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1. First cellular change in hypoxia:

a. Decreased oxidative phosphorylation in mitochondria
b. Cellular swelling
c. Alteration in cellular membrane permeability
d. Clumping of nuclear chromatin

Ans: a
Ref: Robbins Basic Pathology 10th Edition, Page No: 34
Although there are no definitive morphologic or biochemical correlates of irreversibility, it is consistently characterized by three phenomena:

- the *inability to restore mitochondrial function* (oxidative phosphorylation and adenosine triphosphate [ATP] generation) even after resolution of the original injury;
- the *loss of structure and functions of the plasma membrane and intracellular membranes*;
- and the *loss of DNA and chromatin structural integrity*.

Feature	Necrosis	Apoptosis
Cell size	Enlarged (swelling)	Reduced (shrinkage)
Nucleus	Pyknosis → karyorrhexis → karyolysis	Fragmentation into nucleosome-sized fragments
Plasma membrane	Disrupted	Intact; altered structure, especially orientation of lipids
Cellular contents	Enzymatic digestion; may leak out of cell	Intact; may be released in apoptotic bodies
Adjacent inflammation	Frequent	No
Physiologic or pathologic role	Invariably pathologic (culmination of irreversible cell injury)	Often physiologic means of eliminating unwanted cells; may be pathologic after some forms of cell injury, especially DNA and protein damage

2. Coagulative necrosis is seen in:

a. Brain
b. Breast
c. Liver
d. All

Ans: c
Ref: Robbins Basic Pathology 10th Edition, Page No: 36, 37
Coagulative necrosis:

- Form of necrosis in which the underlying tissue architecture is preserved for at least several days after death of cells in the tissue.
- The affected tissues take on a firm texture. Presumably the injury denatures not only structural proteins but also enzymes, thereby blocking the proteolysis of the dead cells; as a result, eosinophilic, anucleate cells may persist for days or weeks.
- Leukocytes are recruited to the site of necrosis, and the dead cells are ultimately digested by the action of lysosomal enzymes of the leukocytes.
- The cellular debris is then removed by phagocytosis mediated primarily by infiltrating neutrophils and macrophages.
- Coagulative necrosis is characteristic of infarcts (areas of necrosis caused by ischemia) in all solid organs except the brain.

Liquefactive necrosis:

- Seen in focal bacterial and, occasionally, fungal infections because microbes stimulate rapid accumulation of inflammatory cells, and the enzymes of leukocytes digest ("liquefy") the tissue. For obscure reasons, hypoxic death of cells within the central nervous system often evokes liquefactive necrosis.
- Whatever the pathogenesis, the dead cells are completely digested, transforming the tissue into a viscous liquid that is eventually removed by phagocytes.
- If the process is initiated by acute inflammation, as in a bacterial infection, the material is frequently creamy yellow and is called pus.

Gangrenous necrosis

- Not a distinctive pattern of cell death, the term is still commonly used in clinical practice.
- It usually refers to the condition of a limb (generally the lower leg) that has lost its blood supply and has undergone coagulative necrosis involving multiple tissue layers.
- When bacterial infection is superimposed, the morphologic appearance changes to liquefactive necrosis because of the destructive contents of the bacteria and the attracted leukocytes (resulting in so-called "wet gangrene").

Caseous necrosis:

- is most often encountered in foci of tuberculous infection.
- Caseous means "cheeselike," referring to the friable yellow-white appearance of the area of necrosis on gross examination.

Fat necrosis:

- Refers to focal areas of fat destruction, typically resulting from the release of activated pancreatic lipases into the substance of the pancreas and the peritoneal cavity.
- This occurs in the calamitous abdominal emergency known as acute pancreatitis. In this disorder, pancreatic enzymes that have leaked out of acinar cells and ducts liquefy the membranes of fat cells in the peritoneum, and lipases split the triglyceride esters contained within fat cells. The released fatty acids combine with calcium to produce grossly visible chalky white areas (fat saponification), which enable the surgeon and the pathologist to identify the lesions.

Fibrinoid necrosis:

- Special form of necrosis. It usually occurs in immune reactions in which complexes of antigens and antibodies are deposited in the walls of blood vessels, but it also may occur in severe hypertension.
- Deposited immune complexes and plasma proteins that leak into the wall of damaged vessels produce a bright pink, amorphous appearance on H&E preparations called fibrinoid (fibrinlike) by pathologists.
- The immunologically mediated diseases (e.g., polyarteritis nodosa) show this.

3. C-C beta chemokines includes:

a. IL-8
b. Eotaxin
c. Lymphotactin
d. Fractalkine

Ans: b
Ref: Robbins Basic Pathology 10th Edition, Page No: 74

Chemokines

Chemokines are a family of small (8–10 kD) proteins that act primarily as chemoattractants for specific types of leukocytes. About 40 different chemokines and 20 different receptors for chemokines have been identified. They are classified into four major groups, according to the arrangement of cysteine (C) residues in the proteins:

C-X-C chemokines

- have one amino acid residue separating the first two of the four conserved cysteines.
- These chemokines act primarily on neutrophils. IL-8 (now called CXCL8) is typical of this group. It is secreted by activated macrophages, endothelial cells, and other cell types, and causes activation and chemotaxis of neutrophils, with limited activity on monocytes and eosinophils.
- Its most important inducers are microbial products and cytokines, mainly IL-1 and TNF.

C-C chemokines:

- Have the first two conserved cysteine residues adjacent.

- The C-C chemokines, which include monocyte chemoattractant protein (MCP-1, CCL2), eotaxin (CCL11), and macrophage inflammatory protein- 1α (MIP-1α, CCL3), mainly serve as chemoattractants for monocytes, eosinophils, basophils, and lymphocytes.
- Although most of the chemokines in this class have overlapping actions, eotaxin selectively recruits eosinophils.

C chemokines:

- Lack the first and third of the four conserved cysteines.
- The C chemokines (e.g., lymphotactin, XCL1) are relatively specific for lymphocytes.

CX3C chemokine:

- Contain three amino acids between the first two cysteines.
- The only known member of this class is called fractalkine (CX3CL1).
- This chemokine exists in two forms: a cell surface-bound protein induced on endothelial cells by inflammatory cytokines that promotes strong adhesion of monocytes and T cells, and a soluble form, derived by proteolysis of the membrane bound protein, that has potent chemoattractant activity for the same cells.

4. Principal source of TNF is:

a. Macrophage
b. Dendritic cells
c. NKC
d. INF-gamma

Ans: a
Ref: Robbins Basic Pathology 10th Edition, Page No: 74

Table 3.7 Cytokines in Inflammation

Cytokine	Principal Sources	Principal Actions in Inflammation
In Acute Inflammation		
TNF	Macrophages, mast cells, T lymphocytes	Stimulates expression of endothelial adhesion molecules and secretion of other cytokines; systemic effects
IL-1	Macrophages, endothelial cells, some epithelial cells	Similar to TNF; greater role in fever
IL-6	Macrophages, other cells	Systemic effects (acute phase response)
Chemokines	Macrophages, endothelial cells, T lymphocytes, mast cells, other cell types	Recruitment of leukocytes to sites of inflammation; migration of cells in normal tissues
IL-17	T lymphocytes	Recruitment of neutrophils and monocytes
In Chronic Inflammation		
IL-12	Dendritic cells, macrophages	Increased production of IFN-γ
IFN-γ	T lymphocytes, NK cells	Activation of macrophages (increased ability to kill microbes and tumor cells)
IL-17	T lymphocytes	Recruitment of neutrophils and monocytes

The most important cytokines involved in inflammatory reactions are listed. Many other cytokines may play lesser roles in inflammation. There is also considerable overlap between the cytokines involved in acute and chronic inflammation. Specifically, all the cytokines listed under acute inflammation may also contribute to chronic inflammatory reactions.
IFN-γ, Interferon-γ; *IL-1*, interleukin-1; *NK*, natural killer; *TNF*, tumor necrosis factor.

5. D-Dimer is the most sensitive diagnostic test for:

a. Pulmonary embolism
b. Acute pulmonary oedema
c. Cardiac tamponade
d. Acute myocardial infarction

Ans: a
Ref: Goljan Pathology 5th Edition, Page No: 438, 262, 264, 398
Laboratory findings in pulmonary embolism:

- respiratory alkalosis (arterial Pco2 <33 mm Hg).
- Pao2 <80 mm Hg (90% of cases; perfusion defect).
- increase in a-a gradient (100% of cases).
- increase in d-dimers

Venous thromboses

- Contains entrapped red blood cells (RBCs; primary component), white blood cells (WBCs), and platelets held together by fibrin.
- Diagnosis (Dx) of DVT is confirmed by using venous duplex US (95% sensitivity/specificity) plus a serum d-dimer assay (88%–97% sensitivity;.
- d-Dimers are a sign that the fibrinolytic system is active in breaking down fibrin in the clot.
- Most often occur in the deep veins of the lower extremity (e.g., veins in the calf [anterior, posterior, peroneal veins; calf venous sinusoids]; popliteal vein; and the femoral vein)
- Less common sites include the portal vein, hepatic vein, and dural sinuses in the brain.

d-Dimer testing is of clinical use when there is a suspicion for deep vein thrombosis (DVT), pulmonary thromboembolism (TE), and disseminated intravascular coagulation (DIC).

6. BRCA 1 gene is located on?

a. Chromosome 13
b. Chromosome 11
c. Chromosome 17
d. Chromosome 22

Ans: c

Features	BRCA1	BRCA2
Chromosome	17q21	13q12.3
Function	Tumor suppressor, Transcriptional regulation, Role in DNA repair	Tumor suppressor, Transcriptional regulation, Role in DNA repair

7. Gene involved in Le-Fraumeni syndrome is:

a. Rb
b. TP53
c. CDKN2A
d. d.NF2

Ans: b
Ref: Robbins Basic Pathology 10th Edition, Page No: 201

Table 6.4 Inherited Predisposition to Cancer

Inherited Predisposition	Gene(s)
Autosomal Dominant Cancer Syndromes	
Retinoblastoma	*RB*
Li-Fraumeni syndrome (various tumors)	*TP53*
Melanoma	*CDKN2A*
Familial adenomatous polyposis/colon cancer	*APC*
Neurofibromatosis 1 and 2	*NF1*, *NF2*
Breast and ovarian tumors	*BRCA1*, *BRCA2*
Multiple endocrine neoplasia 1 and 2	*MEN1*, *RET*
Hereditary nonpolyposis colon cancer	*MSH2*, *MLH1*, *MSH6*
Nevoid basal cell carcinoma syndrome	*PTCH1*
Autosomal Recessive Syndromes of Defective DNA Repair	
Xeroderma pigmentosum	Diverse genes involved in nucleotide excision repair
Ataxia-telangiectasia	*ATM*
Bloom syndrome	*BLM*
Fanconi anemia	Diverse genes involved in repair of DNA cross-links

8. Burr cell is seen in:

a. Uremia
b. Hepatocellular carcinoma
c. Gastric carcinoma
d. Ovarian carcinoma

Ans: a
Ref: Goljan Pathology 5th Edition, Page No: 339
Anemia in chronic renal failure (CRF)

- Caused by a combination of a decrease in EPO and ACD.
- Anemia usually occurs when the creatinine clearance falls below 50 mL/min.
- Normocytic anemia.
- Presence of burr cells in the peripheral blood (i.e., RBCs with undulating membranes).
- Prolonged bleeding time because of a defect in platelet aggregation in the formation of a platelet thrombus.
- Defect in platelet aggregation reversible with renal dialysis

9. Not consistent with intravascular hemolysis:

a. Increased plasma/urine Hb
b. Hemosiderinuria
c. Increased serum haptoglobin
d. Increased serum LDH

Ans: c
Ref: Goljan Pathology 5th Edition, Page No: 341
Intravascular hemolysis:
Refers to RBC hemolysis that occurs within the blood vessels
Causes include:

- Enzyme deficiency (e.g., pyruvate kinase [PK] deficiency).
- Complement destruction (e.g., IgM-mediated hemolysis; IgG-mediated in some cases).
- Mechanical damage (e.g., calcific aortic stenosis).

Laboratory findings include:

- Increased plasma/urine Hb.
- Hemosiderinuria (proximal renal tubule cells convert iron in Hb into hemosiderin).
- Decreased serum haptoglobin. Haptoglobin combines with Hb and is phagocytosed by MPs
- Increased serum LDH from the hemolyzed RBCs.

10. Reed Sternberg cells are found in:

a. Hodgkin's disease
b. Sickle cell anaemia
c. Thalassemia
d. CML

Ans: a
Ref: Robbins Basic Pathology 10th Edition, Page No: 474
The sine qua non of Hodgkin lymphoma is the Reed-Sternberg (RS) cell, a very large cell (15 to 45 µm in diameter) with an enormous multilobate nucleus, exceptionally prominent nucleoli, and abundant, usually slightly eosinophilic, cytoplasm.
Particularly characteristic are cells with two mirror image nuclei or nuclear lobes, each containing a large (inclusion-like) acidophilic nucleolus surrounded by a clear zone, features that impart an owl-eye appearance.
Typical RS cells and variants have a characteristic immunophenotype, as they express CD15 and CD30 and fail to express CD45 (leukocyte common antigen), B cell antigens, and T cell antigens.

11. Vascular pathology of benign hypertension includes:

a. Segmental fibrinoid necrosis
b. Hyaline arteriosclerosis
c. Periarteritis
d. Loss of internal elastic lamina

Ans: b
Ref: Robbins Basic Pathology 10th Edition, Page No: 367, 368
Hyaline arteriolosclerosis is associated with benign hypertension. It is marked by homogeneous, pink hyaline thickening of the arteriolar walls, with loss of underlying structural detail, and luminal narrowing.
Hyperplastic arteriolosclerosis is more typical of severe hypertension. Vessels exhibit "onion skin," concentric, laminated thickening of arteriolar walls and luminal narrowing.

