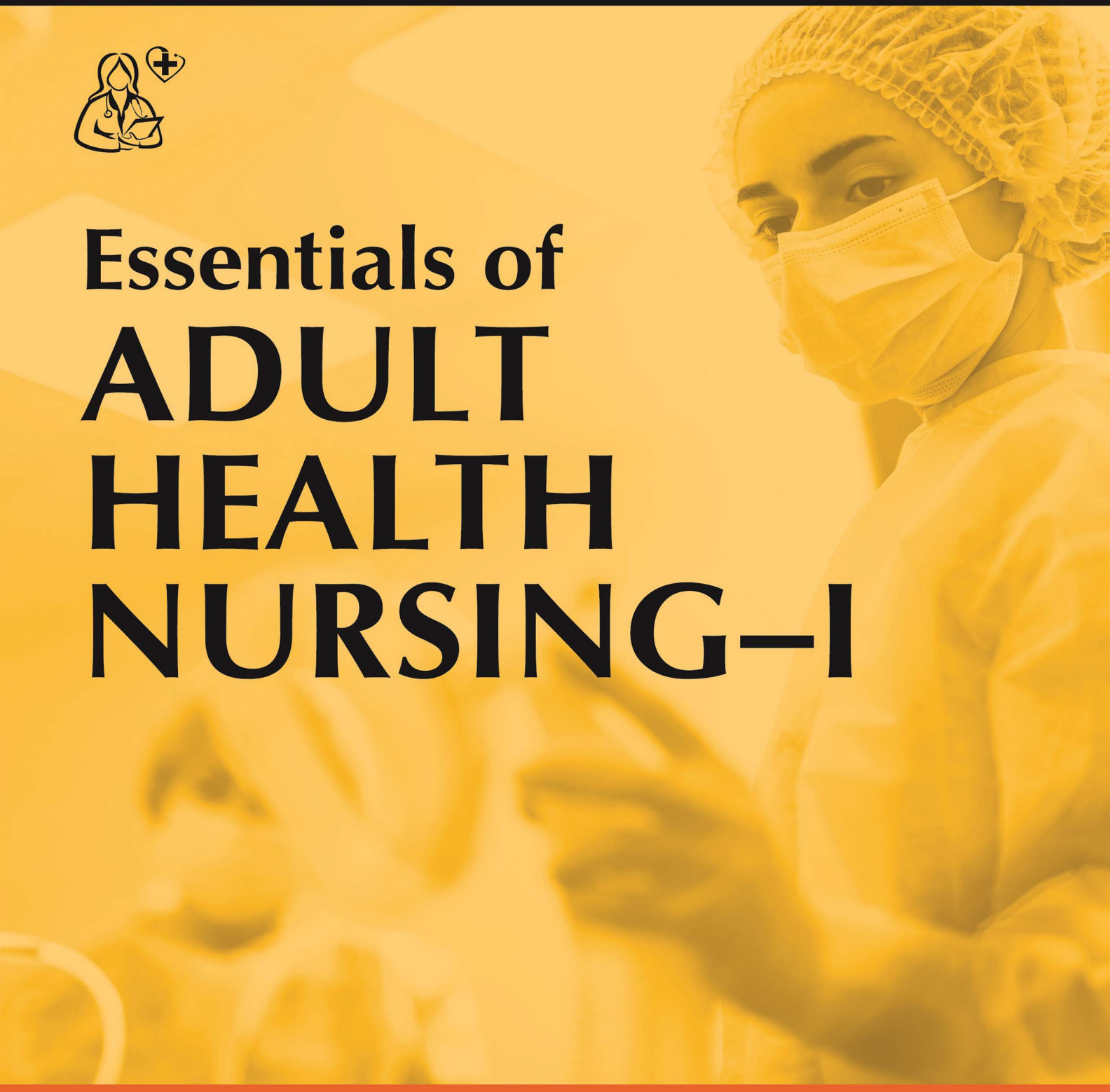

Essentials of ADULT HEALTH NURSING–I

As per the Revised BSc Nursing Syllabus

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JAYPEE

Contents

UNIT

3

Nursing Management of Patient with Common Signs and Symptoms

LEARNING OBJECTIVES

At the end of this unit, the students will be able to learn about:

- Fluid and electrolyte imbalance
- Vomiting
- Dyspnea and cough, respiratory
- Fever
- Shock
- Unconsciousness, syncope
- Pain
- Incontinence
- Edema

KEY TERMS

- **Anaphylactic shock** is a type of severe hypersensitivity or allergic reaction. Causes include allergy to insect stings, medicines, or foods (nuts, berries, seafood), etc.
- **Cardiogenic shock** happens when the heart is damaged and unable to supply sufficient blood to the body. This can be the end result of a heart attack or congestive heart failure.
- **Hypovolemic shock** is caused by severe blood and fluid loss, such as from traumatic bodily injury, which makes the heart unable to pump enough blood to the body, or severe anemia where there is not enough blood to carry oxygen through the body.
- **Neurogenic shock** is caused by spinal cord injury, usually as a result of a traumatic accident or injury.
- **Urge incontinence:** This type of incontinence is characterized by an intense need to urinate right away.
- **Mixed incontinence:** This type of incontinence is a combination of several problems that all lead to leakage issues.

