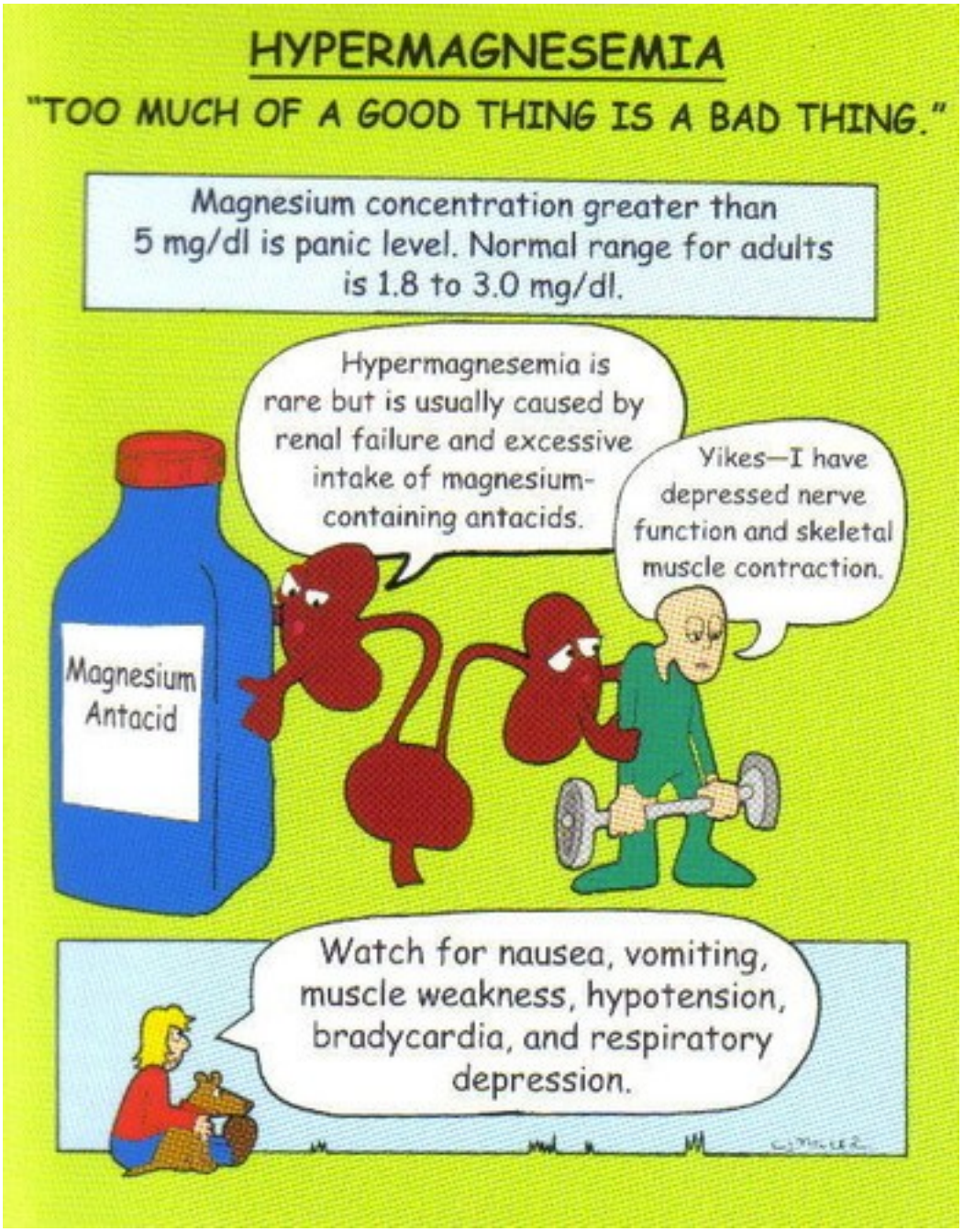
b. s/s

Tachycardia
Hypertension
Muscle weakness, tremors, twitching
Hyperactive deep tendon reflexes
Chvostek's and Trousseau's signs
Nystagmus

