लोक सेवा आयोग

नेपाल स्वास्थ्य सेवा,नर्सिंग समूह, सातौँ तह, नर्सिंग अधिकृत पदको प्रतियोगितात्मक लिखित परीक्षा

मिति २०८२/०३/१७

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पूर्णाङ्ग : १००

समय : ३ घंटा

उत्तरपुस्तिकामा प्रश्नपत्रको **KEY** अनिवार्य रूपले उल्लेख गर्नुपर्नेछ। **KEY** उल्लेख नगरेमा उत्तरपुस्तिका रद्द हुनेछ। साथै, परीक्षामा **Calculator, Mobile** जस्ता विद्युतीय उपकरणहरु प्रयोग गर्न पाइने छैन।

Section A

1. Explain the Pathophysiology of Neoplasms (5 Marks)

Neoplasm (Neo = New, Plasm = Growth) refers to an abnormal mass of tissue resulting from neoplasia. Unlike hyperplasia (which stops when the stimulus is removed), neoplastic growth is autonomous, uncoordinated with normal tissue, and persists excessively.

Pathophysiology: The Molecular Basis of Cancer

Neoplasms are fundamentally genetic diseases. They arise from non-lethal genetic damage (mutations) that disrupts the cell cycle.

Key Molecular Mechanisms:

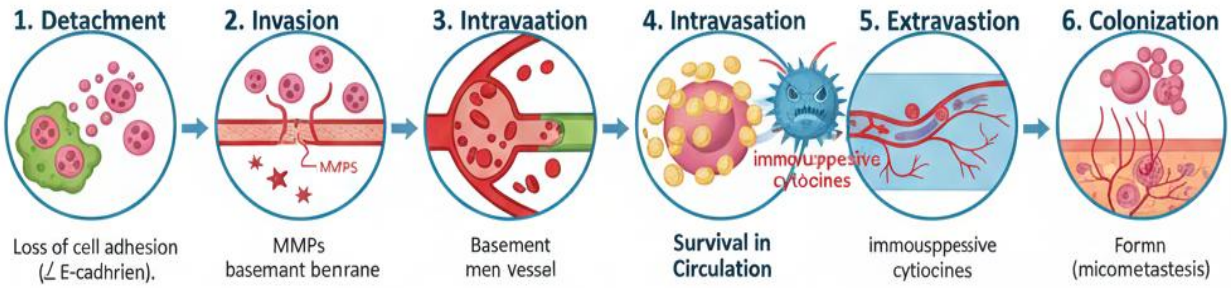
1. **Self-Sufficiency in Growth Signals (Oncogenes):**
   - Normal cells need external signals to divide. Cancer cells generate their own.
   - Mechanism: Mutation converts Proto-oncogenes (normal growth genes) into **Oncogenes**.
   - Analogy: The "gas pedal" is stuck to the floor.
2. **Insensitivity to Growth-Inhibitory Signals (Tumor Suppressors):**
   - Genes like **TP53** (the "Guardian of the Genome") and **RB** gene normally stop cell division if DNA is damaged.
   - Mechanism: Inactivation of these tumor suppressor genes allows cells with DNA errors to replicate.
   - Analogy: The "brakes" of the car have failed.
3. **Evasion of Apoptosis (Programmed Cell Death):**
   - Cancer cells overexpress anti-apoptotic proteins (like BCL2), making them "immortal" despite internal damage.
4. **Sustained Angiogenesis:**
   - Tumors cannot grow beyond 1-2 mm without blood supply. They secrete VEGF (Vascular Endothelial Growth Factor) to sprout new blood vessels, stealing nutrients from the host.

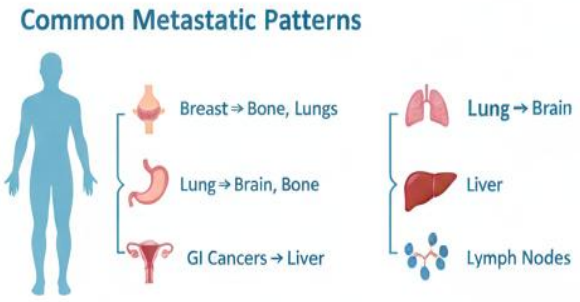
Comparison: Benign vs. Malignant Neoplasms

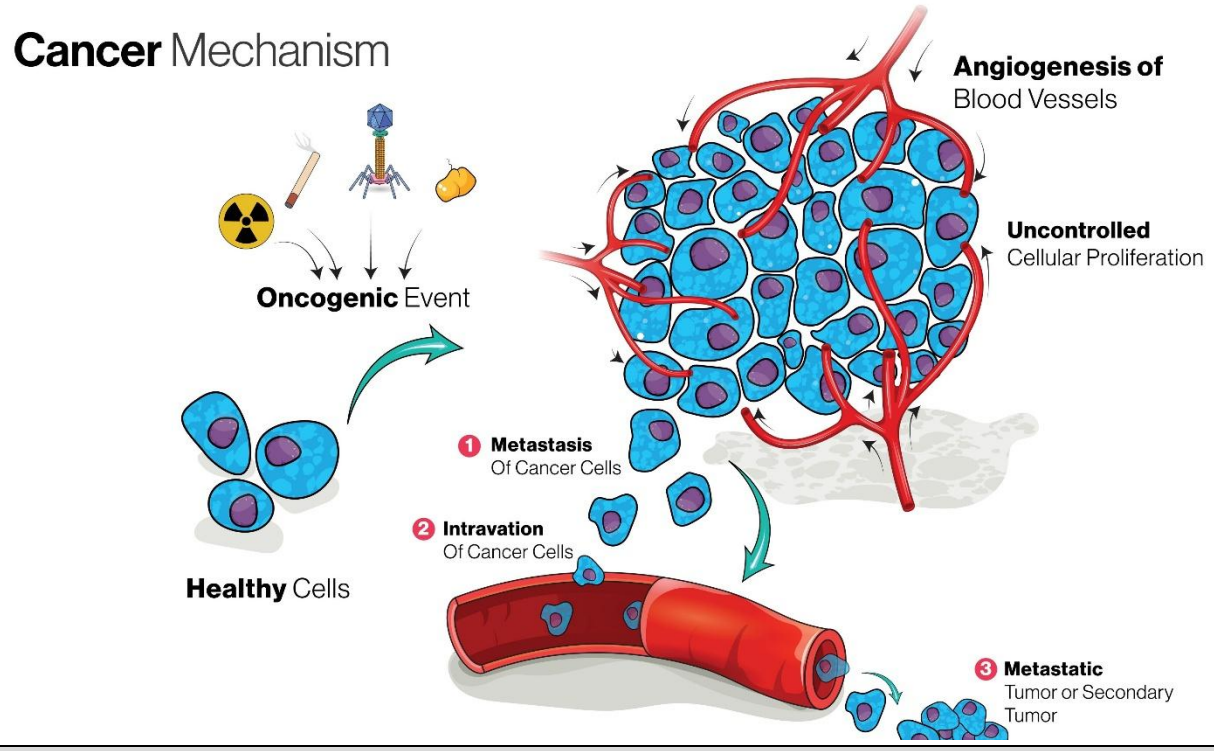
Feature	Benign Tumor	Malignant Tumor (Cancer)
Differentiation	Well-differentiated (resembles parent tissue)	Poorly differentiated (Anaplasia)
Rate of Growth	Slow, expansive	Rapid, infiltrative
Capsule	Usually encapsulated	Non-encapsulated, invades surrounding tissue
Metastasis	**Absent** (Strict rule)	**Present** (The hallmark of cancer)
Prognosis	Generally good	Poor if untreated