FLUID AND ELECTROLYTE IMBALANCES

NORMAL SERUM ELECTROLYTE VALUES

Electrolyte	*Normal value*
Sodium (Na^+)	135–145 mEq/L
Potassium (K^+)	3.5–5.0 mEq/L
Calcium (Ca^{2+})	9.0–10.5 mg/dL
Ionized calcium (Ca^{2+})	4.5–5.3 mg/dL
Magnesium (Mg^{2+})	1.3–2.1 mg/dL
Chloride (Cl^-)	98–106 mEq/L

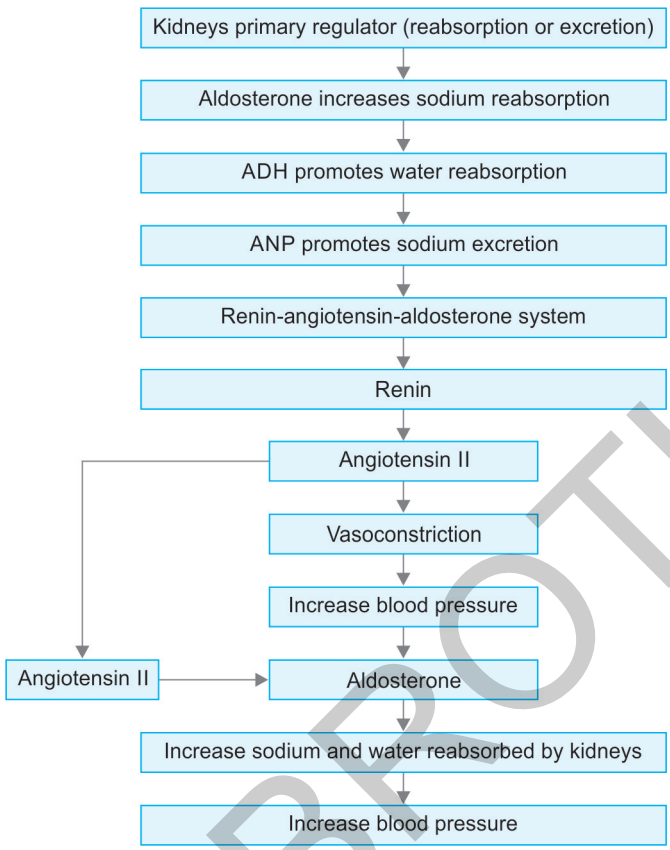
SODIUM

Sodium is a major cation of extracellular fluid. The serum sodium level is maintained by sodium-potassium pump. The normal serum sodium level is 135–145 mEq/L any change in this value will results hyponatremia or hypernatremia. The major function of sodium is to transmit the impulse in nerve and muscle fibers and to maintain acid-base balance.

Mechanism of Sodium Regulation (Flowchart 3.1)

Excessive heat and humid environment results in excessive sweating. Kidney regulates the sodium excretion and absorption. As the changes occur outside the body like temperature, aldosterone increase the absorption of sodium and antidiuretic hormone increases the

Flowchart 3.1: Mechanism of sodium regulation.



reabsorption of water. At same time Renin-Angiotensin-Aldosterone system causes vasoconstriction and there will increase in blood pressure.

Medications Affecting Sodium Levels

Drug decrease the sodium level	• Hypotonic IV solutions (D5W, 0.45% NS) • Thiazide diuretics • Loop diuretics • Oxytocin
Drug increase the sodium level	• Hypertonic saline solutions (3% NaCl) • Corticosteroids • Sodium bicarbonate

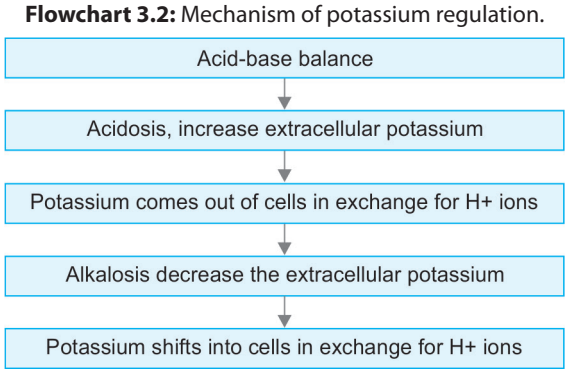
POTASSIUM

Potassium is a major cation intracellular fluid. The normal range of serum potassium is 3.5–5.0 mEq/L. The major functions of potassium is to maintains intracellular osmolarity, electroneutrality, cardiac, skeletal, and smooth muscle contraction, nerve impulse conduction, acid-base balance, metabolism of carbohydrates and proteins. Potassium level is regulated by sodium-potassium pump.

Mechanism of Potassium Regulation (Flowchart 3.2)

Due to any condition which results in fall in blood Ph, like acidosis state that results in increase in serum potassium level. Extra potassium goes out from the cell to counterbalance the level. In case of alkalosis, there is decrease in the extracellular potassium and potassium shifts into the cell to exchange hydroxyl ions.

Flowchart 3.2: Mechanism of potassium regulation.



Medications Affecting Potassium Levels

Drug decrease the potassium level	• Loop and thiazide diuretics • Laxatives • Corticosteroids • Insulin
Drug increase the potassium level	• Potassium chloride • Angiotensin converting enzyme (ACE) inhibitors • Potassium-sparing diuretics • Heparin

CALCIUM

Calcium is an essential mineral which is absorbed through GI tract. The normal serum calcium level is 9.0–10.5 mg/dL. Its major functions are formation, maintenance of teeth and bones, nerve impulse transmission, cardiac and skeletal muscle contraction and blood clotting.

Calcium is present in serum in two forms:

- **Bound calcium:** It is present in albumin and helps in blood coagulation.
- **Ionized or unbound:** It covers 50% of serum calcium and helps in nerve impulses transmission and responsible for normal heart function.