Ataxia
Cardiac arrhythmia

c. Nursing Management
d. Electrocardiography may show abnormalities, such as ST-segment depression; prolonged PR intervals; widened QRS complexes; tall, peaked T waves; and U waves.
e. Replacement of magnesium
   Increased magnesium in diet, such as green vegetables, legumes, nuts and seeds, and whole unrefined grains
f. Take measures to promote patient safety, including instituting seizure precautions.
   Provide support and comfort, and allow the patient to verbalize feelings of anxiety.
   Reorient the patient as needed.
   Give prescribed drugs. Observe for diarrhea associated with magnesium gluconate administration.
g. If administering magnesium sulfate, ensure patent I.V. access; closely evaluate respiratory rate, deep tendon reflexes, and renal function; and frequently monitor serum magnesium levels to reduce the risk of toxicity.
   Administer oral magnesium daily in divided doses.
   Have calcium gluconate readily available at the bedside if the patient is receiving parenteral magnesium.
   Obtain specimens for laboratory testing, including serum magnesium, calcium, and potassium levels; report abnormal serum electrolyte levels immediately.

**Hypermagnesemia**




a. Contributing Factors
b. Addison's disease
   Adrenocortical insufficiency
   Chronic renal insufficiency
   Overcorrection of hypomagnesemia
   Overuse of magnesium-containing antacids
   Severe dehydration (resulting oliguria can cause magnesium retention)
   Untreated diabetic ketoacidosis
   Hypothyroidism

Hypoparathyroidism
Use of laxatives (magnesium sulfate, milk of magnesia, and magnesium citrate solutions), especially with renal insufficiency
Intestinal hypomotility due to narcotics and anticholinergics or bowel obstruction and chronic constipation
Lithium intoxication
Rhabdomyolysis
Tumor lysis syndrome

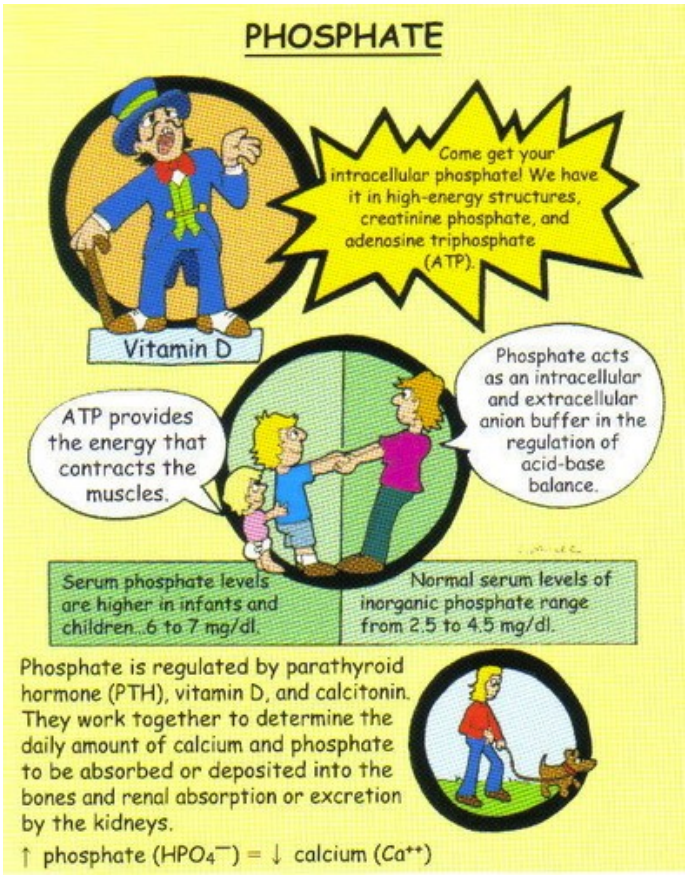
b. s/s

1. Hypotension
2. Cardiac arrest
3. Respiratory depression
4. Neurologic : Deep tendon reflexes decreased

c. Nursing Management

Institute continuous cardiac monitoring as indicated and report any changes.
Provide sufficient fluids for adequate hydration and maintenance of renal function. Administer I.V. fluid therapy as ordered to treat hypotension and maintain renal function; ensure patent I.V. access if I.V. fluids are ordered.
Expect to stop I.V. fluids when the patient's hemodynamic status is stabilized or pulmonary edema develops.
Give prescribed drugs; administer furosemide I.V. as a single dose.
Use calcium gluconate solution for patients with severe or symptomatic hypermagnesemia.
Obtain specimens for laboratory testing of serum electrolyte levels. Keep in mind that hypermagnesemia rarely occurs in isolation; also evaluate serum potassium and calcium levels, and report abnormal serum electrolyte levels immediately.
Watch patients receiving a cardiac glycoside and calcium gluconate simultaneously because calcium excess enhances the cardiac glycoside.
Prepare the patient for dialysis as indicated if the patient has renal failure and severe elevation of magnesium levels.