The Metastatic Cascade (Spread of Cancer)

1. **Invasion:** Cancer cells breach the basement membrane.
2. **Intravasation:** Entering blood or lymph vessels.
3. **Circulation:** Surviving immune attack in the bloodstream.
4. **Extravasation:** Exiting vessels at a distant site (e.g., Lungs, Liver, Bone).
5. **Colonization:** Growing a new secondary tumor.







2. Explain the Principles of Learning (5 Marks)

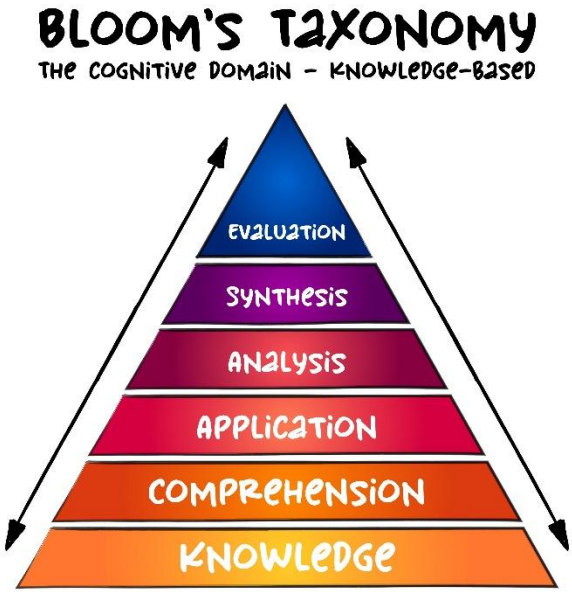
Learning is a change in behavior (knowledge, skills, and attitudes) that persists over time. For nurse educators, applying these principles ensures patient compliance and student success.

Core Principles with Nursing Applications

1. **Principle of Readiness (The Law of Readiness):**
   - Concept: Individuals learn best when they are physically, mentally, and emotionally prepared.
   - Clinical Application: Do not attempt to teach colostomy care to a patient who is currently in denial or severe pain. Address the pain/anxiety first.
2. **Principle of Motivation:**
   - Concept: Motivation is the engine of learning. It can be intrinsic (self-desire) or extrinsic (rewards).
   - Clinical Application: Connect the learning to the patient's goals. "Learning to use this inhaler correctly means you can play with your grandchildren without getting breathless."
3. **Principle of Relevance & Meaningfulness:**
   - Concept: Information must be meaningful to the learner's life context.
   - Clinical Application: When teaching a laborer about back care, focus on lifting techniques relevant to their specific job, not general anatomy.
4. **Principle of Active Involvement:**
   - Concept: "I hear and I forget. I see and I remember. I do and I understand." Active participation increases retention.

- Clinical Application: Use the **Teach-Back Method** or **Return Demonstration**. Ask the patient to show you how they mix their insulin.

5. **Principle of Feedback:**
   - Concept: Immediate, specific, and non-judgmental feedback corrects errors before they become habits.
   - Clinical Application: "You held the syringe correctly, but let's look at the angle of insertion again."
6. **Principle of Repetition (Reinforcement):**
   - Concept: Spaced repetition moves information from short-term to long-term memory.
   - Clinical Application: Review discharge instructions multiple times during the hospital stay, not just 10 minutes before leaving.
7. **Principle of Simple to Complex:**
   - Concept: Organize content logically.
   - Clinical Application: Teach a diabetic patient what glucose is before teaching them how to calculate a sliding scale insulin dose.



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3. Define Disaster. Discuss the Disaster Management in Hospital. (2+8=10 Marks)

Definition of Disaster

A **Disaster** is defined as "A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources." (UNISDR/WHO).

- **Equation:** Disaster = (Vulnerability + Hazard) / Capacity

Hospital Disaster Management Plan

Hospitals must transition from "Daily Mode" to "Disaster Mode" instantly. This is managed via the **Hospital Incident Command System (HICS)**.

A. Pre-Disaster Phase (Preparedness & Planning)

- **Risk Assessment:** Identifying potential threats (e.g., is the hospital in a flood zone or earthquake zone?).

- **Protocol Development:** Creating specific Standard Operating Procedures (SOPs) for Mass Casualty Incidents (MCI).
- **Buffering Capacity:** Plans to discharge stable patients rapidly to free up beds (reverse triage).
- **Drills & Simulation:** Conducting "Mock Drills" twice a year to test response times.

B. During Disaster (Response Phase)

This phase focuses on Command, Control, and Communication (3 Cs).

1. Activation of Incident Command Center:

The Hospital Director usually assumes the role of Incident Commander.