12. Bronchogenic sequestration is seen in which lobe:

a. Left lower lobe

b. Right upper lobe
c. Left middle lobe
d. Left upper lobe

Ans: a
Ref: Berrocal T, Madrid C, Novo S et-al. Congenital anomalies of the tracheobronchial tree, lung, and mediastinum: embryology, radiology, and pathology. Radiographics. 24 (1): e17.
Pulmonary sequestration, also called accessory lung, refers to the aberrant formation of segmental lung tissue that has no connection with the bronchial tree or pulmonary arteries. It is a bronchopulmonary foregut malformation (BPFM).
The two types of sequestration are similar in their relationship to the bronchial tree and arterial supply/venous drainage but differ in their relationship to the pleura.

- Overall, sequestration preferentially affects the lower lobes. 60% of intralobar sequestrations affect the left lower lobe, and 40% the right lower lobe. Extralobar sequestrations almost always affect the left lower lobe, however, ~10% of extralobar sequestrations can be subdiaphragmatic.
- The blood supply of 75% of pulmonary sequestrations is derived from the thoracic or abdominal aorta.
- The remaining 25% of sequestrations receive their blood flow from the subclavian, intercostal, pulmonary, pericardiophrenic, innominate, internal mammary, celiac, splenic, or renal arteries.
- By definition, there is no communication with the tracheobronchial tree. In the vast majority of cases, the abnormal lung tissue has a systemic arterial supply which is usually a branch of the aorta.

Intralobar sequestrations

- Venous drainage commonly occurs via the pulmonary veins, but can occur through the azygous-hemiazygous system, portal vein, right atrium or inferior vena cava
- Closely connected to the adjacent normal lung and do not have a separate pleura

Extralobar sequestrations

- Venous drainage most commonly through the systemic veins into the right atrium (but is variable)
- Separated from any surrounding lung by its own pleura

13. Cavity formation is observed in one of the following bronchogenic carcinoma:

a. Squamous cell
b. Oat cell
c. Adenocarcinoma
d. Bronchoalveolar

Ans: a
Ref: Robbins Basic Pathology 10th Edition, Page No: 539
Squamous cell carcinomas are more common in men than in women and are closely correlated with a smoking history; they tend to arise centrally in major bronchi and eventually spread to local hilar nodes, but they disseminate outside the thorax later than do other histologic types. Large lesions may undergo central necrosis, giving rise to cavitation.
Adenocarcinomas are usually peripherally located, but also may occur closer to the hilum. In general, adenocarcinomas grow slowly and form smaller masses than do the other subtypes, but they tend to metastasize widely at an early stage. They may assume a variety of growth patterns, including acinar (gland-forming); papillary; mucinous which is often multifocal and may manifest as pneumonia-like consolidation); and solid types. The solid variant often requires demonstration of intracellular mucin by special stains to establish its adenocarcinomatous differentiation.

14. Salt losing nephritis is due to:

a. Lupus nephritis
b. Streptococcal infection
c. Interstitial nephritis
d. Goodpasture's syndrome

Ans: c
Ref: What are possible renal complications of hypovolemic hyponatremia caused by salt wasting nephropathy? By Eric E Simon in Medscape.
Salt-wasting nephropathy causing hypovolemic hyponatremia may rarely develop in a range of renal disorders (eg, interstitial nephropathy, medullary cystic disease, polycystic kidney disease, partial urinary obstruction) with low salt intake.

15. Which process makes the bacteria 'tasty' to the macrophages:
a. Margination
b. Diapedesis
c. Opsonisation
d. Chemotaxis

Ans: c
Ref: Robbins Basic Pathology 10th Edition, Page No: 76
Opsonization and phagocytosis
C3b and its cleavage product iC3b (inactive C3b), when fixed to a microbial cell wall, act as opsonins and **promote phagocytosis** by neutrophils and macrophages, which bear cell surface receptors for these complement fragments.

16. Catecholamines are increased in:
a. Neuroblastoma
b. Retinoblastoma
c. Medulloblastoma
d. Nephroblastoma

Ans: a
Ref: Robbins Basic Pathology 10th Edition, Page No: 286, 287
Ref: Goljan Pathology 5th Edition, Page No: 694
Neuroblastoma
- The term neuroblastic includes tumors of the sympathetic ganglia and adrenal medulla that are derived from primordial neural crest cells populating these sites; neuroblastoma is the most important member of this family.
- Immunochemical detection of nerual markers, such as neuron-specific enolase, and demonstration on ultrastructural studies of small, membrane-bound, cytoplasmic catecholamine-containing secretory granules.
- Most often occurs in children <5 years old. Third MC cancer in children. Mean age of onset is 18 months.
- Primarily located in the adrenal medulla; less commonly located in the posterior mediastinum (paraspinal location)
- Caused by an amplification of the N-MYC oncogene, a nuclear transcriber
- "Small cell" tumor that is composed of malignant neuroblasts
- Homer-Wright rosettes are present
- Rosettes are neuroblasts that are located around a central space.

- Electron microscopy shows neurosecretory granules in the cytoplasm.
- Neuroblastomas are the cause of the opsoclonus-myoclonus syndrome.
- Paraneoplastic syndrome: associated with a neuroblastoma in 20% to 50% of cases
- Myoclonic jerks (sudden muscle contractions) occur in the extremities.
- Chaotic eye movements (opsoclonus) occur in all directions.
- Neuroblastomas commonly metastasize to the skin and bones. Approximately 70% of patients have metastases at the time of diagnosis.
- Prognosis depends on age. Children <1 year old have a good prognosis.

17. HIV affects which of the following most commonly?

a. Helper cells
b. Suppressor cell
c. RBCs
d. Platelets

Ans: a

HIV infects white blood **cells** in the body's immune system called **T-helper cells** (or CD4 **cells**). The virus attaches itself to the **T-helper cell**; it then fuses with it, takes control of its DNA, replicates itself and releases more **HIV** into the blood.

18. Hemoglobin H disease is caused by deletion of:

a. A single a globin gene
b. Two a globin genes
c. Three a globin genes
d. All four a globin genes

Ans: c

Ref: Robbins Basic Pathology 10th Edition, Page No: 448

Table 12.3 Clinical and Genetic Classification of Thalassemias

Clinical Syndrome	Genotype	Clinical Features	Molecular Genetics
β-Thalassemias			Mainly point mutations that lead to defects in the transcription, splicing, or translation of β-globin mRNA
β-Thalassemia major	Homozygous β-thalassemia (β^0/β^0, β^+/β^+, β^0/β^+)	Severe anemia; regular blood transfusions required	
β-Thalassemia intermedia	Variable (β^0/β^+, β^+/β^+, β^0/β, β^+/β)	Moderately severe anemia; regular blood transfusions not required	
β-Thalassemia minor	Heterozygous β-thalassemia (β^0/β, β^+/β)	Asymptomatic with mild or absent anemia; red cell abnormalities seen	
α-Thalassemias			Mainly gene deletions
Silent carrier	–/α, α/α	Asymptomatic; no red cell abnormality	
α-Thalassemia trait	–/–, α/α (Asian) –/α, –/α (black African, Asian)	Asymptomatic, like β-thalassemia minor	
HbH disease	–/–, –/α	Severe; resembles β-thalassemia intermedia	
Hydrops fetalis	–/–, –/–	Lethal in utero without transfusions	

HgH, Hemoglobin H; *mRNA*, messenger ribonucleic acid.

19. Which tumor most commonly metastasize to nervous system?

a. Sarcoma
b. Carcinoma

c. Teratoma
d. Malignant teratoma

Ans: b
Ref: Robbins Basic Pathology 10th Edition, Page No: 887
Tumors of the central nervous system

- Tumors of the CNS may arise from the cells of the coverings (meningiomas), the brain (gliomas, neuronal tumors, choroid plexus tumors), or other CNS cell populations (primary CNS lymphoma, germ cell tumors), or they may originate elsewhere in the body (metastases).
- Even low-grade or benign tumors can have poor clinical outcomes, depending on where they occur in the brain.
- Distinct types of tumors affect specific brain regions (e.g., cerebellum for medulloblastoma, an intraventricular location for central neurocytoma) and specific age populations (medulloblastoma and pilocytic astrocytomas in pediatric age groups, and glioblastoma and lymphoma in older patients).
- Glial tumors are broadly classified into astrocytomas, oligodendrogliomas, and ependymomas. Increasing tumor malignancy is associated with more cytologic anaplasia, increased cell density, necrosis, and mitotic activity.
- Metastatic spread of brain tumors to other regions of the body is rare, but the brain is not comparably protected against the spread of distant tumors. Carcinomas are the dominant type of systemic tumors that metastasize to the nervous system.

20. Enamel like superstructure is seen in which CNS lesion?

a. Craniopharyngioma
b. Pituitary tumour
c. Astrocytoma
d. Glioma

Ans: a

Craniopharyngioma

- Benign brain tumor arising from Rathke pouch
- Pathogenesis
  - derived from remnants of Rathke pouch
  - benign on histology
  - slow growing
  - malignant behavior with invasion in local structures
    - may recur after resection
    - metastases rare
  - blood supply typically from anterior circulation of brain
  - tumor characteristics include dystrophic calcification, cyst formation, and hemorrhage
- Epidemiology
  - most common childhood supratentorial tumor
  - bimodal distribution
    - children 5-14 years
    - adults 65-74 years

Presentation

- Symptoms/physical exam
  - most commonly headaches
    - progressive, dull, and continuous
    - papilledema from increased intracranial pressure
  - bitemporal hemianopia
    - recall pituitary adenomas present similarly
    - from compression of optic chiasm
  - can compress pituitary gland and cause hypopituitarism
    - hypothyroidism
      - nonpitting edema
      - slow return phase of DTR
      - weight gain
      - fatigue
    - adrenal failure
      - orthostatic hypotension
      - hypoglycemia
      - hyperkalemia
    - diabetes insipidus
      - frequent urination

21. Which of the following conditions increases the risk of digoxin toxicity?

a. Administration of quinidine
b. Hyperkalemia
c. Hypermagnesemia
d. Hypocalcemia

Ans: a
Ref: KDT Pharmacology 7th Edition, Page No: 516
Hypokalemia: enhances digitalis toxicity.
Lidocaine i.v. repeated as required is the drug of choice. It suppresses the excessive automaticity, but does not accentuate A-V block. **Quinidine, procainamide and propafenone are contraindicated.**
However, gastrointestinal and cardiac toxicity, which closely resemble digitalis toxicity, often occur when quinidine causes the serum digoxin concentration to rise. These effects subside when the digoxin dose is reduced.

22. Which of the following antihypertensives causes sedation:

a. Clonidine
b. Hydralazine
c. Losartan
d. Amlodipine

Ans: a
Ref: KDT Pharmacology 7th Edition, Page No: 565
Clonidine

- It is an imidazoline derivative having complex actions.

- Clonidine is a partial agonist with high affinity and high intrinsic activity at α2 receptors, especially α2A subtype in brainstem.
- The major haemodynamic effects result from stimulation of α2A receptors present mainly postjunctionally in medulla (vasomotor centre).
- Side effects with clonidine are relatively common.
    - Sedation, mental depression, disturbed sleep; dryness of mouth, nose and eyes (secretion is decreased by central action), constipation (antisecretory effect on the intestines).
    - Impotence, salt and water retention, bradycardia.
    - Postural hypotension occurs, but is mostly asymptomatic.
    - Alarming rise in BP, in excess of pretreatment level, with tachycardia, restlessness, anxiety, sweating, headache, nausea and vomiting occur in some patients when doses of clonidine are missed for 1–2 days.

23. Therapeutic plasma level of digoxin is:

a. 0.1-0.3 ng/ml
b. 0.8-1.5 ng/ml
c. 1.2 to 2 ng/ml
d. More than 2.4 ng/ml

Ans: b
Ref: KDT Pharmacology 7th Edition, Page No: 515

TABLE 37.1 Pharmacokinetic features of digoxin

		DIGOXIN
1.	Oral absorption	60–80%
2.	Plasma protein binding	25%
3.	Time course of action*	
	–Onset	15–30 min
	–Peak	2–5 hr
	–Duration	2–6 days
4.	Plasma t½	40 hr
5.	Therapeutic concn.	0.5–1.4 ng/ml
6.	Toxic concn.	> 2 ng/ml
7.	Daily maintenance dose	0.125–0.5 mg
8.	Daily elimination**	35%
9.	Route of elimination (predominant)	Renal excretion
10.	Route of administration	Oral, i.v.

* Of full digitalizing dose given i.v.; ** fraction of total amount present in the body.

24. Which is the fastest calcium lowering agent?

a. Calcitonin
b. Plicamycin
c. Etidronate

d. Zoledronate

Ans: a
Ref: KDT Pharmacology 7th Edition, Page No: 335, 339, 340
Calcitonin directly inhibits osteoclast function and probably enhances osteoblastic new bone formation.
Calcitonin is the hypocalcaemic hormone.
The actions of calcitonin are generally opposite to that of PTH. It inhibits bone resorption by direct action on osteoclasts—decreasing their ruffled surface which forms contact with the resorptive pit. Whether it also promotes calcium deposition by osteoblasts is not certain. The hypocalcaemic action of calcitonin lasts ~8 hours.