8. **Hypophosphatemia**




a. Contributing Factors

b. Chronic diarrhea
Chronic use of antacids containing aluminum hydroxide
Diabetic acidosis
Heavy metal intoxication
Hyperparathyroidism with resultant hypercalcemia
Hypomagnesemia
Inadequate dietary intake of phosphorus
Intestinal malabsorption of phosphorus
Commonly related to malnutrition resulting from a prolonged catabolic state or chronic alcoholism
Renal tubular defects
Tissue damage in which phosphorus is released by injured cells
Use of parenteral nutrition solution with inadequate phosphate content
Vitamin D deficiency
Drugs, such as loop diuretics, acetazolamide, bisphosphonates, cisplatinum, bevacizumab, and carmustine (see Drugs that may cause hypophosphatemia)
Acute respiratory alkalosis, hyperventilation

b. s/s

1. Affects CNS, cardiac, neuro and blood
2. Disorientation, confusion, seizures, muscle weakness
3. Tremor, dysphagia

Possibly asymptomatic if hypophosphatemia is mild
Anorexia
Memory loss
Muscle weakness
Muscle and bone pain
Fractures
Chest pain
Irritability
Dysphagia

c. Nursing Management
d. provide safety measures, including fall precautions if hypophosphatemia is severe.
Institute seizure precautions, if indicated.
Give phosphorus replacements as prescribed; if the parenteral form is used, administer it slowly to prevent subsequent hypocalcemia, tetany, and hypotension.
Assist with ambulation and activities of daily living; provide gentle range-of-motion exercises as indicated.
Work with the patient to develop a diet plan with high-phosphorus foods; enlist the aid of a dietitian as necessary for food selection and meal planning.
Obtain specimens for laboratory testing, including serum calcium and phosphorus levels.

**Hyperphosphatemia**

a. Contributing Factors
b. Acid-base imbalance
Certain drugs
Trauma, burns, crush injuries, or heat-related illnesses
Prolonged immobilization
Massive hemolysis
Severe infections
Hypervitaminosis D
Hypocalcemia
Hypoparathyroidism
Overuse of laxatives with phosphates or phosphate enemas
Renal failure
Neoplasms
Acidosis (metabolic or respiratory)
Tumor lysis syndrome
Rhabdomyolysis

b. s/s

1. hypocalcemia
2. tetany
3. mental changes

Anorexia
Decreased mental status
Nausea and vomiting
Muscle cramping
Paresthesia

c. Nursing Management

Provide safety measures to reduce the risk of injury.
Be alert for signs of hypocalcemia.
Give prescribed drugs. Administer oral phosphate binders with meals
Ensure patent I.V. access for medications and fluid administration as appropriate.

9**. Laboratory Testing (Normal/Abnormal Values)**

a**.** Creatinine: 0.84 to 1.21
b. Hematocrit 41% to 50%.
c. Urine sodium: 40-220 mEq/day

10. **Acid Base Balance (Normal/abnormal)**

a. pH 7.35-7.45.
b. PaCO2 35-45 mmHg
c. HCO3 22-26 mEq/L

d. PaO2 75 to 100 mmHg.

e. O2 Sat 90-100

11. **Acidosis/Compensation**

a. Metabolic: Compensation: (Respiratory compensation) Increased exhalation of CO2 by hyperventilation. Takes 12-24 hours to become fully active

b. Respiratory: Increased rate and depth of respirations to blow off CO2. Kidneys eliminate H+ ions and retain HCO3-(urine pH less than 6) HCO3- levels rise when the body is compensating for the **acidosis**.