- Logistics Chief: Manages supplies (oxygen, blood, food).
- Planning Chief: Tracks patient numbers and predicts needs.
- Operations Chief: Manages clinical care areas.

2. Triage Management (The Critical Step):

Using the START (Simple Triage and Rapid Treatment) method at the hospital entrance.

Triage Tag	Color	Meaning	RPM Criteria (Respiration, Perfusion, Mental Status)
Immediate	**RED**	Critical; treat now	RR >30, Cap refill >2s, or Altered Mental Status
Delayed	**YELLOW**	Serious; can wait 1-2 hrs	Stable ABCs, but heavy injury (e.g., femur fracture)
Minor	**GREEN**	"Walking Wounded"	Can walk, minor abrasions. Direct to OPD.
Expectant	**BLACK**	Dead or Unsalvageable	No respiration even after opening airway.

3. Zoning of Hospital Areas:

- **Red Zone:** ER/Trauma Bay (for red tag patients).
- **Yellow Zone:** Wards/Converted Corridors (for Yellow tag).
- **Green Zone:** Outpatient Department (for Green tag).
- **Black Zone:** Mortuary (away from public view).

C. Post-Disaster Phase (Recovery)

- **Deactivation:** Formal announcement that the disaster mode is over.
- **Debriefing (Hot Wash):** Analyzing what went wrong immediately after the event.
- **Psychological First Aid:** For staff suffering from compassion fatigue or PTSD.

4. Motivation and Measures to Enhance Job Satisfaction (2+8=10 Marks)

What is Motivation?

Motivation is the internal or external driving force that initiates and sustains behavior toward a goal. In nursing management, it is the art of inspiring the workforce to perform at their peak potential while achieving personal satisfaction.

Measures to Motivate Nurses (Applying Herzberg's Theory)

To motivate nurses effectively, a manager must address both **Hygiene Factors** (to prevent dissatisfaction) and **Motivators** (to create satisfaction).

1. Creating a Positive Work Environment (Hygiene Factors)

- **Safe Staffing Ratios:** Implementing evidence-based nurse-to-patient ratios (e.g., 1:1 in ICU, 1:6 in Gen Ward). This reduces burnout and errors.
- **Resource Availability:** Ensuring nurses don't have to "hunt" for linen, stands, or medications. Frustration logistics kills motivation.
- **Fair Compensation:** Providing hazard night shift differentials, and health insurance.

2. Professional Growth & Recognition (Motivators)

- **Career Mapping:** Offering a clear path from Novice to Expert.
    - Example: Sponsorship for Post-Basic nursing or Master's degrees.
- **Shared Governance:** Establishing unit councils where bedside nurses vote on policy changes. This shifts power from "Top-Down" to "Bottom-Up".
- **Recognition Programs:** "Daisy Award" or similar programs that highlight specific stories of compassionate care, not just clinical skills.

3. Enhancing Job Quality

- **Job Enlargement vs. Enrichment:** Instead of just giving more work (enlargement), give more meaningful work (enrichment), such as leading a quality improvement project.
- **Flexible Scheduling:** Implementing self-scheduling software so nurses can balance work-life commitments (e.g., childcare).

4. Psycho-Social Support

- **Code Lavender:** A rapid response team for emotional support after a traumatic event (e.g., death of a pediatric patient).
- **Open Door Policy:** Ensuring the Matron/Nursing Director is accessible for grievances.

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5. Case Study: Acute Abdomen (2+5+8=15 Marks)

Case Summary:

50yr Male | Sudden onset abdominal pain | Nausea/Vomiting | Obstipation (No gas/feces for 24 hrs).

a) What is his diagnosis?

Diagnosis: Acute Intestinal Obstruction

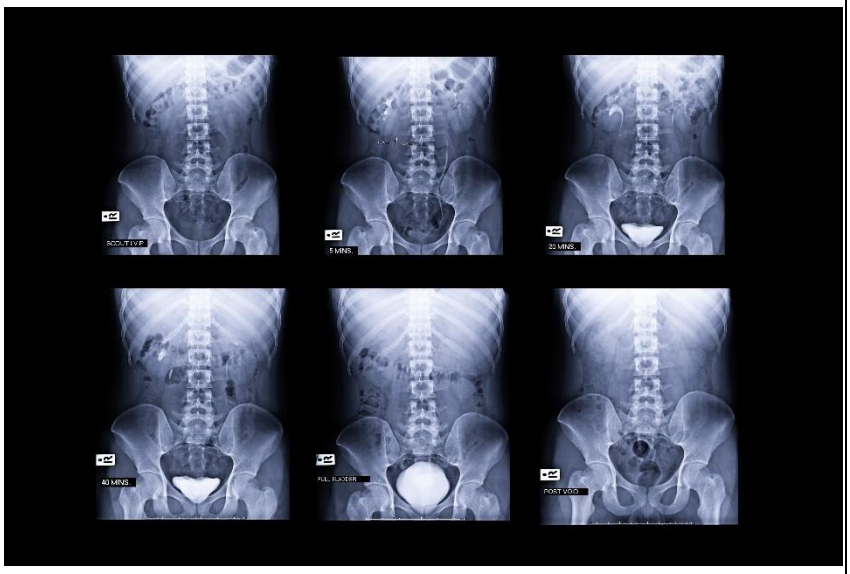
- **Type:** Likely Small Bowel Obstruction (SBO) given the vomiting and severity.
- **Nature:** "Sudden onset severe pain" suggests a mechanical cause (e.g., Volvulus, Adhesion band, or Incarcerated Hernia) potentially leading to strangulation.
- **Key Sign:** Obstipation is the hallmark distinguishing characteristic of complete obstruction versus partial obstruction or gastroenteritis.

b) What investigation do you recommend?

We need to answer: Is it obstructed? Where? Is it strangulated?

1. Radiological Investigations:

- **Abdominal X-Ray (Erect & Supine):** Primary screening tool.
  - **Erect View:** Look for multiple air-fluid levels (step-ladder pattern).
  - **Supine View:** Look for dilated bowel loops (>3cm for small bowel).
- **CT Scan Abdomen (Contrast):** Definitive investigation.
  - Identifies the "Transition Point" (where dilated bowel meets collapsed bowel).
  - Detects signs of ischemia (thickened bowel wall, pneumatosis).