Mechanism of Calcium Regulation

- Sunlight exposure and vitamin D increase the serum calcium level.
- Parathyroid hormone increases the serum calcium level.
- Calcitonin (from thyroid gland) decreases the serum calcium level.

Medications Affecting Calcium Level

Drug decrease the calcium level	• Loop diuretics • Citrate-buffered blood • Bisphosphonates • Oral phosphate supplements • Magnesium antacids, laxatives • Corticosteroids, calcitonin, chelating agents
Drug increase the calcium level	• Calcium supplements • Antacids with calcium carbonate • Vitamin D • Parathyroid hormone • Lithium • Thiazide diuretics

MAGNESIUM

It is the second most abundant intracellular fluid cation. The normal serum magnesium (Mg^{2+}) level is 1.3–2.1 mg/dL. It is helpful in most of the metabolic processes, especially energy metabolism. Its major functions are to do enzymatic activity, bone formation, energy metabolism, sedative effect on neuromuscular transmissions, having antiarrhythmic properties and smooth muscle relaxation.

Medications Affecting Magnesium Level

Drug decrease the magnesium level	• Loop diuretics • Aminoglycosides antibiotics • Corticosteroids • Calcium gluconate
Drug increases the magnesium level	• Antacids • Laxatives • Magnesium sulfate

PHOSPHATE (PO_4^{3-})

It is a major intracellular fluid anion, located in bones and helps in bone formation and cellular energy metabolism. Its major functions are to provide strength to bone and teeth, energy storage and transport, maintaining membrane structure and acid-base balance. Parathyroid hormone lowers the phosphate by increasing renal excretion and vitamin D raises the phosphate level.

Medications Affecting Phosphate Level

Drug decrease the phosphate level	• Sucralfate • Phosphate binders • Aluminum antacids • Calcium antacids • Diuretics
Drug increase phosphate level	• Bisphosphonates • Oral phosphate supplements • IV phosphates • Phosphate enema • Excessive vitamin D

VOMITING

Nausea and vomiting often considered more of an unpleasant inconvenience than a medical problem, can be debilitating and can cause prolonged recovery times and increased costs. In critically ill patients, severe or protracted nausea and vomiting can lead to serious complications, which can be life-threatening.

Nausea and vomiting are basic human protective reflexes against the absorption of toxins, as well as responses to certain stimuli. The terms nausea and vomiting are often used together, although each phenomenon should be assessed separately. Nausea is defined as a subjectively unpleasant wavelike sensation in the back of the throat or epigastrium associated with pallor or flushing, tachycardia,

Intravenous Fluid Comparison

Type	Solution	Uses	Special considerations
Isotonic	Dextrose 5% in water (D5W)	• Fluid loss • Dehydration • Hypernatremia	• Use cautiously in renal and cardiac patients • Can cause fluid overload
Isotonic	0.9% sodium chloride (normal saline) (NaCl)	• Shock • Hyponatremia • Blood transfusions • Resuscitation • Fluid challenges • DKA	• Can lead to overload • Use with caution in patients with heart failure or edema
Isotonic	Lactated Ringer's (LR)	• Dehydration • Burns • Lower GI fluid loss • Acute blood loss • Hypovolemia due to third spacing	• Contains potassium, don't use with renal failure patients • Don't use with liver disease, can't metabolize lactate
Hypotonic	0.45% sodium chloride (1/2 normal saline)	• Water replacement • DKA • Gastric fluid loss from NG or vomiting	• Use with caution • May cause cardiovascular collapse or increased intracranial pressure • Don't use with liver disease, trauma, or burns
Hypertonic	Dextrose 5% in 1/2 normal saline	• Later in DKA treatment	• Use only when blood sugar falls below 250 mg/dL
Hypertonic	Dextrose 5% in normal saline	• Temporary treatment for shock if plasma expanders aren't available • Addison's crisis	• Don't use in cardiac or renal patients
Hypertonic	Dextrose 10% in water	• Water replacement • Conditions where some nutrition with glucose is required	• Monitor blood sugar levels

and an awareness of the urge to vomit. Sweating, excess salivation, and a sensation of being cold or hot may occur. Vomiting, or emesis, is characterized by contraction of the abdominal muscles, descent of the diaphragm, and opening of the gastric cardia, resulting in forceful expulsion of stomach contents from the mouth.

ETIOLOGY

- Radiotherapy
- Chemotherapy
- Pregnancy
- Postoperative
- Motion sickness
- Drug induced
- Anxiety
- Bulimia nervosa
- Cough
- Fluid and electrolyte imbalance
- Food poisoning
- Gastrointestinal obstruction
- Increased intracranial pressure
- Infections
- Metastasis
- Peritonitis
- Tube feeding
- Uremia
- Vestibular problems

MANAGEMENT

Class	Example
Antihistamines	*Cyclizine, Promethazine*
Antimuscarinic drugs	*Hyoscine*
Dopamine receptor antagonists	*Prochlorperazine, Metoclopramide, Domperidone*
$5HT_3$ receptor antagonists	*Granisetron, Ondansetron*
Neurokinin receptor antagonists	*Aprepitant*
Cannabinoids	*Nabilone*
Corticosteroids (weak antiemetic)	*Dexamethasone, Methylprednisolone*
Benzodiazepines (no intrinsic antiemetic activity)	*Lorazepam*

Nonpharmacological Management

- Positioning the patient upright while eating and for one hour post-meal.
- Offer dry foods throughout the day.
- Encourage bland, soft, easily-digestible food for main meals.
- Rinsing patient's mouth after eating.