Influences affecting bone turnover

↑ *Resorption*	↓ *Resorption*
Corticosteroids	Androgens/Estrogens
Parathormone	Calcitonin
Thyroxine (excess)	Growth hormone
Hypervitaminosis D	Bisphosphonates
Prostaglandin E_2	Fluoride
Interleukin 1 & 6	Gallium nitrate
Alcoholism	Mithramycin
Loop diuretics	Thiazide diuretics

25. Which of the following drugs binds to albumin?

a. Penicillin
b. Lidocaine
c. Propanolol
d. Verapamil

Ans: a
Ref: KDT Pharmacology 7th Edition, Page No: 19

Drugs highly bound to plasma protein

To albumin	*To α_1-acid glycoprotein*
Barbiturates	β-blockers
Benzodiazepines	Bupivacaine
NSAIDs	Lidocaine
Valproic acid	Disopyramide
Phenytoin	Imipramine
Penicillins	Methadone
Sulfonamides	Prazosin
Tetracyclines	Quinidine
Tolbutamide	Verapamil
Warfarin	

(Remember this list)

26. Atropine does not cause:

a. Increase bowel sound
b. Decrease bowel sound
c. Dryness
d. Tachycardia

Ans: a
Ref: KDT Pharmacology 7th Edition, Page No: 120
Belladonna poisoning may occur due to drug overdose or consumption of seeds and berries of belladonna/datura plant. Children are highly susceptible. Manifestations are due to exaggerated pharmacological actions.
Atropine is an anticholinergic drug. Its toxicity causes:

- Dry mouth (and not excessive salivation)
- Hot skin
- Dilated pupil and photophobia
- Excitement
- Flushing of skin
- Hypotension → cardiovascular collapse
- Convulsions and coma

27. First generation beta blocker is:

a. Metoprolol
b. Atenolol
c. Labetalol
d. Timolol

Ans: d
Ref: KDT Pharmacology 7th Edition, Page No: 144

Another system classifies β blockers into 3 generations.

First generation (older, nonselective)	Second generation (β_1 selective)	Third generation (with additional α blocking and/or vasodilator property)
Propranolol	Metoprolol	Labetalol
Timolol	Atenolol	Carvedilol
Sotalol	Acebutolol	Celiprolol
Pindolol	Bisoprolol	Nebivolol
	Esmolol	Betaxolol

28. Antihistaminic used in motion sickness is:

a. Cetirizine
b. Meclizine
c. Diphenhydramine
d. Fexofenadine

Ans: c
Ref: KDT Pharmacology 7th Edition, Page No: 168

Promethazine, diphenhydramine, dimenhydrinate and meclozine have prophylactic value in milder types of motion sickness; should be taken one hour before starting journey.
Promethazine can also be used in morning sickness, drug induced and postoperative vomiting, radiation sickness.

29. Longest acting nitroglycerine preparation is:

a. Glyceryl trinitrate
b. Amyl nitrite
c. Penta erythrital tetranitrate
d. GTN

Ans: c
Ref: KDT Pharmacology 7th Edition, Page No: 540
Anti-anginal drug classification:

A. Nitrates
    a. Short acting: Glyceryl trinitrate (GTN, Nitroglycerine)
    b. Long acting: Isosorbide dinitrate (short acting by sublingual route), Isosorbide mononitrate, Erythrityl tetranitrate, Pentaerythritol tetranitrate
B. β Blockers: Propranolol, Metoprolol, Atenolol and others.
C. Calcium channel blockers
    a. Phenyl alkylamine: Verapamil
    b. Benzothiazepine: Diltiazem
    c. Dihydropyridines: Nifedipine, Felodipine, Amlodipine, Nitrendipine, Nimodipine, Lacidipine, Lercanidipine, Benidipine
D. Potassium channel opener Nicorandil
E. Others Dipyridamole, Trimetazidine, Ranolazine, Ivabradine, Oxyphedrine

30. Most potent mineralocorticoid is:

a. Aldosterone
b. DOCA
c. Fludrocortisone
d. Triamcinolone

Ans: a
Ref: KDT Pharmacology 7th Edition, Page No: 289
Aldosterone is most potent mineralocorticoid whereas betamethasone is most potent glucocorticoid.

TABLE 20.1 Relative activity of systemic corticosteroids

			Compound	Gluco	Mineralo	Equiv. dose (antiinflammatory)
GLUCOCORTICOIDS	Short acting (Biological t½ < 12 hr)	1.	Hydrocortisone (cortisol)	1	1	20 mg
	Intermediate acting (Biological t½ 12–36 hr)	2.	Prednisolone	4	0.8	5 mg
		3.	Methyl-prednisolone	5	0.5	4 mg
		4.	Triamcinolone	5	0	4 mg
		5.	Deflazacort	3–4	0	6 mg
	Long acting (Biological t½ > 36 hr)	6.	Dexamethasone	25	0	0.75 mg
		7.	Betamethasone	25	0	0.75 mg
MINERALO-CORTICOIDS						Equiv. salt retaining dose
		8.	Desoxycortico-sterone acetate (DOCA)	0	100	2.5 mg (sublingual)
		9.	Fludrocortisone	10	150	0.2 mg
		10.	Aldosterone	0.3	3000	not used clinically

31. Glucocorticoid activity of DOCA is:

a. 0
b. 0.8
c. 1
d. 100

Ans: a
(Please refer explanation of Q no 30)

32. Lamotrigine has common side effects of:

a. Rash
b. Irritability
c. Nephrotoxicity
d. Behavioral disturbances

Ans: a
Ref: KDT Pharmacology 7th Edition, Page No: 419
Lamotrigine

- A new anticonvulsant having carbamazepine-like action profile: modifies maximal electroshock and decreases electrically evoked as well as photic after-discharge duration.
- Prolongation of Na+ channel inactivation and suppression of high frequency firing has been demonstrated.
- Side effects are sleepiness, dizziness, diplopia, ataxia and vomiting. In some comparative trials lamotrigine has been found to be better tolerated than carbamazepine or phenytoin.
- Negative effect on cognitive function is not reported.
- Rash may be a severe reaction, particularly in children, requiring withdrawal.

33. The most suitable tetracycline for use in a patient with impaired renal function is:

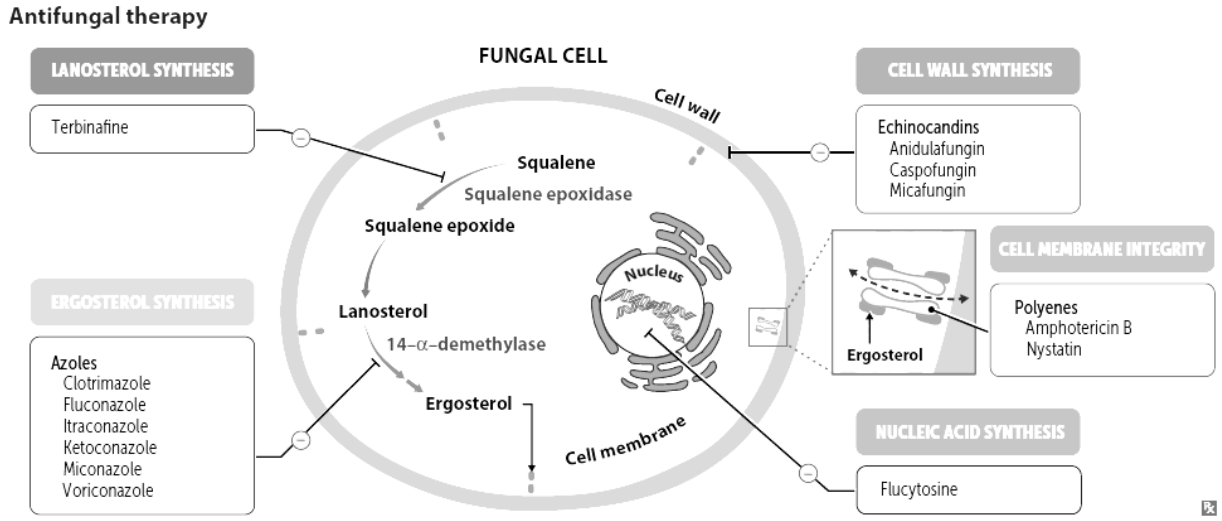
a. Tetracycline

b. Demeclocycline
c. Oxytetracycline
d. Doxycycline

Ans: d
Ref: KDT Pharmacology 7th Edition, Page No: 735
Most tetracyclines are primarily excreted in urine by glomerular filtration; dose has to be reduced in renal failure; doxycycline is an exception to this. They are partly metabolized and significant amounts enter bile—some degree of enterohepatic circulation occurs.
They are secreted in milk in amounts sufficient to affect the suckling infant.

34. Mechanism of action of terbinafine is?
a. Binds to ergosterol
b. Prevents formation of purine
c. Inhibition of microtubule formation
d. Inhibition of ergosterol synthesis

Ans: d
Ref: USMLE Step 1 First Aid 2020, Page No: 198



35. Round worm infection is best treated with:
a. Metronidazole
b. Mebendazole
c. Albendazole
d. Pyrantel pamoate

Ans: c
Ref: KDT Pharmacology 7th Edition, Page No: 850

TABLE 61.1 Choice of drugs for helminthiasis

Worm	First choice drugs	Alternative drugs
1. **ROUNDWORM**		
Ascaris lumbricoides	Mebendazole, Albendazole, Pyrantel	Piperazine, Levamisole Ivermectin
2. **HOOKWORM**		
Ancylostoma duodenale	Pyrantel, Mebendazole, Albendazole	Levamisole
Necator americanus	Mebendazole, Albendazole	Pyrantel
3. **PIN WORM** *Enterobius (Oxyuris) vermicularis*	Pyrantel, Mebendazole, Albendazole	Piperazine
4. **THREAD WORM** *Strongyloides stercoralis*	Ivermectin	Albendazole
5. **WHIPWORM** *Trichuris trichiura*	Mebendazole	Albendazole
6. *Trichinella spiralis*	Albendazole	Mebendazole
7. **FILARIA** *Wuchereria bancrofti, Brugia malayi*	Diethyl carbamazine, Ivermectin	Albendazole
8. **GUINEAWORM** *Dracunculus medinensis*	Metronidazole	Mebendazole
9. **TAPEWORMS**		
Taenia saginata	Praziquantel, Niclosamide	Albendazole
Taenia solium	Praziquantel	Niclosamide, Albendazole
Hymenolepis nana	Praziquantel	Niclosamide, Nitazoxanide
Neurocysticercosis	Albendazole	Praziquantel
10. **HYDATID DISEASE**		
Echinococcus granulosus,	Albendazole	Mebendazole
E. multilocularis	Albendazole	

36. Which of the following drug is contraindicated in pregnancy?

a. Enalapril
b. Amlodipine
c. b-blockers
d. Propylthiouracil

Ans: a
Ref: KDT Pharmacology 7th Edition, Page No: 502
Ref: USMLE Step 1 First Aid 2020, Page No: 610
Enalapril

- This is the second ACE inhibitor to be introduced. It is a prodrug, deesterified in the liver to enalaprilat (a tripeptide analogue), which is not used as such orally because of poor absorption, but is marketed as injectable preparation in some countries.
- Has a longer duration of action: most hypertensives can be treated with single daily dose.
- Rashes and loss of taste are probably less frequent.
- Adverse effects: Cough, Angioedema (both due to increased bradykinin; contraindicated in C1 esterase inhibitor deficiency), Teratogen (fetal renal malformations), Increased Creatinine (decreased GFR), Hyperkalemia, and

Hypotension. Used with caution in bilateral renal artery stenosis because ACE inhibitors will further decrease GFR Leading to renal failure.

37. Urgent treatment of procainamide toxicity is:

a. Calcium chelation
b. KCl
c. Nitroprusside
d. Sodium lactate

Ans: d
Pressor agents (to reverse hypotension) and sodium lactate (to reverse arrhythmias) are indicated for the treatment of procainamide toxicity.

38. Drugs that can be used to treat infections caused by Bacteroides fragilis are all except:

a. Metronidazole
b. Trovafloxacin
c. Vancomycin
d. Amikacin

Ans: d
Drugs used to treat anaerobic organisms include:

- Metronidazole
- Moxifloxacin and Trovafloxacin
- Vancomycin
- Clindamycin
- Chloramphenicol

Aminoglycosides are ineffective against anaerobic organisms.

39. Dysphoria caused by opiates is mediated by which receptor?

a. mu
b. kappa
c. delta
d. sigma

Ans: b
Ref: KDT Pharmacology 7th Edition, Page No: 479

TABLE 34.1 **Actions ascribed to different types of opioid receptors**

μ (mu)	*κ (kappa)*	*δ (delta)*
Analgesia (supraspinal μ_1 + spinal μ_2)	Analgesia (spinal κ_1) (supraspinal-κ_3)	Analgesia (spinal + affective component of supraspinal)
Respiratory depression (μ_2)	Respiratory depression (lower ceiling)	Respiratory depression
Sedation	Dysphoria, psychotomimetic	Affective behaviour
Euphoria	Miosis (lower ceiling)	Reinforcing actions
Miosis	Sedation	Reduced g.i. motility
Muscular rigidity	Physical dependence (nalorphine type)	Proconvulsant
Reduced g.i. motility (μ_2)	Reduced g.i. motility	
Physical dependence (morphine type)		

40. Leucovorin rescue is related to:

a. Methotrexate toxicity
b. Cyclophosphamide toxicity
c. Oncovin toxicity
d. Cisplatin toxicity

Ans: a
Ref: KDT Pharmacology 7th Edition, Page No: 611
Folinic acid (Leucovorin, citrovorum factor, 5-formyl-THFA) is an active coenzyme form which does not need to be reduced by DHFRase before it can act.
Methotrexate is a DHFRase inhibitor; its toxicity is not counteracted by folic acid, but antagonized by folinic acid (3.0 mg i.v. repeated as required).

41. Which of the following is a holocrine gland?

a. Sweat gland
b. Breast
c. Pancreas
d. Sebaceous gland

Ans: d
Ref: Di Fiore's histology 7th Edition, Page No: 130
Classification of exocrine glands based on types of secretory process:

- Merocrine glands:

Release their secretion by exocytosis without any loss of cellular components.
Examples: Sweat glands; secretion of protein casein by mammary gland, pancreas

- Apocrine glands:

Discharge apical part of cell as secretory product
Examples: secretion of milk fat by mammary gland; specialized sweat glands in axilla and perinial area

- Holocrine glands:

Cells themselves become the secretory product
Example: Sebaceous glands

42. Blood supply of posterior compartment of thigh is?

a. Superior gluteal artery

b. Inferior epigastric artery
c. Profunda femoris artery
d. Internal iliac artery

Ans: c
Ref: BDC 7th/e Vol2 p87; Clinical anatomy 3rd Edition, Page No: 319
Profunda femoris artery is the largest branch of femoral artery and supplies all 3 compartments of thigh (anterior, medial and posterior). It arises from the lateral side of femoral artery about 4cm below the inguinal ligament.