2. Laboratory Investigations:

- **Complete Blood Count (CBC):**
  - High Neutrophils = Inflammation/Infection.
  - Very High WBC (>20,000) = **Red Flag** for Strangulation/Gangrene.
- **Serum Electrolytes & Kidney Function:**
  - Vomiting leads to loss of H^+, K^+, and Cl^-, causing **Metabolic Alkalosis** and **Hypokalemia**.
  - High Urea/Creatinine indicates pre-renal failure due to severe dehydration ("Third spacing" of fluids into the gut lumen).
- **Serum Lactate:** Elevated lactate is a late sign of bowel ischemia (gut is dying).

c) How do you manage this problem?

The goal is to relieve distension, correct fluid/electrolyte deficits, and treat the mechanical blockage.

I. Pre-operative Resuscitation (The "Drip and Suck" Method)

- **Gastrointestinal Decompression:**
  - Insert **Nasogastric (Ryle's) Tube**. Connect to low pressure suction.
  - Benefit: Removes gas/fluid, reduces risk of aspiration pneumonia, relieves pain from distension.
- **Aggressive Fluid Resuscitation:**
  - These patients are severely dehydrated due to fluid sequestration in the bowel.
  - Action: 2 Large bore IV cannulas. Rapid infusion of Crystalloids (Ringer's Lactate).
- **Correction of Electrolytes:**
  - Replace Potassium (K+) strictly after urine output is established.
- **Foley Catheterization:**
  - Essential to monitor hydration. Target urine output: 0.5 - 1.0 ml/kg/hr.

II. Antibiotic Prophylaxis

- Gut barrier breakdown allows bacterial translocation.
- Administer Ceftriaxone + Metronidazole (to cover Gram-negatives and Anaerobes).

III. Surgical Management (Exploratory Laparotomy)

Surgery is indicated if:

1. Signs of Strangulation (Fever, Tachycardia, Localized tenderness).
2. Failure of conservative management (48 hrs).
3. Virgin abdomen (no prior surgeries) implies a structural cause like a tumor or hernia.

- **Procedure:**
  - Midline incision.
  - Locate obstruction point.
  - **Viability Check:** Check bowel color, peristalsis, and pulsation.
  - **Action:** Release band/adhesion OR Resect gangrenous segment and Anastomose.

IV. Nursing Care Considerations

- **Pain Management:** Avoid opioids initially if diagnosis is unclear, but once decided, manage pain aggressively.
- **Mouth Care:** Frequent oral hygiene is vital for patients with NG tubes (mouth breathing causes dryness).
- **Position:** Semi-Fowler's position to reduce tension on abdominal muscles and aid breathing.

Section B

6. Describe the structure and function of the heart. (5 Marks)

The heart is a muscular organ roughly the size of a fist, located in the mediastinum of the thoracic cavity. It functions as the central pump of the circulatory system.

Structure of the Heart

The heart structure is divided into layers, chambers, and valves.

1. Layers of the Heart Wall:

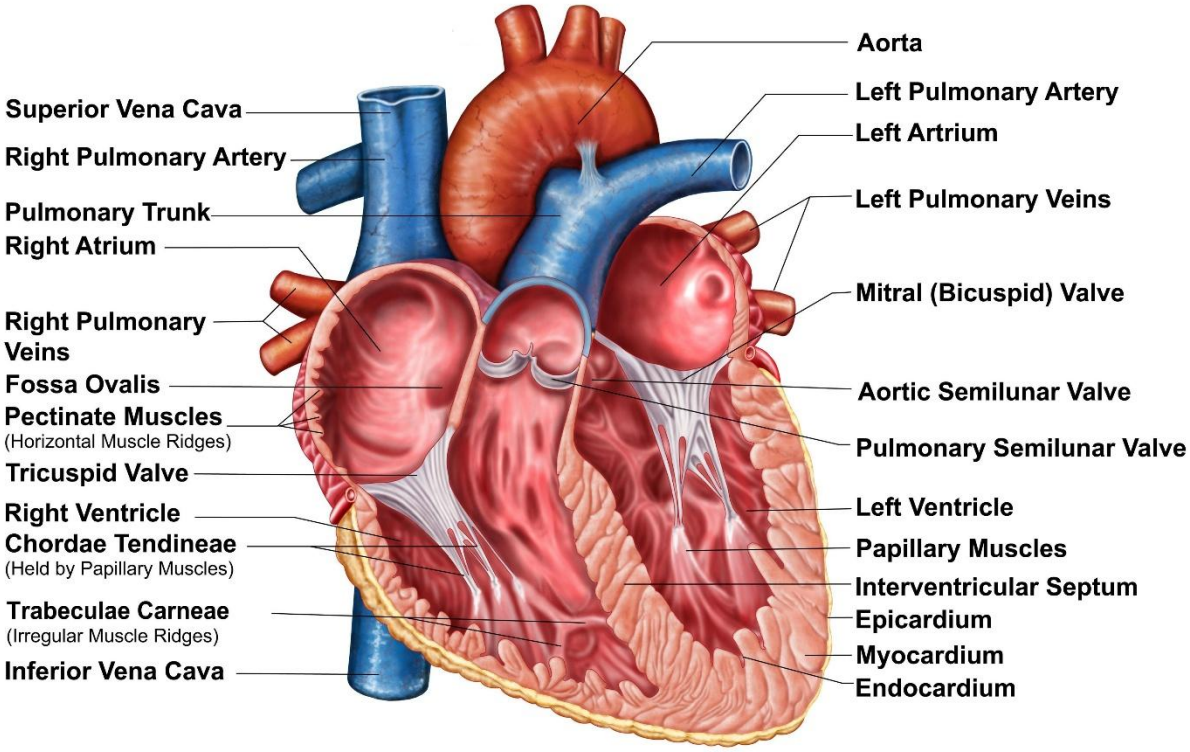
- **Epicardium:** Outer protective layer (Visceral pericardium).
- **Myocardium:** Thick middle layer composed of cardiac muscle responsible for contraction.
- **Endocardium:** Inner smooth lining that facilitates blood flow.