DYSPNEA

- **Dyspnea** refers to the sensation of difficult or uncomfortable breathing. It is a subjective experience perceived and reported by an affected patient. Dyspnea on exertion may occur normally, but is considered indicative of disease when it occurs at a level of activity that is usually well tolerated.
- **Orthopnea** is the sensation of breathlessness in the recumbent position, relieved by sitting or standing.
- **Paroxysmal nocturnal dyspnea (PND)** is a sensation of shortness of breath that awakens the patient, often after 1 or 2 hours of sleep, and is usually relieved in the upright position.

MANAGEMENT

Pharmacological Management

- **Beta2-adrenergic agonists:** Metaproterenol, Albuterol, Terbutaline
- **Methylxanthines:** Theophylline
- **Muscarinic receptor antagonists:** Ipratropium bromide
- **Adrenal corticosteroids:** Beclomethasone, Flunisolide, Triamcinolone
- Cromolyn sodium
- **Leukotriene inhibitors:** Zafirlukast, Montelukast sodium
- **Monoclonal antibodies:** Omalizumab

Nursing Management

- **Monitor respiratory rate, ease of breathing, and depth of respiration:** The average rate of respiration for adults is 10 to 20 breaths per minute. It is important to take action when respirations exceed 30 breaths per minute.
- **Ask if they are "short of breath" and note any dyspnea:** Sometimes anxiety can cause dyspnea, so watch the patient for "air hunger" which is a sign that the cause of shortness of breath is physical.
- **Check for hyperventilation:** Check for "sighing" with breathing.
- **Look for accessory muscle use:** True respiratory issues that are physiological cause the use of accessory muscles to help get air flow into the body.
- **Look at skin color:** Lack of oxygen will cause cyanosis coloring to the lips, tongue, and fingers. Cyanosis to the inside of the mouth is a medical emergency.
- **Listen to breath sounds:** Listen to breath sounds. Check for crackles, wheezing, lack of breath sounds, and any other lung sounds.
- **Check pulse oximetry:** Check the patient's oxygen saturation levels up on first assessment and on a regular basis with any respiratory conditions. Normal oxygen saturation levels are between 95% and 100%.
- Provide respiratory medications and oxygen, per doctor's orders.
- **Monitor vital signs, respiratory status, and pulse oximetry:** Frequent monitoring of vital signs, oxygen saturation, and respiratory efforts can alert the nurse and doctor to a change in condition.
- Assist patient to breathe slowly and stay calm.
- Teach patient to use "pursed lip breathing."
- For acute dyspnea, sit patient straight up to assist with lung opening.
- Ambulate patient as tolerated with doctor's order three times daily.
- Encourage frequent rest periods and teach patient to pace activity.
- Consult dietician for dietary modifications.
- Encourage small frequent meals to prevent crowding of the diaphragm.
- Place a fan in the room.
- Encourage the patient to "Turn, cough and deep breath" every 2 hours.
- Use chest and back percussions to help break up mucous with doctor's order.

FEVER

Hyperthermia occurs when the body absorbs heat more than it can release. Excessively elevated body temperatures are considered medical emergency as it may life-threatening that can cause permanent disability and even death. Fever is one of the most common medical signs and is characterized by an elevation of body temperature above the normal range of 36.5–37.5 °C (97.7–99.5°F) due to an increase in the temperature regulatory set-point.

NURSING MANAGEMENT

Nursing Management of Hyperthermia

- Monitor temperature at least every 2 hours.
- Monitors in continuous basal temperature.
- Monitor blood pressure, pulse, and respiration.
- Monitor skin color and temperature.
- Monitor level of consciousness.

- Monitor WBC, Hb, Hct.
- Monitor intake and output.
- Give antipyretic.
- Provide treatment to overcome the cause of fever.
- Provide intravenous fluids.
- Compress the patient, on the thigh fold, axilla and neck.
- Increase air circulation.
- Provide treatment to prevent shivering.
- Monitor signs of hyperthermia.
- Increase fluid intake and nutrition.
- Teach the patient how to prevent fatigue due to heat.
- Discuss and clarify the importance of temperature regulation and possible negative effects of cold.
- Provide appropriate antipyretic medication as needed.
- Use the mattress cool and warm water bath to overcome the interference fit the needs of the body temperature.
- Release of excess clothing and covered the patient with only a piece of clothing.

SHOCK

Clinical syndrome characterized by decreased tissue perfusion and impaired cellular metabolism resulting in an imbalance between the supply and demand for oxygen and nutrients.

ETIOLOGY AND PATHOPHYSIOLOGY

Cardiogenic Shock

Cardiogenic shock occurs when either systolic or diastolic dysfunction of the pumping action of the heart results in compromised cardiac output (CO).

- Precipitating causes of cardiogenic shock include myocardial infarction (MI), cardiomyopathy, blunt cardiac injury, severe systemic or pulmonary hypertension, cardiac tamponade, and myocardial depression from metabolic problems.
- Hemodynamic profile will demonstrate an increase in the pulmonary artery wedge pressure (PAWP) and pulmonary vascular resistance.
- **Sign and symptoms:** Tachycardia, hypotension, a narrowed pulse pressure, tachypnea, pulmonary congestion, cyanosis, pallor, cool and clammy skin, decreased capillary refill time, anxiety, confusion, and agitation.

Hypovolemic Shock

Hypovolemic shock occurs when there is a loss of intravascular fluid volume.