43. Angular vein infection causes thrombosis in?

a. Cavernous sinus
b. Supra-Sagittal sinus
c. Transverse sinus
d. Inferior petrosal sinus

Ans: a
Ref: Gray's anatomy, 41st Edition; Chapter 29
The upper most segment of the facial vein, above its junction with the superior labial vein is also called the angular vein. Any infection of the mouth or face can spread via the angular veins to the cavernous sinuses resulting in thrombosis.

44. Central tendon of diaphragm develops from?

a. Septum transversum
b. Dorsal mesocardium
c. Pleuroperitoneal membrane
d. Cervical myotomes.

Ans: a
Ref: Gray's 41st Edition, Page No: 1014-1015; Langman's 11th Edition, Page No: 159-62
Development of diaphragm:
Diaphragm develops from 4 structures derived from mesoderm which unite to form a sheet.

- Septum transversum: gives origin to sterna part and central tendinous region
- Pleuroperitoneal membrane Dorsal paired portion.
- Dorsal mesentery of esophagus gives origin to crural part (dorsal unpaired portion)
- Lateral body walls (from cervical myotome) gives origin to peripheral costal portion of diaphragm.

45. Muscle attached to medial lip of Linea aspera of Femur:

a. Short head of biceps femoris
b. Vastus lateralis
c. Vastus intermedius
d. Vastus medialis

Ans: d
Ref: Gray's anatomy, 41st Edition
Attachments of linea aspera are:

- Lateral lip: Vastus lateralis (in upper half), short head of biceps femoris, lateral intermuscular septum

- Medial lip: Vastus medialis, medial intermuscular septum.
- 3 adductors: Adductor longus, brevis, and magnus.

46. Insertion of extensor carpi ulnaris?

a. Base of proximal phalanx of thumb
b. Base of distal phalanx of thumb
c. Base of 5th metacarpal
d. Scaphoid base

Ans: c
Ref: BDC 7th/e Vol I
Extensor Carpi ulnaris:

- Origin: lateral epicondyle of humerus and posterior border ulna
- Insertion : Base of 5th metacarpal
- Nerve supply: posterior interosseus nerve
- Action: extension (dorsiflexion) and adduction of hand

47. 3rd and 4th lumbrical (lateral two lumbricals) of foot are supplied by?

a. Medial plantar nerve
b. Lateral plantar nerve
c. Peroneal nerve
d. None of the above

Ans: b
Behind the medial malleolus, beneath the flexor retinaculum the tibial nerve divides into its two terminal branches:

- Medial plantar nerve: supplies medial part of sole, plantar surface of medial 3 and half digits and innervates flexor digitorum brevis, abductor hallucis, flexor hallucis brevis and the first lumbrical
- Lateral plantar nerve: supplies lateral part of sole, plantar surface of lateral 1 and half digits and innervates flexor digitorum , abductor digiti minimi, flexor digiti minimi brevis, abductor hallucis all interossei and 2nd, 3rd,4th lumbricals.

48. Gerlach's valve is present in?

a. Gall bladder
b. Nasolacrimal duct
c. Pancreatic duct
d. Vermiform appendix

Ans: d
Ref: Samar Mitra Vol1 p101
Gerlach's valve (Valvula processus vermiformis) is a fold of mucous membrane found at opening of vermiform appendix of some people.

49. Lateral cleft lip is due to failure of fusion of?

a. Maxillary processes
b. Medial nasal processes
c. Medial and lateral nasal process

d. Medial nasal and maxillary process

Ans: d
Ref: Langman's embryology 9th Edition, Page No: 763-65
Central (midline) upper cleft lip occurs due to failure of fusion of two medial nasal process
Lateral upper cleft lip occurs due to failure of fusion central part (medial nasal processes or intermaxillary segment) with lateral part (maxillary process)

50. Meralgia paresthetica is due to involvement of?

a. Medial cutaneous nerve of thigh
b. Lateral cutaneous nerve of thigh
c. Sural nerve
d. Femoral nerve

Ans: b
Ref: Maheshwari 4t Edition, Page No: 296; Harrison's 17th Edition, Page No: 14
Meralgia paresthetica consists of a pain, tingling & numbness without weakness in the lateral aspect of thigh that is supplied by lateral cutaneous nerve of thigh.

51. A change in the third nucleotide of a codon is likely to produce which type of mutation?

a. Frameshift mutation
b. Missense mutation
c. Nonsense mutation
d. Silent mutation

Ans: d
Ref: Harper's Biochemistry, 30th edition, page 416 – 417

- Single base change mutation in the mRNA will have the following effects:
  - Silent mutation: There may be no detectable effect because of the degeneracy of the code. This would be most likely if the changed base in mRNA molecule were to be at the third nucleotide of a codon. Because of wobble, the translation of a codon is least sensitive to a change at the third position.
  - A missense effect will occur when a different amino acid is incorporated at the corresponding site in the protein molecule. This mistaken amino-acid – or missense, depending upon its location in the specific protein – might be acceptable, partially acceptable, or unacceptable to the function of that protein molecule.
  - A nonsense codon may appear that would then result in the premature termination of translation and the production of only a fragment of the intended protein molecule. The probability is high that a prematurely terminated protein molecule or peptide fragment will not function in its normal role.
- Frameshift mutations result from deletion or insertion of nucleotides in DNA that generates altered mRNAs. The deletion of a single nucleotide from the coding strand of a gene results in an altered reading frame in the mRNA.

52. How many ATPs are produced per turn of TCA cycle?

a. 8
b. 10

c. 11
d. 12

Ans: b
Ref: Harper's Biochemistry, 30th edition, page 164

- Ten ATP are formed per turn of citric acid cycle.
- As a result of oxidations catalyzed by the dehydrogenases of the TCA cycle, 3 molecules of NADH and one of $FADH_2$ are produced for each molecule of acetyl-CoA catabolized in one turn of the cycle.
- These reducing equivalents are transferred to the respiratory chain, where reoxidation of each NADH results in formation of ~2.5 ATP, and of FADH2, ~1.5 ATP.
- In addition, 1 ATP (or GTP) is formed by substrate-level phosphorylation catalyzed by succinate thiokinase.

53. Which among the following is a marker for peroxisome?

a. Acid phosphatase
b. Galactosyl transferase
c. Glutamate dehydrogenase
d. Uric acid oxidase

Ans: d
Ref: Satyanarayana Biochemistry, 4th edition, page 103

- Markers for various intracellular organelles are as follow:
  - Plasma membrane: Na^+K^+ATPase, 5' nucleotidase
  - Cytoplasm: Lactate dehydrogenase
  - Mitochondria: Glutamate dehydrogenase
  - Endoplasmic reticulum: Glucose-6-phosphatase
  - Lysosome: Acid phosphatase
  - Golgi bodies: Galactosyl transferase
  - Peroxisome: Catalase, Uric acid oxidase
  - Nucleus: DNA
  - Ribosome: RNA

54. Glycogen synthase I activated by?

a. Insulin
b. Glucagon
c. Epinephrine
d. AMP

Ans: a
Ref: Harper 30th Edition, Page No: 159-161; Lehinger 5th/e 603-04

Enzyme	Activator	Inactivator
Glycogen synthase	Insulin	GLUCAGON (IN LIVER) Epinephrine (in Liver & muscle)
Glycogen phosphorylase	Glucagon (in Liver) Epinephrine (muscle)	Insulin

55. In pyridoxine deficiency, tryptophan is converted to?

a. Nicotine
b. Acetoacetate
c. Xanthurenic acid
d. Acetyl CoA

Ans: c
Ref: Dinesh Puri 3rd Edition, Page No: 378
In vitamin B6 deficiency the metabolism is shunted to xanthurenic acid. Therefore, xanthurenic acid excretion is increased in urine

56. Bile salt help in absorption of fat by?

a. Micelles formation
b. Activation of transporter protein
c. Creation of concentration gradient
d. All of the above

Ans: a
Ref: Ganong physiology 25th Edition, Page No: 465
Emulsification is the process which breaks down ingested fats (mainly triglycerides) into smaller droplets so that they can b digested more efficiently. Thus emulsification mainly helps in digestion of ingested fats.
Micelles formation is the process in which digested fats (FFAs and monoglyceride) are incorporated into much smaller droplets (micelles) so that they can be absorbed more efficiently. Thus micelles formation helps in absorption of digested fats.

57. Hyperammonemia type I is due to deficiency of?

a. CPS-I
b. CPS-II
c. Arginase
d. Arginosuccinase

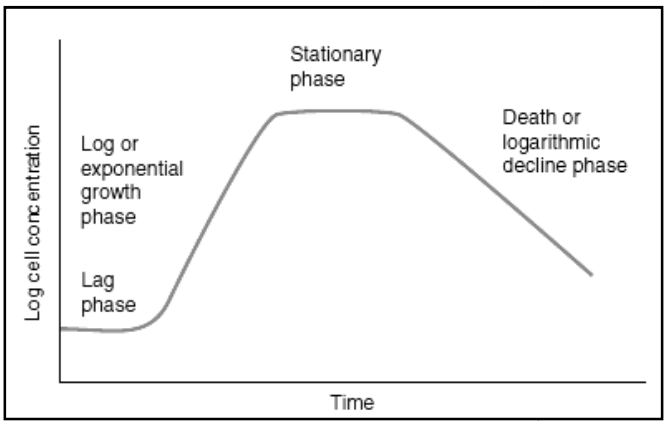
Ans: a
Ref: Harper 30th Edition, Page No: 278
Deficiency of any urea cycle enzyme would result in hyperammonemia.

Disorders	Defective enzyme	Products accumulated
Hyperammonemia type –I	Carbamoyl phosphate synthase I Ornithine transcarbamoylase	Ammonia
Hyperammonemia type-II	Arginosuccinate synthase	Ammonia
Citrullinemia	Argininosuccinate lyase	Citrulline
Arginosuccinic aciduria	Arginase	Argininosuccinate
Argininemia		Arginine

58. Correct sequence of bacterial growth curve:

a. Log phase – Lag Phase – Stationary phase – Decline phase
b. Lag Phase – Log phase – Stationary phase – Decline phase
c. Stationary phase – Log phase – Lag Phase – Decline phase
d. Lag phase – Exponential phase – Log phase – Death phase

Ans: b
Ref: Jawetz Microbiology 27th Edition, Page No: 57



Phase	Growth Rate
Lag	Zero
Exponential	Constant
Maximum stationary	Zero
Decline	Negative (death)

Fig: Bacterial growth curve

59. Phage mediate transfer of cDNA into host is known as:

a. Transduction
b. Transformation
c. Transmission
d. Conjugation

Ans: a
Ref: Jawetz Microbiology 27th Edition, Page No: 107, 108
Conjugation requires donor cell-to-recipient cell contact to transfer only one strand of DNA. The recipient completes the structure of double-stranded DNA by synthesizing the strand that complements the strand acquired from the donor.
In transduction, donor DNA is carried in a phage coat and is transferred into the recipient by the mechanism used for phage infection.
Transformation, the direct uptake of "naked" donor DNA by the recipient cell, may be natural or forced. Forced transformation is induced in the laboratory, where, after treatment with high salt and temperature shock, many bacteria are rendered competent for the uptake of extracellular plasmids. The capacity to force bacteria to incorporate extracellular plasmids by transformation is fundamental to genetic engineering.

60. Which IgG can cross placenta most efficiently?

a. IgG1
b. IgG2
c. IgG3
d. IgG4

Ans: a

Ref: Jawetz Microbiology 27th Edition, Page No: 126, 135

	IgG	IgA	IgM	IgD	IgE
Heavy chain symbol	γ	α	μ	δ	ε
Valence	2	4[a]	5	2	2
Molecular weight (daltons)	143,000-160,000	159,000-447,000[a]	900,000	177,000-185,000	188,000-200,000
Serum concentration (mg/ml)(adult)	8–16	1.4–4.0	0.4–2.0	0.03	Trace amounts
Serum half-life (days)	21[b]	7	7	2	2
Percentage of total immunoglobulins in serum	80	15	5	0.2	0.002
Complement fixing capacity	Yes (+)	No	Yes (++)	No	No
Placental transfer to fetus [c]	+	–	–	–	–

[a] In secretions, eg, saliva, milk, and tears and in respiratory, intestinal, and genital tract secretions, IgA is generally found as a dimer or a tetramer but in serum IgA exists primarily as a monomer.

[b] Subclasses 1,2,4. Subclass 3 has half-life of 7 days.

[c] Primarily subclasses IgG1 and IgG3, but all the subclasses have been detected.

- Placental transfer to fetus: Primarily subclasses IgG1 and IgG3, but all the subclasses have been detected
- IgG1 is 65% of the total IgG. IgG2 is directed against polysaccharide antigens and may be an important host defense against encapsulated bacteria. IgG3 is an effective activator of complement due to its rigid hinge region, while IgG4 does not activate complement due to its compact structure.

61. Which Immunoglobulin has maximum percentage of total immunoglobulin in serum?

a. IgG
b. IgA
c. IgM
d. IgD

Ans: a
(Please refer question number 60 for explanations).

62. Acromegaly is due to excess of:

a. Somatomedin
b. Growth hormone
c. Somatostatin
d. Insulin

Ans: b
Ref: Ganong Physiology 24th Edition, Page No: 328
Gigantism & Acromegaly

- Tumors of the somatotropes of the anterior pituitary (pituitary adenoma) secrete large amounts of growth hormone, leading to gigantism in children and to acromegaly in adults.
- If the tumor arises before puberty, the individual may grow to an extraordinary height. After linear growth is no longer possible, on the other hand, the characteristic features of acromegaly arise, including greatly enlarged hands and feet, vertebral changes attributable to osteoarthritis, soft tissue swelling, hirsutism, and protrusion of the brow and jaw.