2. Chambers:

- **Right Atrium (RA):** Receives deoxygenated blood from the body via the Superior and Inferior Vena Cava.
- **Right Ventricle (RV):** Pumps deoxygenated blood to the lungs via the Pulmonary Artery.
- **Left Atrium (LA):** Receives oxygenated blood from the lungs via Pulmonary Veins.
- **Left Ventricle (LV):** The thickest chamber; pumps oxygenated blood to the entire body via the Aorta.

3. Valves (Unidirectional flow):

- **Atrioventricular (AV) Valves:** Tricuspid (Right) and Mitral/Bicuspid (Left). Prevent backflow into atria.
- **Semilunar Valves:** Pulmonary and Aortic valves. Prevent backflow into ventricles.



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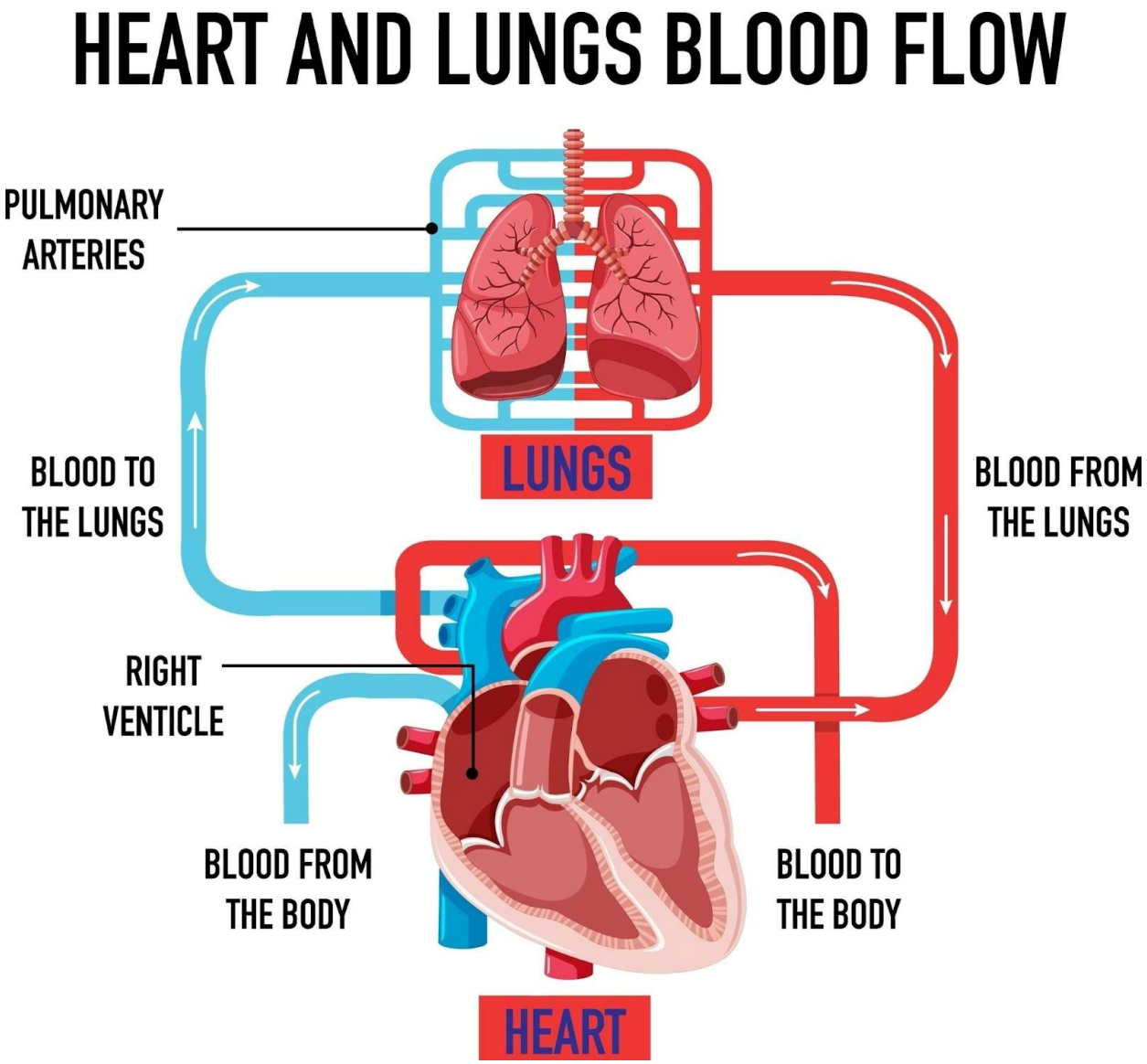
Infographic: Blood Flow Through the Heart



Functions of the Heart

1. **Pumping Blood (Double Circulation):**
    - Pulmonary Circulation: Right side pumps blood to lungs for gas exchange (CO_2 out, O_2 in).
    - Systemic Circulation: Left side pumps oxygenated blood to tissues for nutrient delivery.
2. **Generating Blood Pressure:** Contractions generate hydrostatic pressure to force blood through vessels.
3. **Regulating Blood Supply:** Adjusts heart rate and stroke volume based on metabolic needs (e.g., exercise vs. rest).

7. Explain principles and methods of pain management in burn patient. (2+3=5 Marks)

Burn pain is complex, fluctuating, and one of the most severe types of pain. Management requires a proactive, multimodal approach.

Principles of Burn Pain Management

1. **Differentiate Types of Pain:**
    - Background Pain: Constant dull pain from the injury site.
    - Breakthrough Pain: Sudden spikes in pain despite medication.
    - Procedural Pain: Intense pain during dressing changes or debridement.
2. **"Pain is what the patient says it is":** Use valid scales (VAS or Faces scale) regularly.
3. **Pre-emptive Analgesia:** Administer analgesics before painful procedures (dressing changes/physiotherapy).
4. **Multimodal Approach:** Combining drugs with different mechanisms to reduce side effects.