Types of Hypovolemic Shock

a. **Absolute hypovolemia** results when fluid is lost through hemorrhage, gastrointestinal (GI) loss (e.g., vomiting, diarrhea), fistula drainage, diabetes insipidus, hyperglycemia, or diuresis.
b. **Relative hypovolemia** results when fluid volume moves out of the vascular space into extravascular space (e.g., interstitial or intracavitary space) and this is called *third spacing*.
c. The physiologic consequences of hypovolemia include a decrease in venous return, preload, stroke volume, and CO resulting in decreased tissue perfusion and impaired cellular metabolism.

Clinical manifestations depend on the extent of injury or insult, age, and general state of health and may include anxiety, an increase in heart rate, CO, and respiratory rate and depth, and a decrease in stroke volume, PAWP, and urine output.

Neurogenic Shock

- Neurogenic shock is a hemodynamic phenomenon that can occur within 30 minutes of a spinal cord injury at the fifth thoracic (T5) vertebra or above and last up to 6 weeks, or in response to spinal anesthesia.
- Clinical manifestations include hypotension, bradycardia, temperature dysregulation (resulting in heat loss), dry skin, and *poikilothermia* (taking on the temperature of the environment).

Anaphylactic Shock

Anaphylactic shock is an acute and life-threatening hypersensitivity (allergic) reaction to a sensitizing substance (e.g., drug, chemical, vaccine, food, insect venom).

- Immediate reaction causes massive vasodilation, release of vasoactive mediators, and an increase in capillary permeability resulting in fluid leaks from the vascular space into the interstitial space.
- Clinical manifestations can include anxiety, confusion, dizziness, chest pain, incontinence, swelling of the lips and tongue, wheezing, stridor, flushing, pruritus, urticaria, and angioedema.

Septic Shock

Septic shock is the presence of sepsis with hypotension despite fluid resuscitation along with the presence of tissue perfusion abnormalities. In severe sepsis and septic shock, the initiated body response to an antigen is exaggerated resulting in an increase in inflammation and coagulation, and a decrease in fibrinolysis. Endotoxins from the microorganism cell wall stimulate the release of cytokines and other proinflammatory mediators that act through secondary mediators such as platelet-activating factor. Clinical presentation for sepsis is complex. Patients will usually experience a hyperdynamic state characterized by increased CO. Persistence of a high CO beyond 24 hours

is ominous and often associated with hypotension and multiple organ dysfunction syndrome (MODS). Initially patients will hyperventilate as a compensatory mechanism, resulting in respiratory alkalosis followed by respiratory acidosis and respiratory failure. Other clinical signs include alteration in neurologic status, decreased urine output, and GI dysfunction.

STAGES OF SHOCK

1. **Compensatory stage:**
   - Decrease in circulating blood volume
   - Sympathetic nervous system stimulated, release catecholamines (epinephrine and norepinephrine), bronchodilation and increased cardiac output occurs. To maintain blood pressure: increase heart rate and contractility increases in peripheral vasoconstriction due to stimulation of beta adrenergic fibers (cause vasoconstriction of blood vessels of skin and abdominal viscera) and increase in heart rate and contractility.
   - Renin-angiotensin release of aldosterone-reabsorb H_2O and sodium, get fluid shift from interstitial to capillaries due to decrease in hydrostatic pressure in capillaries.
   - Shunting blood from the lungs-ventilation-perfusion mismatch.
   - Circulation maintained, but only sustained short time without harm to tissues.
2. **Progressive stage:**
   - Altered capillary permeability (3rd spacing)
   - In the lungs: alveolar or pulmonary edema, ARDS, increased pulmonary artery pressures
   - Cardiac output decreases and coronary perfusion is decreased. Decreased myocardial perfusion-arrhythmias and myocardial ischemia.
   - Kidneys: Elevated BUN and creatinine.
   - Metabolic acidosis, anaerobic metabolism and kidneys can't excrete acids and reabsorb bicarbonate
   - GI—ischemia causes ulcers and GI bleed.
   - Liver—can't eliminate waste products, elevated ammonia and lactate, bilirubin (jaundice) bacteria released in bloodstream.
   - Hematologic: Disseminated intravascular coagulopathy (DIC).
3. **Refractory stage:**
   - Anaerobic metabolism starts, lactic acid build-up.
   - Increased capillary blood leak, worsens hypotension and tachycardia, also get cerebral ischemia.
   - Get profound hypotension and hypoxemia.
   - Cellular death leads, tissue death, vital organs fail and death occurs (lungs, liver and kidneys result in accumulation of waste products. One organ failure leads to another.
   - Recovery unlikely.

DIAGNOSTIC EVALUATION

- **Blood:** RBC, hemoglobin and hematocrit
- **Arterial blood gases:** Respiratory alkalosis and metabolic acidosis
- Electrolytes (Na level increased early, decreased later if hypotonic fluid given) K decrease later increase K with cellular breakdown and renal failure
- BUN and creatinine increased, specific gravity increased then fixed at 1.010
- **Blood cultures:** Identify causative organism in septic shock
- **Cardiac enzymes:** Diagnosis of cardiogenic shock
- **Glucose:** Increased early then decreased
- **DIC screen:** Fibrinogen level, platelet count, PTT and PT, thrombin time.
- **Lactic acid:** Increased
- Liver enzymes, ALT, AST and GGT increased

MANAGEMENT

- General management strategies for a patient in shock begin with ensuring that the patient has a patent airway and oxygen delivery is optimized. The cornerstone of therapy for septic, hypovolemic, and anaphylactic shock is volume expansion with the administration of the appropriate fluid.
- It is generally accepted that isotonic crystalloids, such as normal saline, are used in the initial resuscitation of shock. If the patient does not respond to 2 to 3 L of crystalloids, blood administration and central venous monitoring may be instituted.
- The primary goal of drug therapy for shock is the correction of decreased tissue perfusion.
- Sympathomimetic drugs cause peripheral vasoconstriction and are referred to as vasopressor drugs (e.g., epinephrine, norepinephrine).
- The goals of vasopressor therapy are to achieve and maintain a mean arterial pressure (MAP) of 60 to 65 mm Hg and the use of these drugs is reserved for patients unresponsive to other therapies.
- The goal of vasodilator therapy, as in vasopressor therapy, is to maintain mean arterial pressure at 60 to 65 mm Hg or greater.
- Vasodilator agents most often used are nitroglycerin (in cardiogenic shock) and nitroprusside.