12. **Alkalosis/Compensation**

a. Metabolic:

**Compensation** for **metabolic alkalosis** occurs mainly in the lungs, which retain carbon dioxide ($CO_2$) through slower breathing, or hypoventilation (respiratory **compensation**). $CO_2$ is then consumed toward the formation of the carbonic acid intermediate, thus decreasing pH.

b. Respiratory:

In chronic **respiratory alkalosis**, the kidneys decrease $H^+$ secretion, which produces a decrease in the serum $HCO_3^-$ concentration. Metabolic **compensation** for a **respiratory**

**alkalosis** develops gradually and takes 2-3 days. In chronic **compensation**, plasma bicarbonate falls by 4 for each 10 mm Hg decrease in the $Pco_2$.

13. **Shock**
    a. Cardiogenic
        1. s/s

- Rapid breathing
- Severe shortness of breath
- Sudden, rapid heartbeat (tachycardia)
- Loss of consciousness
- Weak pulse
- Low blood pressure (hypotension)
- Sweating
- Pale skin
- Cold hands or feet
- Urinating less than normal or not at all

2. Nursing Management

Fluids and plasma, given through an IV, and **medications** to treat cardiogenic shock, work to increase your heart's pumping ability. Inotropic agents. You might be given **medications** to improve your heart function, such as norepinephrine (Levophed) or dopamine, until other treatments start to work. Aspirin.

1. Provide supplemental oxygen as ordered. If the patient develops respiratory distress, be prepared for intubation and mechanical ventilation.
2. Administer low-dose morphine sulfate as ordered to reduce preload in an attempt to decrease pulmonary congestion.
3. Minimize oxygen demand by maintaining bed rest and decreasing anxiety, fever, and pain.
4. Position the patient for maximum chest excursion and comfort.
5. Administer diuretics and /or vasodilators as ordered to reduce circulating volume and decrease preload.

b. Hypovolemic
    1. s/s

anxiety
GI Bleeding
Ectopic Pregnancy

blue lips and fingernails
low or no urine output
profuse sweating
shallow breathing
dizziness
confusion
chest pain
loss of consciousness
low blood pressure
rapid heart rate
weak pulse

3. Nursing Management
   Check for patent airway and adequate circulation.
   Begin an I.V. infusion with normal saline solution or lactated Ringer's solution delivered through a large bore.
   Help insert a central venous line and pulmonary artery catheter for hemodynamic monitoring.
   Insert an indwelling urinary catheter.
   Draw an arterial blood sample to measure ABG levels.
   Obtain and record the patient's blood pressure, pulse and respiratory rates, and peripheral pulse rates.
   Monitor the patient's CVP, right arterial pressure, pulmonary artery pressure, and cardiac output atleast hourly as ordered.
   Measure the patient's urine output hourly.
   Monitor the patient's ABG and electrolyte levels frequently as ordered.
   Watch for signs of impending coagulopathy such as petechiae, bruising, bleeding or oozing from guns or venipuncture site.
   Explain all procedures and their purposes to ease the patient's anxiety.
   Discuss the risk associated with blood transfusions to the patient and his family.

c. Distributive
   1. Neurogenic
      a. s/s

Cardiovascular: SBP < 90 or 30 mm Hg below baseline, Bradycardia.
Skin: .Warm, dry flushed skin
GI: Paralytic ileus.
Neurologic: Flaccid paralysis below level of lesion, Loss of reflex activity, Loss of bowel and bladder function.
Temperature: Hypothermia, Poikitothermia.
**bradycardia**
Dry, warm skin

c. Nursing Management

**Nursing Care Planning & Goals**

The major goals for the patient include:

- Maintain adequate ventilation as evidenced by absence of respiratory distress and ABGs within acceptable limits
- Demonstrate appropriate behaviors to support the respiratory effort.
- Maintain proper alignment of spine without further spinal cord damage.
- Maintain position of function as evidenced by absence of contractures, foot drop.
- Increase strength of unaffected/compensatory body parts.
- Demonstrate techniques/behaviors that enable resumption of activity.
- Recognize sensory impairments.
- Identify behaviors to compensate for deficits.
- Verbalize awareness of sensory needs and potential for deprivation/overload.

**Nursing Interventions**

Nursing interventions are directed towards supporting cardiovascular and neurologic function until the usually transient episode of neurogenic shock resolves.