Methods of Management

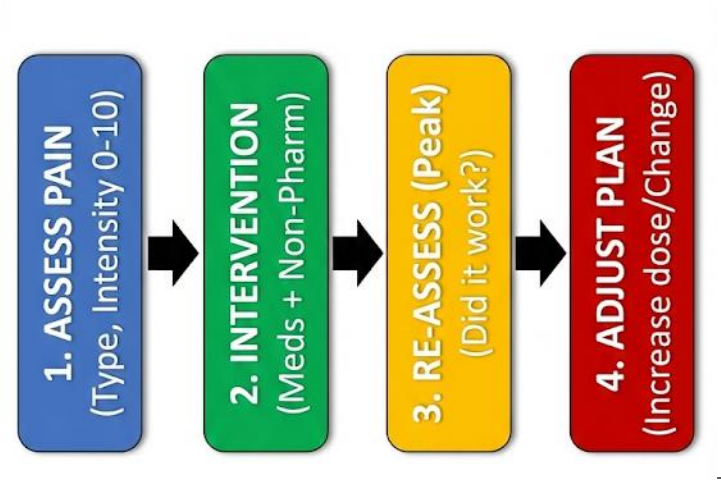
A. Pharmacological (The WHO Ladder)

Drug Class	Use Case	Examples
Opioids (Cornerstone)	Severe background & procedural pain	Morphine, Fentanyl (short-acting for procedures).
NSAIDs/Paracetamol	Mild to moderate pain; opioid-sparing	Ibuprofen, Acetaminophen.
Adjuvants	Neuropathic pain (nerve damage)	Gabapentin, Pregabalin (for itching/burning sensation).
Anxiolytics	Anxiety worsens pain perception	Midazolam or Lorazepam (pre-procedure).

B. Non-Pharmacological (Complementary)

- **Distraction:** Virtual reality, music, or conversation during dressing changes.
- **Cooling:** Cool running water (for first aid only), avoiding hypothermia.
- **Positioning:** Elevating burned limbs to reduce edema and throbbing pain.

Infographic: Burn Pain Assessment Cycle



8. What is geriatric syndrome? List the geriatric syndrome and discuss the prevention of it. (2+4+4=10 Marks)

Definition

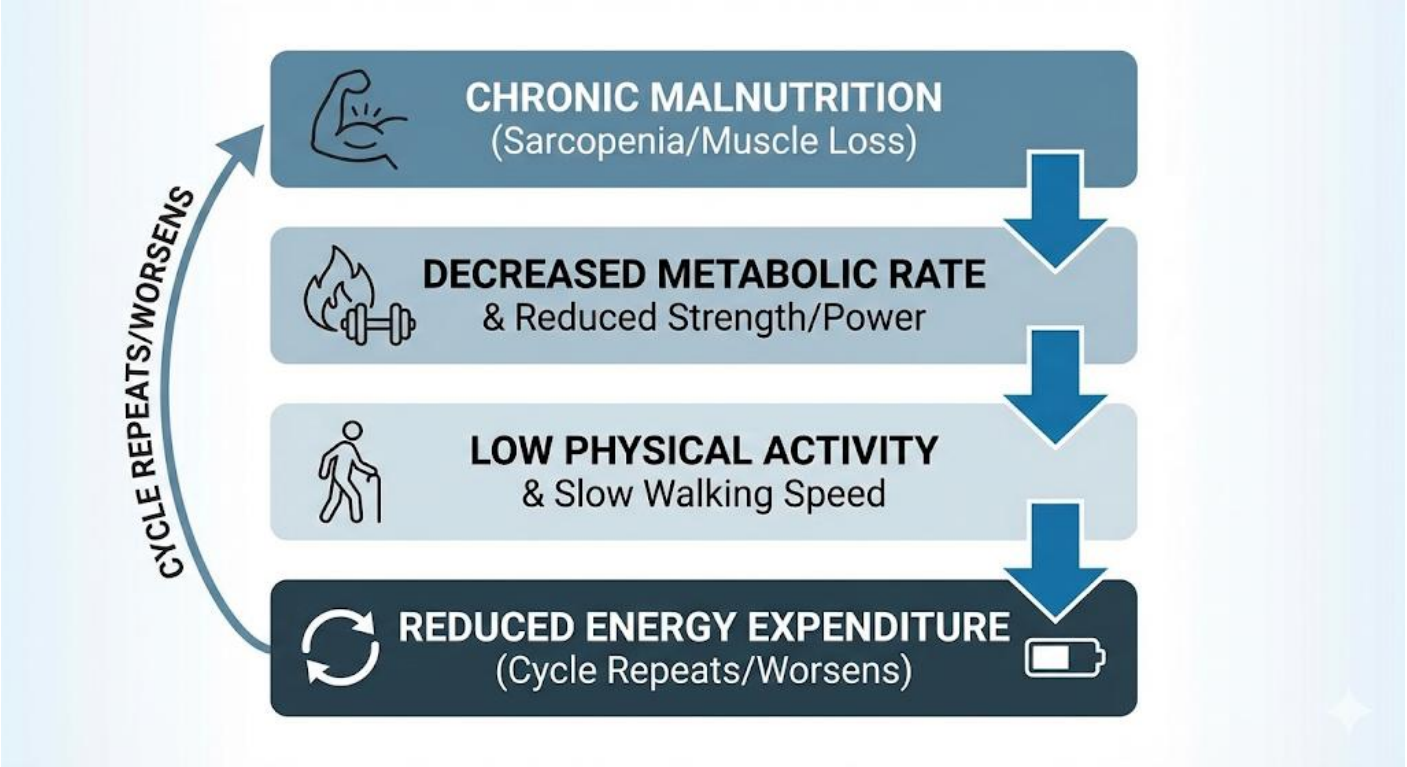
Geriatric Syndromes are clinical conditions in older adults that do not fit into discrete disease categories. They are multifactorial health conditions that occur when the accumulated effects of impairments in multiple systems render an older person vulnerable to situational challenges.

- Key Characteristic: They are not diseases but clinical presentations (e.g., falling is a syndrome, not a single disease).