- Abnormal growth of internal organs may eventually impair their function such that the condition, which has an insidious onset, can prove fatal if left untreated.
- Hypersecretion of growth hormone is accompanied by hypersecretion of prolactin in 20–40% of patients with acromegaly.
- About 25% of patients have abnormal glucose tolerance tests, and 4% develop lactation in the absence of pregnancy.
- Acromegaly can be caused by extra-pituitary as well as intrapituitary growth hormone-secreting tumors and by hypothalamic tumors that secrete GHRH, but the latter are rare.

63. What percentage of oxygen is carried from lungs to the tissues by hemoglobin?

a. 97%
b. 80%
c. 65%
d. 21%

Ans: a
Ref: Guyton and Hall physiology, 13th edition, Page 530
Normally about 97 percent of the oxygen is transported from the lungs to the tissues is carried in chemical combination with hemoglobin in the red blood cells. The remaining 3 percent is transported in the dissolved state in the water of the plasma and blood cells.

64. Which lung volume/capacity cannot be measured directly using a spirometer:

a. TV
b. VC
c. IRC
d. FRC

Ans: d
Ref: Guyton and Hall physiology, 13th Ed, Page 502-503

- Functional Residual Capacity (FRC) is the volume of air that remains in the lungs at the end of each normal respiration. Because this value changes markedly in some types of pulmonary disease, it is desirable to measure this capacity.
- But the spirometer cannot be directly to measure the FRC because the air in the residual volume of the lungs cannot be expired into the spirometer and this volume constitutes about one half of FRC.
- FRC can however be measured indirectly by helium dilution method.

65. Calcium is Factor:

a. I
b. II
c. III
d. IV

Ans: d
Ref: Ganongs Review of Physiology, 25th Edition, Page 562

Factor[a]	Names
I	Fibrinogen
II	Prothrombin
III	Thromboplastin
IV	Calcium
V	Proaccelerin, labile factor, accelerator globulin
VII	Proconvertin, SPCA, stable factor
VIII	Antihemophilic factor (AHF), antihemophilic factor A, antihemophilic globulin (AHG)
IX	Plasma thromboplastic component (PTC), Christmas factor, antihemophilic factor B
X	Stuart-Prower factor
XI	Plasma thromboplastin antecedent (PTA), antihemophilic factor C
XII	Hageman factor, glass factor
XIII	Fibrin-stabilizing factor, Laki-Lorand factor
HMW-K	High-molecular-weight kininogen, Fitzgerald factor
Pre-Ka	Prekallikrein, Fletcher factor
Ka	Kallikrein
PL	Platelet phospholipid

[a]Factor VI is not a separate entity and has been dropped.

66. Father of Public Health is:

a. Plague
b. Cholera
c. Dysentery
d. ARI

Ans: b
Ref: Park PSM 23rd Edition, Page No: 5
Cholera which is often called the "father of public health" appeared time and again in the western world during the 19th century.
An English epidemiologist, John Snow, studied the epidemiology of cholera in London from 1848 to 1854 and established the role of polluted drinking water in the spread of cholera. In 1856, William Budd, another pioneer, by careful observations of an outbreak of typhoid fever in the rural north of England concluded that the spread was by drinking water, not by miasma and sewer gas.

- Father of Medicine/First True Epidemiologist: Hippocrates
- Father of Public Health: Cholera
- First Country to Socialise Medicine completely: Russia
- Father of Modern Toxicology: Mathieu Orfila
- Father of Modern Anatomy: Andreas Vesalius
- Father of Modern Microbiology: Louis Pasteur
- Father of Antisepsis/ Modern surgery: Joseph Lister

- Father of Bacteriology: Robert Koch
- Father of Biochemistry: Carl Alexander Neuberg
- Father of Biology/ Zoology: Aristotle
- Father of Epidemiology/ Modern Epidemiology, Greatest doctor: John Snow
- Father of Evidence based Medicine: DL Sackett
- Father of Genetics: Gregor Mendel
- Father of Gynecology: J Marion Sims
- Father of Histology: Marie-Francois Xavier Bichat
- Father of Homeopathy: Samuel Hahneman
- Father of Indian Medicine: Charaka
- Father of Modern medicine: William Osler
- Father of Modern/ Microscopic/ Cellular pathology: Rudolf Virchow
- Father of Modern laparoscopy: Camran Nezhat
- Father of Modern microbiology: Louis Pasteur
- Father of Modern pharmacology: Oswald Schmiedeberg
- Father of Obstetric ultrasound Ian Donald
- Father of Sociology: Karl Marx
- Father of Surgery/ Modern surgery: Ambroise Pare

67. 1920-1960 was considered which phase of public health

a. Disease control phase
b. Health promotional phase
c. Social engineering phase
d. "Health for All" phase

Ans: b
Ref: Park PSM 23rd Edition, Page No: 8, 9
Changing concepts in public health
In the history of public health, four distinct phases may be demarcated:

- **Disease control phase (1880-1920)**

Public health during the 19th century was largely a matter of sanitary legislation and sanitary reforms aimed at the control of man's physical environment, e.g., water supply, sewage disposal, etc. Clearly these measures were not aimed at the control of any specific disease, for want of the needed technical knowledge.

- **Health promotional phase (1920-1960)**

At the beginning of the 20th century, a new concept, the concept of "health promotion" began to take shape.
It was realized that public health had neglected the citizen as an individual, and that the State had a direct responsibility for the health of the individual.

- **Social engineering phase (1960-1980)**

With the advances in preventive medicine and practice of public health, the pattern of disease began to change in the developed world. Many of the acute illness problems have been brought under control. However, as old problems were solved, new health problems in the form of chronic diseases began to emerge, e.g., cancer, diabetes, cardiovascular diseases, alcoholism and drug addiction etc. especially in the affluent societies.

- **"Health for All" phase (1981-2000 A.D.)**

As the centuries have unfolded, the glaring contrasts in the picture of health in the developed and developing countries came into a sharper focus, despite advances in medicine. Most people in the developed countries, and the elite of the developing countries, enjoy all the determinants of good health adequate income, nutrition, education, sanitation, safe drinking water and comprehensive health care.

68. "Detection of disturbances of homoeostatic and compensatory mechanism while biochemical, morphological, and functional changes are still reversible" is called:

a. Prevention
b. Screening
c. Early detection
d. Primordial detection

Ans: c
Ref: Park PSM 23rd Edition, Page No: 43
Early diagnosis and treatment

- A WHO Expert Committee defined early detection of health impairment as "the detection of disturbances of homoeostatic and compensatory mechanism while biochemical, morphological, and functional changes are still reversible."
- Thus, in order to prevent overt disease or disablement, the criteria of diagnosis should, if possible, be based on early biochemical, morphological and functional changes that precede the occurrence of manifest signs and symptoms. This is of particular importance in chronic diseases.
- Early detection and treatment are the main interventions of disease control. The earlier a disease is diagnosed and treated the better it is from the point of view of prognosis and preventing the occurrence of further cases (secondary cases) or any long-term disability. It is like stamping out the "spark" rather than calling the fire brigade to put out the fire.

69. Expression of the overall effect of a programme, services or institution on health status and socio-economic development is called:

a. Relevance
b. Impact
c. Effectiveness
d. Efficiency

Ans: b
Ref: Park PSM 23rd Edition, Page No: 883
Elements of evaluation

- **Relevance:** Relevance or requisiteness relates to the appropriateness of the service, whether it is needed at all. If there is no need, the service can hardly be of any value. For example, vaccination against smallpox is now irrelevant because the disease no longer exists.
- **Adequacy:** It implies that sufficient attention has been paid to certain previously determined courses of action. For example, the staff allocated to a certain programme may be described as inadequate if sufficient attention was not paid to the quantum of work-load and targets to be achieved.
- **Accessibility:** It is the proportion of the given population that can be expected to use a specified facility, service, etc. The barriers to accessibility may be physical (e.g., distance, travel, time); economic {e.g., travel cost, fee charged); or social and cultural {e.g., caste or language barrier).

- **Acceptability:** The service provided may be accessible, but not acceptable to all, e.g., male sterilization, screening for rectal cancer.
- **Effectiveness:** It is the extent to which the underlying problem is prevented or alleviated. Thus it measures the degree of attainment of the predetermined objectives and targets of the programme, service or institutign - expressed, if possible, in terms of health benefits, problem reduction or an improvement of an unsatisfactory health situation.

The ultimate measures of effectiveness will be the reduction in morbidity and mortality rates.

- **Efficiency:** It is a measure of how well resources {money, men, material and time) are utilized to achieve a given effectiveness. The following examples will illustrate: the number of immunizations provided in a year as compared with an accepted norm; the percentage of bed occupancy, cost per day in hospital, cost per patient treated, etc.
- I**mpact:** It is an expression of the overall effect of a programme, services or institution on health status and socio-economic development.

70. First step is health education planning is:

a. Collecting information on specific problems as seen by the community
b. Identification of the problem
c. Deciding on priorities
d. Setting goals and measurable objectives

Ans: a
Ref: Park PSM 23rd Edition, Page No: 867
Health education planning follows the main steps in scientific planning, which are :

1. Collecting information on specific problems as seen by the community
2. Identification of the problem
3. Deciding on priorities
4. Setting goals and measurable objectives
5. Assessment of resources
6. Consideration of possible solutions
7. Preparation of a plan of action:
   (i) What will be done?
   (ii) When?
   (iii) By whom?
8. Implementing the plan
9. Monitoring and evaluating the degree to which stated objectives have been achieved
10. Reassessment of the process of planning. Planning and evaluation are essential for effective health education.

71. Hardy-Weinberg law is about:

a. Population genetics
b. Chlorine concentration
c. Occupational risk factors
d. Social medicine

Ans: a
Ref: Park PSM 23rd Edition, Page No: 827

The Hardy-Weinberg law states that "the relative frequencies of each gene allele tends to remain constant from generation to generation" in the absence of forces that change the gene frequencies. Thus, the study of gene frequencies, and the influences which operate to alter the "gene pool" and their long-term consequences is the central theme in population genetics.

72. Anemia, abdominal pain and ulcer are associated commonly with:

a. Lead
b. Silica
c. Solvents
d. Radon

Ans: a
Ref: Park PSM 23rd Edition, Page No: 813

Hazard	*Undesirable conditions*
(1) Lead	Anaemia, hypertension, nephritis, peptic ulcer
(2) Dyes	Asthma; skin, bladder and kidney diseases; precancerous lesions
(3) Solvents	Liver and kidney disease, dermatitis, alcoholism
(4) Silica	Healed or active tuberculosis of lungs, chronic lung disease
(5) Radium and X-rays	Signs of ill-health, especially any blood disease.

73. During emergency situation, safe supply should be ensured for:

a. Water
b. Cloth
c. House
d. Security

Ans: a
Ref: Park PSM 23rd Edition, Page No: 798
The main public safety aspect of water quality is microbial contamination. The first priority of ensuring water quality in emergency situations is chlorination. It is the best way of disinfecting water. It is advisable to increase residual chlorine level to about 0.2-0.5 mg/litre. Low water pressure increases the risk of infiltration of pollutants into water mains. Repaired mains, reservoirs and other units require cleaning and disinfection.

74. Which of the following is not a component of disaster management:

a. Disaster response
b. Disaster preparedness
c. Disaster mitigation
d. Disaster prevention

Ans: d

Ref: Park PSM 23rd Edition, Page No:: 795, 796
There are three fundamental aspects of disaster management:

- disaster response
- disaster preparedness
- disaster mitigation

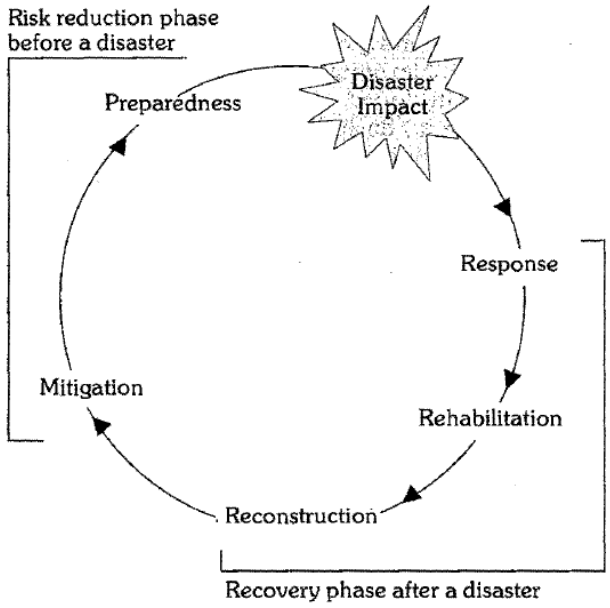


FIG. 1
Management sequence of a sudden-onset disaster

75. Cool and comfortable effective temperature is (in deg C):

a. 20-25
b. 25-27
c. 27-28
d. 28+

Ans: a
Ref: Park PSM 23rd Edition, Page No: 732

		Corrected effective temperature deg C
1. Pleasant and cool	.....	20
2. Comfortable and cool	.....	20–25
3. Comfortable	.....	25–27
4. Hot and uncomfortable	.....	27–28
5. Extremely hot	.....	28 +
6. Intolerably hot	.....	30 +
		Predicted four–hour sweat rate (P_4SR)
1. Comfort zone	.....	1–3 litres
2. Just tolerable	.....	3–4.5 litres
3. Intolerable	.....	4.5 + litres

76. All are "Water-Washed Diseases" except:

a. Scabies
b. Trachoma
c. Typhoid
d. Conjunctivitis

Ans: c

- Water borne diseases: Occur due to drinking contaminated water, transmitted by faeco-oral route

Examples: Typhoid, Cholera, Dysentery, Viral Hepatitis A

- Water washed diseases: Include infections of the outer body surface which occur due to inadequate use of water or improper hygiene

Examples: Scabies, Trachoma, Typhus, Bacillary dysentery, Amoebic dysentery

- Water based diseases: Refers to infections transmitted through an aquatic invertebrate animal

Examples: Schistosomiasis, Dracunculiasis (Guinea worm disease)

- Water related diseases (Water breeding diseases): Are infections spread by insects that depend on water

Examples: Malaria, Filariasis, Dengue, Yellow fever, Onchocerciasis

77. The sewage ground water is disposed by:

a. Oxidation pond
b. Soakage pit
c. Activated sludge process
d. Any of the above

Ans: c

Ref: Park PSM 23rd Edition, Page No: 764

- Activated sludge process is the modern **method of purifying sewage**, in place of the trickling filter.
- The "heart" of the activated sludge process is the **aeration tank**.
- The effluent from the primary sedimentation tank is mixed with sludge drawn from the final settling tank (also known as activated sludge or return sludge; this sludge is a rich culture of aerobic bacteria), The proportion of activated sludge to the incoming effluent is of the order of 20 to 30 per cent.