- **Elevate head of bed.** Elevation of the head helps prevent the spread of the anesthetic agent up the spinal cord when a patient receives spinal or epidural anesthesia.
- **Lower extremity interventions.** Applying **anti-embolism stockings** and elevating the foot of the bed may help minimize pooling of the blood in the legs and prevent thrombus formation.
- **Exercise. Passive range of motion** of the immobile extremities helps promote circulation.
- **Airway patency.** Maintain patent airway: keep head in neutral position, elevate head of bed slightly if tolerated, use airway adjuncts as indicated.
- **Oxygen.** Administer oxygen by appropriate method (nasal prongs, mask, intubation, ventilator).
- **Activities.** Plan activities to provide uninterrupted rest periods and encourage involvement within individual tolerance and ability.
- **BP monitoring.** Measure and monitor BP before and after activity in acute phases or until stable.
- **Reduce anxiety.** Assist patient to recognize and compensate for alterations in sensation

2. Anaphylactic (allergen)

a. s/s

Cardiovascular: Chest pain, Third spacing of fluids, Angioedema which is swelling of face and mucus membranes of mouth and upper airway, Edema of Eyes, lips, tongue, hands, feet, genitalia.
Pulmonary: Wheezing, Rhinitis, Stridor, Edema of larynx and epiglottis, Shortness of breath.
Neurological: Anxiety, Feeling of Impending Doom, Confusion,
Decreased LOC.
GI: Metallic taste, Cramping, N/V (from vasodilation and hypoxia), diarrhea, May complain of "lump" in throat.
Skin: Flushing, pruritus, uticaria.

c. Nursing Management

Maintain airway!!
Intubate, crich, trach, etc!!!
Counteract the effects of anaphylaxi

• **Priority**- Assess respiratory function & establish/maintain a patent airway
• Administer O2 as indicated (monitor pulse ox & ABGs)
• Administer Epinephrine as ordered
• Administer antihistamines as ordered
• Administer inhaled beta-adrenergic agents as ordered for bronchospasms
• Administer corticosteroids as ordered to prevent reoccurrence of manifestations
• Observe for reoccurrence of manifestations (biphasic reaction) or complications of treatment
Epinephrine!
• Vasoconstricts to increase HR, increase CO and maintain BP/MAP

3. Septic

a. s/s

- Cool, pale arms and legs
- High or very low temperature, chills
- Lightheadedness
- Little or no urine
- Low blood pressure, especially when standing
- Palpitations
- Rapid heart rate
- Restlessness, agitation, lethargy, or confusion
- Shortness of breath
- Skin rash or discoloration
- Decreased mental status

b. Nursing Management

- **Infection control**. All invasive procedures must be carried out with **aseptic technique** after careful hand hygiene.
- **Collaboration**. The nurse must collaborate with the other members of the healthcare team to identify the site and source of sepsis and specific organisms involved.
- **Management of fever**. The nurse must monitor the patient closely for shivering.
- **Pharmacologic therapy**. The nurse should administer prescribed IV fluids and medications including antibiotic agents and vasoactive medications.
- **Monitor blood levels**. The nurse must monitor antibiotic toxicity, BUN, creatinine, WBC, hemoglobin, hematocrit, platelet levels, and coagulation studies.
- **Assess physiologic status**. The nurse should assess the patient's hemodynamic status, fluid intake and output, and nutritional status.

r. Obstructive (cardiac)
a. s/s

- Result of decrease cardiac output and BP with decreased tissue perfusion and cellular metabolism

-↓ BP
-↓ Preload
-Tachypnea → bradypnea (late)
-Shortness of breath
↓ Urine output
-Pallor
-cool, clammy
-↓ Cerebral perfusion:
• Anxiety
• Confusion
• Agitation
-Paralytic ileus
-↓ to absent bowel sounds

c. Nursing Management
d. REMOVE OBSTRUCTION
e. • Maintain patent airway
• Provide supplemental O2
• Intubation and mechanical ventilation, if necessary
• Restore circulation by treating cause of obstruction
• Fluid resuscitation may provide temporary improvement in CO and BP
• No specific drug therapy
• Treat cause of obstruction (e.g., pericardiocentesis for cardiac tamponade, needle decompression or chest tube insertion for tension pneumothorax, embolectomy for pulmonary embolism)