List of Common Geriatric Syndromes (The "Giants of Geriatrics")

1. **Falls & Instability**
2. **Incontinence** (Urinary or Fecal)
3. **Frailty** (Weakness, weight loss, low activity)
4. **Delirium** (Acute confusion) & **Dementia**
5. **Polypharmacy** (Use of multiple medications)
6. **Pressure Ulcers**
7. **Sleep Disorders**

Infographic: The Cycle of Frailty



Prevention Strategies

1. Prevention of Falls:

- **Environmental Modification:** Remove rugs, install grab bars in toilets, ensure good lighting.

- **Exercise:** Tai Chi or balance training to strengthen muscles.
- **Vision/Hearing Checks:** Regular correction of sensory deficits.

2. Prevention of Delirium:

- **Orientation:** Keep clocks/calendars visible; engage in conversation.
- **Sleep Hygiene:** Avoid interruptions at night; reduce noise.
- **Hydration:** Dehydration is a major trigger for confusion.

3. Prevention of Polypharmacy:

- **Medication Review:** "Deprescribing" unnecessary drugs regularly.
- **Compliance Aids:** Using pillboxes to prevent overdose/underdose.

4. Prevention of Frailty & Pressure Ulcers:

- **Nutrition:** High-protein diet to maintain muscle mass (Sarcopenia prevention).
- **Mobility:** "Bed rest is the enemy." Encourage early mobilization.
- **Skin Care:** Regular turning (q2h) for bedridden patients; keeping skin dry.

9. What are the key developmental tasks of young adulthood? Explain how these tasks influence a person's physical, emotional and social well-being. (4+6=10 Marks)

Young Adulthood (Approx. ages 19–40) is the stage following adolescence.

Key Developmental Tasks (Based on Havighurst & Erikson)

1. **Selecting a Mate:** Finding a life partner.
2. **Learning to Live with a Partner:** Adjusting to cohabitation/marriage.
3. **Starting a Family:** Deciding to have children and rearing them.
4. **Starting an Occupation:** Establishing a career and financial independence.
5. **Assuming Civic Responsibility:** Becoming a voting, contributing citizen.
6. **Finding a Congenial Social Group:** Building adult friendships.

Influence on Well-being

1. Physical Well-being:

- Positive: Establishing a career usually brings financial resources for better nutrition, gym memberships, and healthcare access.
- Negative: The stress of "climbing the ladder" or caring for young children can lead to sleep deprivation, poor diet ("fast food"), or substance use. Peak physical performance occurs here, but lifestyle habits set the stage for chronic disease later.

2. Emotional Well-being (Intimacy vs. Isolation):

- Erikson's Conflict: Success in forming intimate relationships leads to **Love** and emotional stability.
- Failure: Inability to form bonds results in **Isolation**, loneliness, and depression.
- Parenting: Bringing up children brings immense joy but also significant anxiety and emotional load.

3. Social Well-being:

- Civic Roles: Joining professional bodies or community groups creates a sense of belonging and purpose.
- Social Network: A supportive partner and friend circle act as a buffer against life stresses. Conversely, social isolation in this phase is a strong predictor of poor mental health.

10. Define electroconvulsive therapy (ECT). List out the indication and contraindication of ECT. Discuss the nursing management of patient undergoing ECT. (1+3+6=10 Marks)

Definition

Electroconvulsive Therapy (ECT) is a medical treatment most commonly used in patients with severe major depression or bipolar disorder that has not responded to other treatments. It involves a brief electrical stimulation of the brain while the patient is under anesthesia to induce a generalized **tonic-clonic seizure** (usually < 1 minute) for therapeutic effect.

Indications & Contraindications

Indications	Contraindications
• **Severe Major Depression (esp. w/ psychosis)**	**Absolute:** None (in life-saving scenarios)
• **Suicidal Tendency (Rapid response needed)**	**Relative:**
• **Catatonia (Frozen state)**	• Increased Intracranial Pressure (ICP)
• **Bipolar Mania (Drug-resistant)**	• Recent MI or Stroke (< 3 months)
• **Schizophrenia (Catatonic type)**	• Severe Hypertension / Retinal Detachment

Nursing Management

A. Pre-Procedural Care

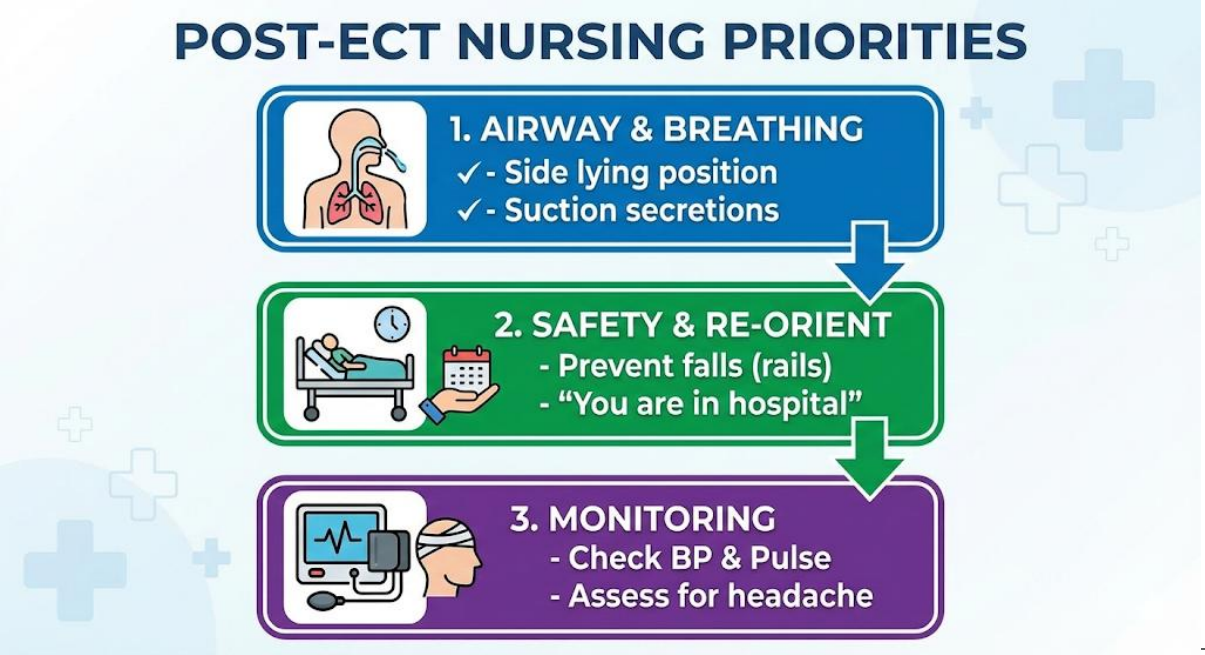
1. **Consent:** Ensure informed written consent is obtained.
2. **NPO Status:** Keep patient fasting for 4-6 hours to prevent aspiration.
3. **Preparation:** Remove dentures, glasses, jewelry. Administer Atropine (to reduce secretions).
4. **Baseline Vitals:** Record BP, Pulse, Respiration.