- The mixture is subjected to aeration in the aeration chamber for about 6 to 8 hours.

78. An upper limit of noise which people can tolerate without damage to their hearing is:

a. 45 dB
b. 65 dB
c. 85 dB
d. 105 dB

Ans: c
Ref: Park PSM 23rd Edition, Page No: 741, 742
Loudness or intensity depends upon the amplitude of the vibrations which initiated the noise. The loudness of noise is measured in decibels (dB).
When we say that sound is 60 dB, it means that it is 60 dB more intense than the smallest distinguishable noise or the "reference" sound pressure, which is understood to be 0.0002 microbar or dynes/cm2 . A dyne is 1/1000,000th of atmospheric pressure.
Normal conversation produces a noise of 60-65 dB; whispering, 20-30 dB; heavy street traffic, 60-80 dB; and boiler factories, about 120 dB.

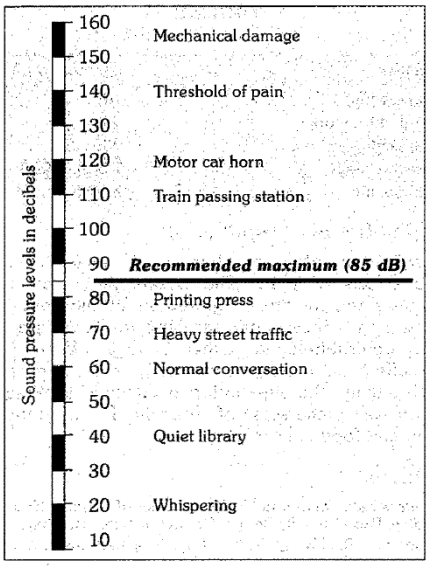


FIG.1
Community noise levels

Acceptable noise levels (dBA)

Residential	Bed room	25
	Living room	40
Commercial	Office	35–45
	Conference	40–45
	Restaurants	40–60
Industrial	Workshop	40–60
	Laboratory	40–50
Educational	Class room	30–40
	Library	35–40
Hospitals	Wards	20–35

79. McArdle's maximum allowable sweat rate is:

a. 4 lit /4 hours
b. 4 lit /1 hours
c. 4.5 lit/4 hours
d. 4.5 lit/8 hours

Ans: c
Ref: Park PSM 23rd Edition, Page No: 732
McArdle’s maximum allowable sweat rate:

- McArdle's and associates took 4.5 litres of sweat excreted in four hours as the maximum allowable sweat rate compatible with physiological normal reaction of acclimatized, healthy young men for repeated exposures to heat.
- They prepared a chart from which the "predicted four hour sweat rate" (P4SR) can be obtained from any combination of dry and wet bulb temperature of the air, mean radiant air temperature and air velocity, under different work intensity.
- McArdle has put P 4SR value of 3 as upper limit of comfort zone.

80. All the following provide evidence of fecal pollution except:

a. Fecal streptococci
b. Coliform
c. Cl. Tetani
d. Enteropathogenic virus

Ans: c
Ref: Park PSM 23rd Edition, Page No: 720, 721
The primary bacterial indicator recommended for this purpose is the coliform group of organisms as a whole.
Supplementary indicator organisms, such as faecal streptococci and sulphite-reducing clostridia, may sometimes be useful in determining the origin of faecal pollution as well as in assessing the efficiency of water treatment processes.
Bacteriological indicators of water quality:

- Coliform (E. coli is most important microbiological indicator)
- Fecal streptococci (Indicator of recent contamination) (Sodium Azide medium)
- Clostridium perfringens (Indicator of remote contamination)
- Acceptable level of coliform in drinking water: None
- EXCEPTION: In large urban supplies, up to 5% samples are acceptable to be contaminated, if taken continuously for a period of 12 month

Bacteriological quality of drinking-water[a]

Organisms	Guideline value
All water intended for drinking	
E.coli or thermotolerant coliform bacteria[b,c]	Must not be detectable in any 100 ml sample
Treated water entering the distribution system	
E.coli or thermotolerant coliform bacteria[b]	Must not be detectable in any 100 ml sample
Total coliform bacteria	Must not be detectable in any 100 ml sample
Treated water in the distribution system	
E.coli or thermotolerant coliform bacteria[b]	Must not be detectable in any 100 ml sample
Total coliform bacteria	Must not be detectable in any 100 ml sample. In the case of large supplies, where sufficient samples are examined, must not be present in 95% of samples taken throughout any 12 month period.

a. Immediate investigative action must be taken if either *E.coli* or total coliform bacteria are detected. The minimum action in the case of total coliform bacteria is repeat sampling; if these bacteria are detected in the repeat sample, the cause must be determined by immediate further investigation.
b. Although *E.coli* is the more precise indicator of faecal pollution, the count of thermotolerant coliform bacteria is an acceptable alternative. If necessary, proper confirmatory tests must be carried out. Total coliform bacteria are not acceptable indicators of the sanitary quality of rural water supplies, particularly in tropical areas where many bacteria of no sanitary significance occur in almost all untreated supplies.
c. It is recognized that, in the great majority of rural water supplies in developing countries, faecal contamination is widespread. Under these conditions, the national surveillance agency should set medium-term targets for progressive improvement of water supplies.

81. Baye's theorem is related to:

a. Probability
b. Specificity
c. PPV
d. NPV

Ans: a
Ref: Mahajan Biostatistics 8th Edition, page No: 144
Bayes' Theorem
Probability: Is the chance that some event will occur
Probability range: 0 to +1 (0% to 100%)

- Probability can never be zero
- Probability cannot exceed one.

82. Sampling method used in assessing immunization sta¬tus of children under immunization program is:

a. Systematic sampling
b. Stratified sampling
c. Group sampling
d. Cluster sampling

Ans: d
Ref: Mahajan Biostatistics 8th Edition, page No: 125

- A cluster is a randomly selected group. This method is used when units of population are natural groups or clusters such as villages, wards, blocks, slums of a town, factories, work-shops or children of a school, etc.
- Fortunately, the technique of cluster sampling allows small number of the target population to be sampled while the data provided is statistically valid at 95% confidence limits (10% variation).
- From the chosen clusters, 30 in number, the entire population is surveyed.
- Cluster sampling gives a higher standard error but the data collection in this method is simpler and involves less time and cost than in other sampling techniques.
- **As per module approved by WHO, it is most often used to evaluate vaccination coverage in expanded Programme of Immunization (EPI) and Universal Immunization Programme (UIP), where only 210 children, taking 7 from each cluster in the age group 12–23 months are to be examined.**

Types of Sampling

	Random Sampling	Non-random sampling
Synonyms	Probability sampling	Non-probability sampling
	Non-purposive sampling	Purposive sampling
Types	Simple random sampling	Convenience sampling
	Systematic random sampling	Quota sampling
	Stratified random sampling	Snow-ball sampling
	Multistage random sampling	Clinical trial sampling
	Multiphase random sampling	
	Cluster random sampling	

Types of Random Sampling
Simple Random Sampling

- Every unit of population has equal and known chance of being selected
- Is also known as 'unrestricted random sampling'
- Applicable for small, homogenous and readily available populations

- Used in clinical trials

Methods of Simple random samplings:

- Lottery method
- Random no. tables
- Computer software

Systematic Random Sampling

- Based on sampling fraction: Every Kth unit is chosen in the population list, where K is chosen by sampling interval
- Sampling Interval (K) Q = Total no. of units in population/ Total no. of units in sample
- Applicable for large, non-homogenous populations where complete list of individuals is available
- For example, if there is a population of 1000 from which sample of 20 is to be chosen, then K = 1000/20 = 50; thus every 50th unit will be included in the sample (i.e. 1st, 51st, 101st, so on...) First unit among first 50 is chosen by simple random sampling.

Stratified Random Sampling

- Non-homogenous population is converted to homogenous groups/classes (strata); sample is drawn from each strata at random, in proportion to its sizes
- Applicable for large non-homogenous population
- Gives more representative sample than simple random sampling
- None of the categories is under or over-represented
- For example, In a population of 1000, sample of 100 is to be drawn for Hemoglobin estimation; first convert non-homogenous population is converted to homogenous strata (i.e. 700 males and 300 females), then draw 70 males and 30 females randomly respectively.

Multistage Random Sampling

- Is done in successive stages; each successive sampling unit is nested in the previous sampling unite
- Advantage: Introduces flexibility in sampling
- For example, in large country surveys, states are chosen, then districts, then villages, then every 10th person in village as final sampling unit

Multiphase Random Sampling

- Is done in successive phases; part of information is obtained from whole sample and part from the sub-samples
- For example, in a TB survey, Mantoux test done in first phase, then X-ray done in all Mantoux positives, then sputum examined in all those with positive X-ray findings.

Cluster Random Sampling

Types of Non-Random Sampling

Convenience Sampling

- Patients are selected, in part or in whole, at the convenience of the researcher; no/limited attempt to ensure that sample is an accurate representation of population
- For example, standing at a shopping mall and selecting shoppers as they walk by to fill out a survey.

Quota Samplings

- Population is first segmented into mutually exclusive sub-groups (quotas), just as in stratified sampling; then judgment is used to select the units from each group non-randomly
- Is a type of convenience sampling.

Snow-ball Samplings

- A technique for developing a research sample where existing study subjects recruit future subjects from among their acquaintances; thus the sample group appears to grow like a rolling snowball
- Is often used in hidden populations which are difficult for researchers to access, e.g. drug users or commercial sex workers.

Clinical Trial Sampling

83. Values are arranged in ascending and descending order to calculate:

a. Mean
b. Mode
c. Median
d. SD

Ans: c
Ref: Mahajan Biostatistics 8th Edition, page No: 37

- Median: When all the observations of a variable are arranged in either ascending or descending order, the middle observation is known as median. It implies the midvalue of series.
- Mean: This measure implies arithmetic average or arithmetic mean which is obtained by summing up all the observations and dividing the total by the number of observations.
- Mode: This is the most frequently occurring observation in a series, i.e. the most common or most fashionable.

84. Standard deviation of means measures:

a. Non-sampling errors
b. Sampling errors
c. Random errors
d. Conceptual errors

Ans: b
Ref: Mahajan Biostatistics 8th Edition, page No: 172

- Frequency distribution of the difference gives a normal curve.
- The standard deviation of such a distribution of differences is known as standard error of difference between two means.
- In practice, it is not possible to find large number of differences in pairs of sample means and then find the SE of these differences.
- The test is applied to one pair directly if standard deviation of means of two samples are known. Assumption of no difference between the two sample means is made as per null hypothesis.

The standard error (SE) of a statistic is the approximate standard deviation of a statistical sample population. The standard error is a statistical term that measures the accuracy with which a sample distribution represents a population by using standard deviation. In statistics, a sample mean deviates from the actual mean of a population—this deviation is the standard error of the mean.

85. Mosquitoes decrease as height increases in:

a. Positive correlation
b. Negative correlation
c. Bidirectional
d. Zero correlation

Ans: b
Ref: Park PSM 23rd Edition, Page No: 852
Correlation:
Is relationship between 2 quantitative or continuous variables

- Degree of relationship
- Direction of relationship

Correlation is represented by: 'Scatter diagram (imaginary lines are drawn along the distribution of dots/ scatter)
Correlation coefficient (r): Measures the degree or strength of relationship in a correlation (Correlation coefficient (r) lies between: -1 to +1 (-1 < r < +1)
Correlation coefficients:

	Pearson's coefficient	**Spearman's coefficient**
Synonym	Product moment Correlation	Rank Correlation
Used for	Ungrouped series	Grouped series
Applicability	When associated variables are	When associated variables are not normally
	normally distributed	distributed
Symbol	'r'	rho (r)'
Domination	Is dominated by linearity	Non-linear and curvilinear relationships

86. LJ chart is used for:

a. Accuracy
b. Precision
c. Odds
d. Likelihood ratio

Ans: a

Tests of accuracy	**Tests of precision**
Mean chart	Range chart
Levy Jennings (U) chart	R - chart .
Stewart control chart	

87. Mean of 17, 19, 24, 33, 11, 9, 2, 4 is:

a. 11
b. 14
c. 17
d. 19

Ans: b
Obvious answer!!

88. In normal curve:

a. Mean = 2 standard deviation
b. Mean = Median
c. Mean = Variance

d. Mean = 1 standard deviation

Ans: b
Ref: Mahajan Biostatistics 8th Edition, page No: 101

- Histogram of the same frequency distribution of heights, with large number of observations and small class interval, gives a frequency curve which is symmetrical in nature. This is called normal curve.
- The frequency distribution is symmetrical around a single peak so that mean, median and mode will coincide.
- It builds up gradually from the smallest frequencies at the extremes of classification to the highest frequency at the peak in the middle.
- This curve is a check on SD to find whether it has been calculated from a random and large sample, representing the universe or not.

The characteristics of a normal curve are:

- It is bell-shaped or like breast.
- It is symmetrical.
- Mean, mode and median coincide.
- It has two inflections. The central part is convex while and the points of inflection, the curve changes from convexity to concavity. A perpendicular from the point of inflection will cut the base at a distance of one SD from the mean on either side.