14**. Compensatory Mechanism in Shock**

a. S/S

Oriented to person, time, and place
BP normal or slightly low
Pulse elevaed
Urinary output 35-50 ml/hour
Capillary refill 3-5 seconds
Blood pH normal

b. Nursing Management

15. **Progressive/decompensated Stage of Shock**

Stage of shock in which the compensatory mechanisms are starting to fail, causing tissue ischemia

S+S
Decreased LOC
Hypotension
Weak, thready pulse
Diminished bowel sounds
Pulmonary/peripheral edema
Capillary refill 5-10 seconds
Reduced urinary output
Acidemia

Effects of cells going into anaerobic metabolism: Muliple organ failure
Metabolic acidosis

16. **Irreversible Stage**

Comatose
Severe hypotension
Diastolic BP undetectable
Pulse very weak or undetectable
Anuria
Capillary refill >10 seconds
Blood pH 7.0-7.2

17. **Tissue Perfusion:** damage cellular function

18**. Vasoactive Agents Used in Shock**

Norepinephrine, dopamine, epinephrine, phenylephrine, vasopressin, dobutamine, milirinone

19**. SIRS (systemic inflammatory response) from sepsis**

**Cause:** infections, trauma, burns, pancreatitis

a. s/s

- temperature > 38 or < 36
  heart rate > 90 beats/minute
  respiration rate > 20 beats/minute
  WBC >12,000 (leukocytosis), <4,000 (leukopenia), >10% immatures (left shift)
  -In neutropenic or immunosuppressed patient, the signs and symtpoms of SIRS may be absent

c. Nursing Management

Nursing interventions pertaining to sepsis should be done timely and appropriately to maximize its effectivity.

- **Infection control**. All invasive procedures must be carried out with **aseptic technique** after careful hand hygiene.
- **Collaboration**. The nurse must collaborate with the other members of the healthcare team to identify the site and source of sepsis and specific organisms involved.
- **Management of fever**. The nurse must monitor the patient closely for shivering.
- **Pharmacologic therapy**. The nurse should administer prescribed IV fluids and medications including antibiotic agents and vasoactive medications.
- **Monitor blood levels**. The nurse must monitor antibiotic toxicity, BUN, creatinine, WBC, hemoglobin, hematocrit, platelet levels, and coagulation studies.
- **Assess physiologic status**. The nurse should assess the patient's hemodynamic status, fluid intake and output, and nutritional status.

20**. MODS multiple organ failure**

a. s/s

| **Body System** | **Manifestations** |
|---|---|
| Respiratory | • Severe dyspnea, tachypnea<br>• PaO2/FiO2 ration <200<br>• Bilateral fluffy infiltrates on CXR<br>• V/Q mismatch<br>• Refractory hypoxemia |
| Cardiovascular | • Myocardial depression<br>• Massive vasodilation<br>• Decrease SVR, BP, MAP<br>• Increase HR<br>• Biventricular failure |
| Central Nervous System | • Acute change in neurologic status → confusion, disorientation, delir<br>• Fever<br>• Seizures<br>• Failure to wean, prolonged rehabilitation |

| | |
|---|---|
| Endocrine System | • Hyperglycemia |
| Renal System | Pre-renal:<br>• BUN/Cr rate >20:1<br>Intrarenal:<br>• BUN/Cr <10:1 |
| Gastrointestinal System | • Hypoperfusion → decrease peristalsis, paralytic ileus<br>• GI bleeding |
| Hepatic System | • Bilirubin >2, increased LFTs<br>• Hepatic encephalopathy |
| Hematologic System | • Coagulopathy (increased PT & PTT, decreased platelet count)<br>• Increased d-dimer |

c. Nursing Management

- General plan of nursing care for patients with MODS is the same as that for patients with septic shock
- Primary nursing interventions are aimed at supporting the patient and monitoring organ perfusion until primary organ insults are halted
- Providing information and support to family members is a critical role of the nurse → health care team must address end-of-life decisions to ensure that supportive therapies are congruent with the patient's wishes
- Patients who survive MODS must be informed about the goals of rehabilitation and expectations for progress toward these goals, because massive loss of skeletal muscle mass makes rehabilitation a long, slow process