COLLABORATIVE CARE

Cardiogenic Shock

- Overall goal is to restore blood flow to the myocardium by restoring the balance between oxygen supply and demand.
- Definitive measures include thrombolytic therapy, angioplasty with stenting, emergency revascularization, and valve replacement.

- Care involves hemodynamic monitoring, drug therapy (e.g., diuretics to reduce preload), and use of circulatory assist devices (e.g., intra-aortic balloon pump, ventricular assist device).

Hypovolemic Shock

- The underlying principles of managing patients with hypovolemic shock focus on stopping the loss of fluid and restoring the circulating volume.
- Fluid replacement is calculated using a 3:1 rule (3 mL of isotonic crystalloid for every 1 mL of estimated blood loss).

Septic Shock

- Patients in septic shock require large amounts of fluid replacement, sometimes as much as 6 to 10 L of isotonic crystalloids and 2 to 4 L of colloids, to restore perfusion.
- Vasopressor drug therapy may be added and vasopressin may be given to patient's refractory to vasopressor therapy.
- Intravenous corticosteroids are recommended for patients who require vasopressor therapy, despite fluid resuscitation, to maintain adequate BP.
- Antibiotics are early component of therapy and are started after obtaining cultures.
- Drotrecogin alfa, a recombinant form of activated protein C, has demonstrated promise in treating patients with severe sepsis.
- Glucose levels should be maintained at less than 150 mg/dL.
- Stress ulcer prophylaxis with histamine (H_2)-receptor blockers and deep vein thrombosis prophylaxis with low dose unfractionated heparin or low molecular weight heparin are recommended.

Neurogenic Shock

- Treatment of neurogenic shock is dependent on the cause.
- In spinal cord injury, general measures to promote spinal stability are initially used.
- Definitive treatment of the hypotension and bradycardia involves the use of vasopressor and atropine respectively.
- Fluids are administered cautiously as the cause of the hypotension is generally not related to fluid loss.
- The patient is monitored for hypothermia.

Anaphylactic Shock

- Epinephrine is the drug of choice to treat anaphylactic shock.
- Diphenhydramine is administered to block the massive release of histamine.
- Endotracheal intubation or cricothyroidotomy may be necessary.
- Aggressive fluid replacement, predominantly with colloids, is necessary.
- Intravenous corticosteroids may be helpful in anaphylactic shock if significant hypotension persists after 1 to 2 hours of aggressive therapy.

NURSING MANAGEMENT

Acute intervention: The role of the nurse in shock involves:

- Monitoring the patient's ongoing physical and emotional status to detect subtle changes in the patient's condition.
- Planning and implementing nursing interventions and therapy.
- Evaluating the patient's response to therapy.
- Providing emotional support to the patient and family.
- Collaborating with other members of the health team when warranted by the patient's condition.
- Neurologic status, including orientation and level of consciousness, should be assessed every hour or more often.
- Heart rate, rhythm, BP, central venous pressure, and PA pressures including continuous cardiac output should be assessed at least every 15 minutes.
- The patient's ECG should be continuously monitored to detect dysrhythmias that may result from the cardiovascular and metabolic derangements associated with shock. Heart sounds should be assessed for the presence of an S_3 or S_4 sound or new murmurs. The presence of an S_3 sound in an adult usually indicates heart failure.
- The respiratory status of the patient in shock must be frequently assessed to ensure adequate oxygenation, detect complications early, and provide data regarding the patient's acid-base status.
- Pulse oximetry is used to continuously monitor oxygen saturation.
- Arterial blood gases (ABGs) provide definitive information on ventilation and oxygenation status, and acid-base balance.
- Most patients in shock will be intubated and on mechanical ventilation.
- Hourly urine output measurements assess the adequacy of renal perfusion and a urine output of less than 0.5 mL/kg/hour may indicate inadequate kidney perfusion.
- BUN and serum creatinine values are also used to assess renal function.
- Tympanic or pulmonary arterial temperatures should be obtained hourly if temperature is elevated or subnormal, otherwise every 4 hours.
- Capillary refill should be assessed and skin monitored for temperature, pallor, flushing, cyanosis, and diaphoresis.
- Bowel sounds should be auscultated at least every 4 hours, and abdominal distention should be assessed.

- If a nasogastric tube is inserted, drainage should be checked for occult blood as should stools.
- Oral care for the patient in shock is essential and passive range of motion should be performed three or four times per day.
- Anxiety, fear, and pain may aggravate respiratory distress and increase the release of catecholamines.
- The nurse should talk to the patient, even if the patient is intubated, sedated, and paralyzed or appears comatose. If the intubated patient is capable of writing, a pencil and paper should be provided.