Types of Distributions

- Normal
  - aka Gaussian, bell-shaped
  - Mean = median = mode
- Bi-modal
  - Distribution has two humps (each being a relative mode)
  - If symmetrical, mean = median
- Skewed
  - Positive Skew
    - Asymmetrical with tail trailing off to right
    - Mean > median > model
  - Negative Skew
    - Asymmetrical with tail trailing off to left
    - Mean < median < mode
  - Mean very sensitive to skew
  - Median somewhat resistant to skew
  - Mode very resistant to skew

89. Most popular media for mass education of general public is:

a. Television
b. Radio
c. Newspaper
d. Internet

Ans: a
Ref: Park PSM 23rd Edition, Page No: 863, 86

Health Communication

Individual approach	Group approach	Mass approach
1. Personal contact	1. Lectures	1. Television
2 Home visits	2. Demonstrations	2. Radio
3. Personal Letters	3. Discussion methods	3. News paper
	– Group discussion	4. Printed material
	– Panel discussion	5. Direct mailing
	– Symposium	6. Posters
	– Workshop	7. Health museums and exhibitions
	– Conferences	8. Folk methods
	– Seminars	9. Internet
	– Role play	

Television has become the most popular of all media. It is effective in not only creating awareness, but also to an extent influencing public opinion and introducing new ways of life.
It is raising levels of understanding and helping people familiarise with things they have not seen before, including crime and vioJence which are shown as part of feature programmes.
TV is a one-way channel. It can only be an aid to teaching. It cannot cover all areas of learning.
It has much potential for health communication.

90. GATHER Approach is useful for:

a. Chlorination of water
b. Counselling
c. Refuse disposal
d. Data analysis

Ans: b
Elements of Counselling: (GATHER Approach)

- G: Greet the clients (make them comfortable, give attention)
- A: Ask/ ascertain needs/ problems or reasons for coming
- T: Telling different methods/ options/ choices to solve the problem
- H: Help client to make voluntary decisions
- E: Explain fully the chosen decision/ action/ method
- R: Return for follow-up visit

91. Best method of teaching an urban slum about ORS is:

a. Lecture
b. Role play
c. Demonstration
d. Flash cards

Ans: c
Ref: Park PSM 23rd Edition, Page No: 864
Demonstrations

- A demonstration is a carefully prepared presentation to show how to perform a skill or procedure. Here a procedure (e.g. lumber puncture, disinfection of a well) is carried out step by step before an audience or the

target group, the demonstrator ascertaining that the audience understands how to perform it. The demonstrator involves the audience in discussion.

- Demonstration (a) dramatizes by arousing interest (b) persuades the onlookers to adopt recommended
- practices (c) upholds the principles of "seeing is believing" and "learning by doing'', and (d) can bring desirable changes in the behaviour pertaining to the use of new practice.
- **Demonstration as a means of communication has been found to have a high educational value in programmes like environmental sanitation (e.g., installation of a hand-pump, construction of a sanitary latrine); mother and child health (e.g. demonstration of oral rehydration technique) and control of diseases (e.g., scapies). The clinical teaching in hospitals is based on demonstrations. This method has a high motivational value.**

92. Total number of colour in Traige is:

a. 1
b. 2
c. 3
d. 4

Ans: d
Ref: Park PSM 23rd Edition, Page No: 796

Triage:

- When the quantity and severity of injuries overwhelm the operative capacity of health facilities, a different approach to medical treatment must be adopted. The principle of "first come, first treated", is not followed in mass emergencies.
- Triage consists of rapidly classifying the injured on the basis of the severity of their injuries and the likelihood of their survival with prompt medical intervention. It must be adopted to locally available skills. Higher priority is granted to victims whose immediate or long-term prognosis can be dramatically affected by simple intensive care. Moribund patients who require a great deal of attention, with questionable benefit, have the lowest priority. Triage is the only approach that can provide maximum benefit to the greatest number of injured in a major disaster situation.
- Although different triage systems have been adopted and are still in use in some countries, the most common classification uses the internationally accepted four colour code system. Red indicates high priority treatment or transfer, yellow signals medium priority, green indicates ambulatory patients and black for dead or moribund patients.

Types of Triage

Triage is of two types:

Simple triage: Simple triage is used in a scene of mass casualty, in order to sort patients into those who need critical attention and immediate transport to the hospital and those with less serious injuries

- This step is required before transportation becomes available
- The categorization of patients based on the severity of their injuries can be aided with the use of printed triage tags or colored flagging

Rapid triage: S.T.A.R.T. (Simple Triage and Rapid Treatment) is a simple triage system that can be performed by lightly-trained lay and emergency personnel in emergencies

- It is not intended to supersede or instruct medical personnel or techniques
- It may serve as an instructive example
- It has been field-proven in mass casualty incidents such as train wrecks and bus accidents

Reverse Triage: In addition to the standard practices of triage as mentioned above, there are conditions where sometimes the less wounded are treated in preference to the more severely wounded. This may arise in

- A situation such as war where the military setting may require soldiers be returned to combat as quickly as possible
- Disaster situations where medical resources are limited in order to conserve resources for those likely to survive but requiring advanced medical care.

93. Safe disposal of mercury is:

a. Collect carefully and recycle
b. Controlled combustion
c. Treatment with chemicals
d. Deep burial

Ans: a

Mercury doesn't disappear, it finds its way into the environment. That's why mercury-containing products cannot be disposed of with regular trash or poured down the drain.

Mercury disposal:

- Dispose mercury as a hazardous waste
- 'Never combine it with organic or inorganic waste
- Never dispose it in sink/drain
- Dispose off in 'Recycling units'

94. Best way to dispose waste in Nepal can be:

a. Burn
b. Land fill
c. Dumping
d. Recycling

Ans: b

Ref: Municipal solid waste management in Nepal: practices and challenges; Pokhrel D, Viraraghavan T; Waste Manag. 2005;25(5):555-62.

The data showed that > or =70% of the solid wastes generated in Nepal are of organic origin. As such, composting of the solid waste and using it on the land is the best way of solid waste disposal. This will reduce the waste volume transported to the landfill and will increase its life.

95. Nepal is polio free since:

a. 2002
b. 2005
c. 2008
d. 2010

Ans: d

Ref: Official WHO website

Nepal - polio-free since 2010

- Preparations also begin for a vaccination campaign of the surrounding community and districts to ensure that, if it turns out that Kiran has polio, the disease is stopped in its tracks.
- Last year almost 600 cases of acute flaccid paralysis were reported in Nepal but fortunately not one of these children, including Kiran, were found to have polio. The country has remained free of polio infection since September 2010.

96. Medical Education Commission in Nepal was established in:

a. 2073
b. 2074
c. 2075
d. 2076

Ans: b

At various times, for the improvement on the medical sector; in order to address the demand, temporal need, based on the suggestion from reports and national requirement instructions on the ordinance was mentioned for the provision of medical education and **Medical Education Commission was established on Kartik 24, 2074.**

With the active initiatives of the concerned stakeholders and the Government of Nepal, the federal government brought the replacement bill to make the medical education commission functionable. **Medical Education Act 2075** was then passed by both the members of the federal parliament on Falgun 10, 2075.

According to this Act, the main objective of the commission is to co-ordinate and cooperate with the international level bodies and ensure the integrity and inclusive medical education, coordinating and cooperating with the national level affiliated agencies by assuring the autonomy and independence of other affiliate bodies.

97. Fourth amendment of Nepal Medical Council Act was done in:

a. 2044
b. 2047
c. 2056
d. 2058

Ans: d

NEPAL MEDICAL COUNCIL ACT 2020 (1964)

Nepal Medical Council was established in 2020 (1964), by the act No: 35 and in exercise of the powers, conferred by Nepal Medical Council act, Government of Nepal had framed its rules in the same year.

In 2024(1968), Government of Nepal declared the regulations of Nepal Medical Council by publishing in "Nepal Gazette".

Till date there were four amendments of Nepal Medical Council act, as per changing trend of medical education and medical services throughout the world including Nepal and the last amendment was held in 2058(2001).

Amending Acts:		**Date**
1.	Nepal Medical Council (First Amendment) Act, 2044 (1987)	2044/6/9 (Sept. 25, 1987)
2.	Nepal Medical Council (Second Amendment) Act, 2047 (1990)	2047/6/27 (Oct. 13, 1990)
3.	Nepal Medical Council (Third Amendment) Act, 2055 (1999)	2056/1/2 (April 15, 1999)
4.	Health Related Some Nepal Acts Amendment Act, 2058 (2001)	2058/5/6 (Aug. 22, 2001)

98. National immunization programme is which type of programme of Nepal government?

a. Priority 1

b. Priority 2
c. Priority 3
d. Priority 4

Ans: a
NATIONAL IMMUNIZATION PROGRAMME (NIP)

- Priority 1 (P1) programme of the Government of Nepal.
- Launched as the Expanded Programme on Immunization in 2034 BS (1977/78), the National Immunization Programme has met several milestones, including Millennium Development Goal 4 (MDG 4) on reducing under-5 mortality.
- Eleven antigens are provided through the national programme to eligible infants, children and mothers through more than 16,000 outreach sessions, including in geographically and economically hard-to-reach and marginalized communities.
- Eighteen districts and more than 1,800 village development committees (VDCs) have been declared fully immunized.
- A successful Human Papilloma Virus (HPV) vaccine demonstration project was implemented in Kaski and Chitwan.

99. Mites are the vectors of the following diseases except:

a. Scabies
b. Scrub typhus
c. Rickettsial pox
d. Kyasanur forest disease

Ans: d
Ref: Park 23rd Edition, Page No: 287
Kyasanur forest disease (KFD) is a febrile disease associated with haemorrhages caused by an arbovirus flavivirus and transmitted to man by bite of infective ticks.

Vector	**Disease (s) transmitted**
Housefly (Musca domestica)	Diarrhoeal & dysentrical diseases, Poliomyelitis, Yaws, Anthrax, Trachoma
Sandfly (Phlebotomus argentipes)	Kala azar (Visceral Leishmaniasis), Oriental sore (Cutaneous Leishmaniasis), Sandfly fever, Oroya fever
Tse-Tse fly (Glossina palpalis)	Sleeping sickness of Africa (African Trypanosomiasis)
Reduviid bug (Triatominae)	Chagas Disease (Sleeping sickness of America- American Trypanosomiasis)
Black fly (Simulium)	Onchocerciasis (River Blindness)
Soft tick	Relapsing fever, Q fever, KFD
Hard tick	Tularemia, Babesiosis, KFD, Tick paralysis, Tick encephalitis, Tick hemorrhagic fever, Indian Tick Typhus, RMSF
Louse	Epidemic typhus, Trench fever, Relapsing fever, Pediculoses
Mite	Scrub typhus, Rickettsia! pox
Flea	Plague, Murine typhus
Anopheles mosquito	Malaria, Filaria
Culex mosquito	Bancroftian Filariasis, Japanese Encephalitis, West Nile fever, Viral arthritis
Aedes mosquito	Yellow fever, Dengue, DHF, Chikungunya, Rift Valley fever, Filariasis

Mansonoides mosquito	Malayan (Brugian) filariasis, Chikungunya

100. Compared with cow's milk, mother's milk has more

a. Vit D
b. Fat
c. Lactose
d. Proteins

Ans: c
Ref: Park 23rd Edition, Page No: 630

		Buffalo	Cow	Goat	Human
Fat	(g)	6.5	4.1	4.5	3.4
Protein	(g)	4.3	3.2	3.3	1.1
Lactose	(g)	5.1	4.4	4.6	7.4
Calcium	(mg)	210	120	170	28
Iron	(mg)	0.2	0.2	0.3	
Vitamin C	(mg)	1	2	1	3
Minerals	(g)	0.8	0.8	0.8	0.1
Water	(g)	81.0	87	86.8	88
Energy	(kcal)	117	67	72	65

Table: Nutritive value of milks compared (value per 100 grams)

101. Thin-skull rule is:

a. An individual liable for all consequences resulting from their activities leading to an injury to another person
b. Penalty made when a doctor is on duty and harm is caused
c. Responsibility of senior doctor, when harm is caused by junior doctor
d. Autopsy done at done at night considered invalid

Ans: a
Ref: Gautam Biswas Forensic Medicine, 3rdEdition, Page No: 19
The eggshell skull rule (thin-skull rule) is a legal doctrine used in both civil and criminal law that holds an individual liable for all consequences resulting from their activities leading to an injury to another person, even if the victim suffers unusual damages due to a pre-existing vulnerability or medical condition.

102. Total number of justices in Supreme court of Nepal is:

a. 11
b. 21
c. 31
d. 41

Ans: b

Supreme Court of Nepal (Nepali: सर्वोच्च अदालत) is the highest court in Nepal. It has appellate jurisdiction over decisions of the seven High Courts (including eleven Benches of the High Courts) and extraordinary original jurisdiction. The court consists of twenty Justices and one Chief Justice.

103. Morphological female features are all, except:

a. Well defined waist
b. Larger abdominal segment
c. More prominent Adam's apple
d. Less facial hair

Ans: c
Ref: Gautam Biswas Forensic Medicine, 3rdEdition, Page No: 59

Differentiation 4.2: Determination of sex from physical/morphological feature

S.No.	Feature	Male	Female
1.	General built	Muscular, strong, stout	Less muscular, delicate, slender
2.	Scalp hair	Short, thick, coarse	Long, fine, thin
3.	Facial hair	Present	Absent
4.	Pubic hair	Thick, coarse, extends upwards with apex at umbilicus (rhomboidal)	Thin, fine, horizontal, covers mons veneris (triangular)
5.	Adam's apple	Prominent	Less prominent
6.	Shoulders	Broader than hip	Narrower than hip
7.	Waist	Not well-defined	Well-defined
8.	Trunk	Abdominal segment smaller	Abdominal segment larger
9.	Thorax	Dimensions more	Dimensions less
10.	Thighs	Cylindrical	Conical due to short femur and greater fat
11.	Breasts	Not developed	Developed after puberty
12.	Uterus and vagina	Absent	Present
13.	Penis	Present	Absent
14.	Gonads	Testes	Ovaries

104. Most common pattern of fingerprint is:

a. Arches
b. Loops
c. Whorls
d. Composite

Ans: b
Ref: Gautam Biswas Forensic Medicine, 3rdEdition, Page No: 85

Table 5.1: Types of fingerprint ridges

S. No.	Type	Percentage (%)
1.	Loop[6] (Ulnar/radial)	60–70
2.	Whorl	30–35
3.	Arch	5–10
4.	Composite	2–3

Plain or dab impression is obtained by gently pressing the inked surface of the tip of finger on paper.