B. Intra-Procedural Care

1. **Positioning:** Supine position.
2. **Airway Protection:** Insert a **Mouth Bite Block** to prevent tongue biting.
3. **Oxygenation:** Administer 100% O_2 via mask.
4. **Monitoring:** Observe seizure duration (Optimal: 25–60 secs).

C. Post-Procedural Care

Infographic: Post-ECT Nursing Priorities



11. Case Study: Obstetric Emergency (2+8+5=15 Marks)

Case Summary:

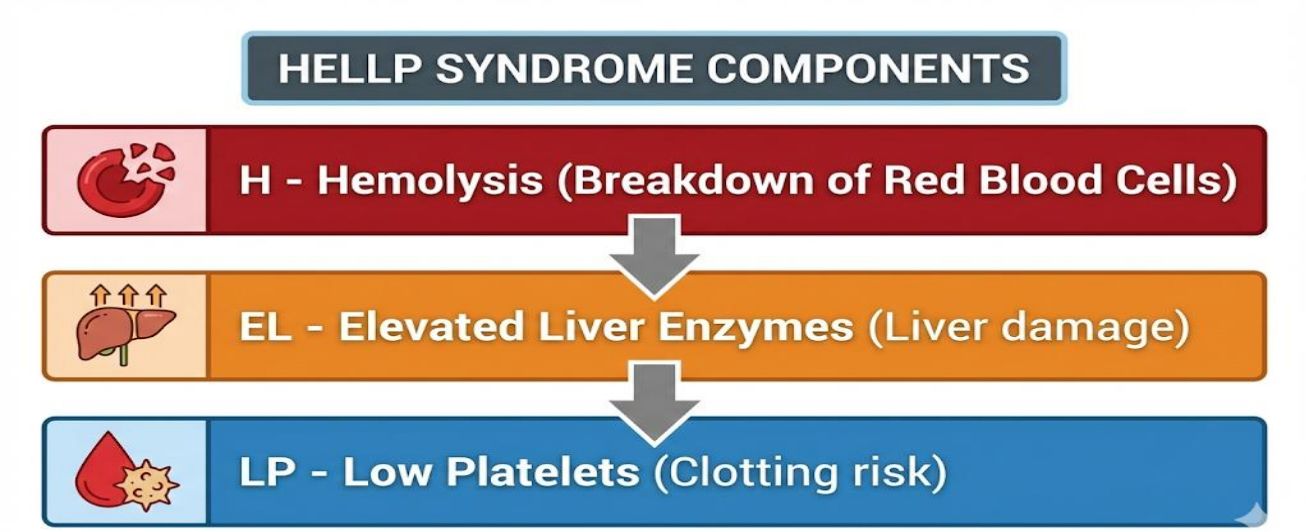
17yr Primigravida | 32 Weeks Gestation | BP 180/110 mmHg | +++ Proteinuria | Elevated Liver Enzymes | Low Platelets

a) What is her possible diagnosis?

Diagnosis: Severe Pre-eclampsia complicated by HELLP Syndrome.

- Rationale: The patient exhibits the classic triad of HELLP syndrome, a life-threatening complication of pre-eclampsia.

Infographic: HELLP Syndrome Triad



b) Elaborate the management of this condition.

1. Immediate Stabilization

- **Airway/Breathing:** Ensure patent airway, admin O_2.
- **Access:** Secure 2 wide-bore IV lines.
- **Position:** Left Lateral Position to improve placental perfusion.

2. Seizure Prophylaxis (Magnesium Sulfate - MgSO4)

- Goal: Prevent Eclampsia (Seizures).
- **Loading Dose:** 4g IV slowly over 15-20 mins.
- **Maintenance Dose:** 1g/hour IV infusion.

Infographic: Magnesium Sulfate Safety Check

Before every dose, the nurse MUST check:

1. **R**espiratory Rate: Must be $\ge$ 12/min
2. **U**rine Output: Must be $\ge$ 30ml/hour
3. Reflexes: Deep Tendon Reflexes (DTR) must be present
   Antidote: Calcium Gluconate (Keep at bedside)

3. Antihypertensive Therapy

- **Drugs:** IV Labetalol or IV Hydralazine.
- **Target:** Lower BP to safe range (140-150/90-100) slowly.

4. Obstetric Management (Definitive Treatment)

- **Delivery:** Immediate delivery is usually indicated for HELLP syndrome, regardless of gestational age, once mother is stable.
- **Corticosteroids:** Betamethasone (if delivery can be delayed 24hrs) for fetal lung maturity.

c) Discuss possible complications.

Maternal Complications	Fetal/Neonatal Complications
Eclampsia: Seizures leading to coma.	**IUGR:** Intrauterine Growth Restriction.
DIC: Disseminated Intravascular Coagulation (uncontrolled bleeding).	**Prematurity:** RDS (Respiratory Distress Syndrome).
Placental Abruption: Separation of placenta from uterus.	**Birth Asphyxia:** Oxygen deprivation.
Pulmonary Edema: Fluid in lungs.	**Thrombocytopenia:** Low platelets in baby.