UNCONSCIOUSNESS AND SYNCOPE

Loss of consciousness is apparent in patient who is not oriented, does not follow commands, or needs persistent stimuli to achieve a state of alertness. A person who is unconscious and unable to respond to the spoken words can often hear what is spoken. Unconsciousness is an abnormal state resulting from disturbance of sensory perception to the extent that the patient is not aware of what is happening around him.

LEVELS OF UNCONSCIOUSNESS

Alert	*Normal consciousness*
Automatism	Aware of surroundings, May be unable to remember actions later and Possible abnormal mood, may show defects of memory and judgment
Confuse	Loss of ability to speak and think in a logical coherent fashion, Responds to simple orders, May be disorientated for time and space
Delirium	Characterized by restlessness and possible violence, Not capable to rational thought, May be troublesome and not comply with simple orders
Stupor	Quite and uncommunicative, Remains conscious but sits or lies with a glazed expression, Does not respond to orders, Bladder and rectal incontinence occur, More serious than the previous wild stage
Semi-coma	A twilight stage, Patients often pass fitfully into unconsciousness, May be aroused to the stupor state by vigorous stimulation
Coma	Patient deeply unconscious, Cannot be roused and does not wake up with vigorous stimulation

ETIOLOGY

- Head injury
- Skull fracture
- Asphyxia
- Fainting
- Extremes of body temperature
- Cardiac arrest
- Blood loss
- Cerebrovascular accident
- Epilepsy
- Infantile convulsions
- Hypoglycemia
- Hyperglycemia
- Drug overdose
- Hypothermia
- Poisonous substances and fumes

MANAGEMENT

Assessment of Unconscious Patients

- History
- Physical assessment

Glasgow Coma Scale

Eye opening	Spontaneous-4 To speech-3 To pain-2 No response-1
Verbal response	Oriented-5 Confusion-4 Inappropriate words-3 Incomprehensible sounds-2 No response-1
Motor response	Obey commands-6 Localizes-5 Withdraws-4 Flexes-3 Extends-2 No response-1

Total score: 3–15

NURSING DIAGNOSIS

- Ineffective airway clearance related to altered level of consciousness.
- Risk for injury related to decreased level of consciousness.
- Risk for impaired skin integrity related to immobility.
- Impaired urinary elimination related to impairment in sensing and control.
- Disturbed sensory perception related to neurologic impairment.
- Interrupted family process related to health crisis.
- Risk for impaired nutritional status.

NURSING INTERVENTIONS

1. **Maintaining patent airway:**
   - Elevating the head end of the bed to 30° prevents aspiration
   - Positioning the patient in lateral or semi-prone position

- Suctioning
- Chest physiotherapy
- Auscultate in every 8 hours
- Endotracheal tube or tracheostomy

2. **Protecting the client:**
   - Padded side rails
   - Restrains
   - Take care to avoid any injury
   - Talk with the client in-between the procedures
   - Speak positively to enhance the self-esteem and confidence of the patient
3. **Maintaining fluid balance and managing nutritional needs:**
   - Assess the hydration status
   - More amount of liquid
   - Start IV line
   - Liquid diet
   - NG tube
4. **Maintaining skin integrity:**
   - Regular changing in position
   - Passive exercises
   - Back massage
   - Use splints or foam boots to prevent foot drop
   - Special beds to prevent pressure on bony prominences
5. **Preventing urinary retention:**
   - Palpate for a full bladder
   - Insert an indwelling catheter
   - Condom catheter for male and absorbent pads for females in case of incontinence
   - Inducing stimulation to urinate
6. **Providing sensory stimulation:**
   - Provided at proper time to avoid sensory deprivation
   - Efforts are made to maintain the sense of daily rhythm by keeping the usual day and night patterns for activity and sleep
   - Maintain the same schedule each day
   - Orient the client to the day, date, and time accordingly
   - Touch and talk
   - Proper communication
   - Always address the client by name, and explain the procedure each time
7. **Family needs:**
   - Family support
   - Educate the needs of client
   - Care to be provided

INCONTINENCE

Inability of usually continent person to reach toilet in time to avoid unintentional loss of urine is termed as incontinence. Urinary incontinence is an uncontrolled leakage of urine. The inability to hold urine in the bladder is either caused by the weakened or the lost of voluntary control over the urinary sphincter.

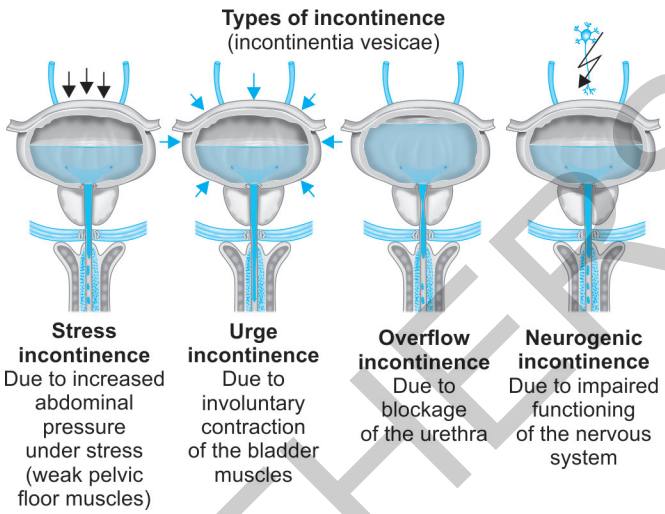


Fig. 3.1: Types of incontinence.

TYPES AND ETIOLOGY (FIG. 3.1)

- **Stress incontinence:** It occurs while lifting, exercising, laughing, sneezing and coughing which commonly occurs in women.
- **Urge incontinence:** It is defined as an oversensitive bladder causing the urge to urinate when sleeping, drinking or listening to running water.
- **Overflow incontinence:** It happen when the bladder is not completely emptied causing frequent dribbling urination.
- **Functional incontinence:** This condition is brought about by limitations in movement, thinking and communicating, thus the client often unable to control bladder before they reach the bathroom.
- **Mixed incontinence:** In this, two types of incontinence that occurs concurrently, usually stress incontinence and urge incontinence which is commonly found in women.
- **Anatomic or developmental abnormalities:** It is caused by anatomic or neurologic abnormalities.
- **Temporary incontinence:** It usually occurs from constipation, UTI or side-effect of treatment or medications.
- **Bed-wetting:** Nocturnal enuresis is common in children and normal until 5 years old. This condition is the result of delayed neurological control of the bladder.

MANAGEMENT

- Obtain a history of duration and severity of urine loss, previous method of management, and aggravating or alleviating features.
- Perform a focused physical assessment, including inspection of the perineal skin, examination of the vaginal vault, and reproduction of the sign of stress urinary incontinence.

- Complete a bladder log of urine elimination patterns and frequency and severity of urine loss.
- Assist the patient to select and apply a urine containment devices or devices.
- Evaluate disposable vs. reusable products for urine containment.
- Apply a protective barrier or ointment to the perineal skin when incontinence is severe, when double fecal and urinary incontinence exist.

EDEMA

Edema **(Fig. 3.2)** occurs when fluid builds up in the tissues, often in the feet, legs and ankles. Edema can affect anyone, especially people who are pregnant and adults age 65 and older. Treatment involves lifestyle changes, including diet and exercise.

TYPES

- **Peripheral edema:** This affects the feet, ankles, legs, hands, and arms.
- **Pulmonary edema:** This occurs when excess fluid collects in the lungs, making breathing difficult.
- **Cerebral edema:** This occurs in the brain.
- **Macular edema:** This is a serious complication of diabetic retinopathy.

CLINICAL MANIFESTATIONS

- Swollen, stretched, and shiny skin
- Skin that retains a dimple after a few seconds of pressure
- Puffiness of the ankles, face, or eyes
- Aching body parts and stiff joints
- Weight gain or weight loss

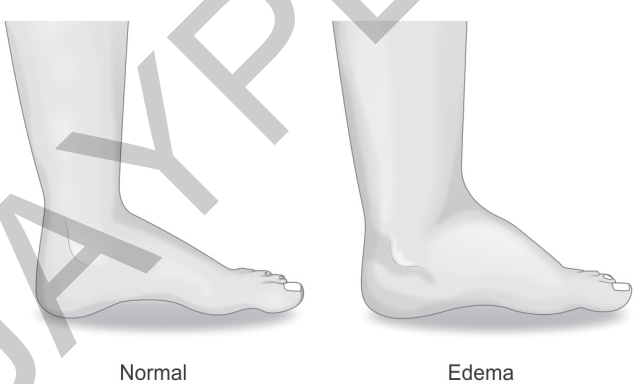


Fig. 3.2: Edema.

- Decreased urine production
- Fuller hand and neck veins
- Visual anomalies

TREATMENT

Diuretics are a type of medication. They help get rid of excess fluid by increasing the rate of urine production by the kidneys.

Summary

Sodium is a major cation of extracellular fluid that is maintained by sodium-potassium pump. Its major functions are to transmit impulse in nerve and muscle fibers, maintain acid-base balance, and regulate excretion and absorption. It is also regulated by sodium-potassium pump, which has a range of 3.5–5.0 mEq/L. Calcium is an essential mineral which is absorbed through GI tract and has major functions such as forming, maintaining teeth and bones, nerve impulse transmission, cardiac and skeletal muscle contraction and blood clotting. The magnesium level is 1.3–2.1 mg/dL and is helpful in most of the metabolic processes, especially energy metabolism.

Hydroxytocin is an important intracellular fluid anion located in bones and helps in bone formation and cellular energy metabolism. It provides strength to bone and teeth, energy storage and transport, maintaining membrane structure and acid-base balance. Parathyroid hormone lowers the phosphate by increasing renal excretion and vitamin D raises the phosphate level. Hyperthermia occurs when the body absorbs heat more than it can release, while fever is characterized by an elevation of body temperature above the normal range of 36.5–37.5 °C. Cardiogenic shock occurs when either systolic or diastolic dysfunction of the pumping action of the heart results in compromised cardiac output (CO).

Anaphylactic shock is an acute and life-threatening hypersensitivity to a sensitizing substance, while loss of consciousness is apparent in patients who are not oriented, does not follow commands, or needs persistent stimuli to achieve a state of alertness. Unconsciousness is an abnormal state resulting from disturbance of sensory perception to the extent that the patient is not aware of what is happening around him.

REVIEW QUESTIONS

1. Explain the types of fluid and electrolyte imbalance.
2. Write the nursing intervention for hyperthermia.
3. What are the various types of shock? Explain the nursing management of cardiogenic shock.
4. Make a nursing care plan for unconsciousness client.
5. What are the types of incontinence? Explain the nursing management of urinary incontinence.

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ADULT HEALTH NURSING–I

Salient Features

- The textbook is for the BSc nursing degree and is derived from the curriculum established by the Indian Nursing Council.
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- This textbook facilitates the application of theoretical knowledge in practical contexts, enabling students to develop a diverse set of nursing abilities grounded on scientific principles.

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Printed in India

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EMCA House, 23/23-B, Ansari Road,
Daryaganj, New Delhi - 110 002, INDIA
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