Rolled impression is taken by rolling the inked finger from side to side.

105. Following poisoning retards putrefaction:

a. Aluminium phosphide
b. Lead
c. Arsenic
d. Copper

Ans: c
Ref: Gautam Biswas Forensic Medicine, 3rdEdition, Page No: 156
Preservation of dead bodies may occur naturally, if disposed off in favorable environmental condition. Dead bodies may also be preserved artificially.
The methods are:

- Freezing the body below 0°C, and at –17/–18°C the body may be preserved for years.
- The body is treated with chemical agents, like lead sulfide, arsenic and potassium carbonate which prevent bacterial action and autolysis.
- Embalming.

106. Ideally, oral iron preparations should be taken:

a. Empty stomach
b. Just before a meal
c. Along with meals
d. Following meals

An: a
Ref: Harrison 19th Edition, Page No: 629
Ideally, oral iron preparations should be taken on an empty stomach, since food may inhibit iron absorption. Some patients with gastric disease or prior gastric surgery require special treatment with iron solutions, because the retention capacity of the stomach may be reduced.

107. Conditions that increase demand of folic acid are all except:

a. Chronic hemolytic anemias
b. Pregnancy
c. Hemodialysis
d. Tropical sprue

Ans: d
Ref: Harrison 19th Edition, Page No: 646
Malabsorption of dietary folate occurs in tropical sprue and in gluten induced enteropathy.
In the rare congenital recessive syndrome of selective malabsorption of folate due to mutation of the proton coupled folate transporter (PCFT), there is an associated defect of folate transport into the cerebrospinal fluid, and these patients show megaloblastic anemia, which responds to physiologic doses of folic acid given parenterally but not orally.

108. Which of the following best relates to Heparin-induced thrombocytopenia (HIT) ?

a. Antibodies of the IgM isotype

b. Antibodies against neoantigens on PF4
c. More common in medical than surgical patients
d. More frequent in males than in females

Ans: b
Ref: Harrison 19th Edition, Page No: 751
HIT is an antibody-mediated process triggered by antibodies directed against neoantigens on PF4 that are exposed when heparin binds to this protein. These antibodies are of the IgG isotype and bind simultaneously to heparin-PF4 complex and to platelet Fc receptors. HIT is more common in surgical patients than in medical patients and, like many autoimmune disorders, occurs more frequently in females than in males.

TABLE 143-3 FEATURES OF HEPARIN-INDUCED THROMBOCYTOPENIA

Features	Details
Thrombocytopenia	Platelet count of ≤100,000/μL or a decrease in platelet count of ≥50%
Timing	Platelet count falls 5–10 days after starting heparin.
Type of heparin	More common with unfractionated heparin than low-molecular-weight heparin
Type of patient	More common in surgical patients and patients with cancer than general medical patients; more common in women than in men
Thrombosis	Venous thrombosis more common than arterial thrombosis

109. Which of the following is the most common primary tumor of heart in children ?
a. Myxoma
b. Rhabdomyoma
c. Lipoma
d. Hemangioma

Ans: b
Ref: Harrison 19th Edition, Page No: 289e-2
- Rhabdomyomas and fibromas are the most common cardiac tumors in infants and children and usually occur in the ventricles, where they may produce mechanical obstruction to blood flow, thereby mimicking valvular stenosis, congestive heart failure (CHF), restrictive or hypertrophic cardiomyopathy, or pericardial constriction.
- Rhabdomyomas are probably hamartomatous growths, are multiple in 90% of cases, and are strongly associated with tuberous sclerosis.
- These tumors have a tendency to regress completely or partially; only tumors that cause obstruction require surgical resection.
- Fibromas are usually single, are often calcified, tend to grow and cause obstructive symptoms, and should be resected.

110. Bicuspid aortic valve disease may be associated with:
a. Ellis-van Creveld syndrome
b. Noonan syndrome

c. Holt-Oram syndrome
d. Turner's syndrome

Ans: d

Ref: Harrison 19th Edition, Page No: 1529

- A bicuspid aortic valve (BAV) is the most common congenital heart valve defect and occurs in 0.5–1.4% of the population with a 2–4:1 male-to-female predominance.
- The inheritance pattern appears to be autosomal dominant with incomplete penetrance, although some have questioned an X-linked component as suggested by the prevalence of BAV disease among patients with Turner's syndrome.

111. Normally, the content of O2 in mixed venous blood (Co2) is ?

a. 12.76 mL O2 per dL blood
b. 13.76 mL O2 per dL blood
c. 14.76 mL O2 per dL blood
d. 15.76 mL O2 per dL blood

Ans: d

Ref: Harrison 19th Edition, Page No: 1733

Oxygen delivery (Qo2) is a function of cardiac output and content of O2 in arterial blood (Cao2). Normally, content of O2 in mixed venous blood (Co2) is 15.76 mL O2 per dL blood, since the mixed venous blood is 75% saturated.

Oxygen delivery (QO2) is a function of cardiac output and the content of O2 in the arterial blood (CaO2). The CaO2 is determined by the hemoglobin concentration, the arterial hemoglobin saturation, and dissolved O2 not bound to hemoglobin.

For normal adults:

QO2

= 50 dL/min × (1.39 × 15 g/dL [hemoglobin concentration] × 1.0 [hemoglobin % saturation] + 0.0031 × 100 [PaO2])

= 50 dL/min (cardiac output) × 21.6 mL O2 per dL blood (CaO2)

= 1058 mL O2 per minimal

It is apparent that nearly all of the O2 delivered to tissues is bound to hemoglobin and that the dissolved O2 (PaO2) contributes very little to O2 content in arterial blood or to O2 delivery. Normally, the content of O2 in mixed venous blood (C–vO2) is 15.76 mL/dL since the mixed venous blood is 75% saturated. Therefore, the normal tissue extraction ratio for O2 is CaO2 – C–vO2/CaO2 ([21.16–15.76]/21.16) or ~25%. A pulmonary artery catheter allows measurements of O2 delivery and the O2 extraction ratio.

112. "Cobblestone mucosa" in CD is mainly seen in:

a. Sigmoid colon
b. Transverse colon
c. Ileum
d. Rectum

Ans: c

Ref: Harrison 19th Edition, Page No: 1952, 1956

Unlike UC, CD is a transmural process. CD is segmental with skip areas in the midst of diseased intestine. In CD, stellate ulcerations fuse longitudinally & transversely to demarcate islands of mucosa that are histologically normal. This

"cobblestone" appearance is characteristic of CD, endoscopically and by barium radiography. Oral mucosal lesions in CD include aphthous stomatitis & "cobblestone" lesions of the buccal mucosa.
"Cobblestoning" from longitudinal and transverse ulcerations most frequently involves the small bowel.

TABLE 351-5 DIFFERENT CLINICAL, ENDOSCOPIC, AND RADIOGRAPHIC FEATURES

	Ulcerative Colitis	Crohn's Disease
Clinical		
Gross blood in stool	Yes	Occasionally
Mucus	Yes	Occasionally
Systemic symptoms	Occasionally	Frequently
Pain	Occasionally	Frequently
Abdominal mass	Rarely	Yes
Significant perineal disease	No	Frequently
Fistulas	No	Yes
Small intestinal obstruction	No	Frequently
Colonic obstruction	Rarely	Frequently
Response to antibiotics	No	Yes
Recurrence after surgery	No	Yes
Endoscopic		
Rectal sparing	Rarely	Frequently
Continuous disease	Yes	Occasionally
"Cobblestoning"	No	Yes
Granuloma on biopsy	No	Occasionally
Radiographic		
Small bowel significantly abnormal	No	Yes
Abnormal terminal ileum	No	Yes
Segmental colitis	No	Yes
Asymmetric colitis	No	Yes
Stricture	Occasionally	Frequently

113. The major androgen secreted by adrenal gland is:

a. Dehydroepiandrosterone (DHEA)
b. Androstenedione
c. 11 beta-hydroxyandrostenedione
d. Testosterone

Ans: a
Ref: Harrison 19th Edition, Page No: 2309

- The adrenal cortex produces three classes of corticosteroid hormones: glucocorticoids (e.g., cortisol), mineralocorticoids (e.g., aldosterone), and adrenal androgen precursors (e.g., dehydroepiandrosterone [DHEA]).
- Glucocorticoids and mineralocorticoids act through specific nuclear receptors, regulating aspects of the physiologic stress response as well as blood pressure and electrolyte homeostasis.
- Adrenal androgen precursors are converted in the gonads and peripheral target cells to sex steroids that act via nuclear androgen and estrogen receptors.

114. "Ischemic penumbra" is located at:

a. Center of the core region of infarction
b. Within the core region of infarction
c. Surrounding the core region of infarction
d. Any of the above

Ans: c

Ref: Harrison 19th Edition, Page No: 440e-8, 2560
Perfusion and diffusion imaging are EPI techniques that are useful in early detection of ischemic injury of the brain and may be useful together to demonstrate infarcted tissue as well as ischemic but potentially viable tissue at risk of infarction (e.g., the ischemic penumbra).
Ischemic penumbra: Defined as the ischemic but reversibly dysfunctional tissue surrounding a core area of infarction. The penumbra can be imaged by perfusion-diffusion imaging using MRI or CT.
The ischemic penumbra will eventually progress to infarction if no change in flow occurs, and hence saving the ischemic penumbra is the goal of revascularization therapies.

115. Which of the following drugs is used for patients with progressive disability in MS ?

a. Glucocorticoid
b. Plasma exchange
c. Mitoxantrone
d. Glatiramer acetate

Ans: c
Ref: Harrison 19th Edition, Page No: 2667
Mitoxantrone is an immune suppressant generally reserved for patients with progressive disability who have failed other treatments. Mitoxantrone should not be used as a first-line agent in either RRMS or relapsing SPMS.
DISEASE-MODIFYING THERAPIES FOR RELAPSING FORMS OF MS (RRMS, SPMS WITH EXACERBATIONS)
Ten such agents are approved by the U.S. Food and Drug Administration (FDA): (1) IFN-β-1a (Avonex), (2) IFN-β-1a (Rebif), (3) IFN-β-1b (Betaseron or Extavia), (4) glatiramer acetate (Copaxone), (5) natalizumab (Tysabri), (6) fingolimod (Gilenya), (7) dimethyl fumarate (Tecfidera), (8) teriflunomide (Aubagio), (9) mitoxantrone (Novantrone), and (10) alemtuzumab (Lemtrada).

116. Which of the following is a feature of cardiac remodeling?

a. Impaired ventricular systolic pump function
b. Cardiac enlargement
c. Cardiac hypertrophy
d. All of the above

Ans: d
Ref: Harrison 16th Edition, Page No: 1408
Left and/or right ventricular systolic pump function is impaired, leading to progressive cardiac enlargement and hypertrophy, a process called remodeling.

117. Karyotype in Mayer-Rokitansky-Kuster-Hauser syndrome is:

a. 45,XX
b. 46,XX
c. 47,XX
d. 48,XX

Ans: b
Ref: Harrison 19th Edition, Page No: 335

Abnormalities of the uterus and outflow tract typically present as primary amenorrhea. In patients with normal pubertal development and a blind vagina, the differential diagnosis includes obstruction by a transverse vaginal septum or imperforate hymen; müllerian agenesis (Mayer-Rokitansky-Kuster-Hauser syndrome), which has been associated with mutations in the WNT4 gene; and androgen insensitivity syndrome (AIS), which is an X-linked recessive disorder that accounts for ~10% of all cases of primary amenorrhea. Patients with AIS have a 46,XY karyotype, but because of the lack of androgen receptor responsiveness, those with complete AIS have severe underandrogenization and female external genitalia.

Mayer-Rokitansky-Kuster-Hauser Syndrome

- Congenital absence of a uterus and upper vagina
  - also described as Müllerian aplasia or Müllerian agenesis
  - the most common cause of vaginal agenesis
- The most common single diagnosis cause of primary amenorrhea (15% of cases)
- Chromosomally: 46, XX with intact ovaries
- Hormonally normal

Presentation

- Symptoms
  - primary amenorrhea
  - normal development of secondary sexual characteristics, including thelarche and adrenarche
- Physical exam
  - complete or partial absence of the cervix, uterus, vagina
- Imaging
  - ultrasound supports diagnosis

Differential Diagnosis

- Complete Androgen Insensitivity Syndrome (AIS)
- In AIS, differences include:
  - genotype XY
  - decreased pubic and axillary hair
  - increased height
  - presence of intra-abdominal testicles

118. Pain-sensitive structures in spine include all except:

a. Periosteum of vertebrae
b. Nucleus pulposus of intervertebral disk
c. Annulus fibrosus of intervertebral disk
d. Dura

Ans: b
Ref: Harrison 19th Edition, Page No: 111

- Pain-sensitive structures of the spine include the periosteum of the vertebrae, dura, facet joints, annulus fibrosus of the intervertebral disk, epidural veins and arteries, and the longitudinal ligaments.
- Disease of these diverse structures may explain many cases of back pain without nerve root compression.
- Under normal circumstances, the nucleus pulposus of the intervertebral disk is not pain sensitive.

119. Which of the following has no effect on HDL cholesterol?

a. Fibrates
b. Bile acid sequestrants
c. Ezetimibe
d. Nicotinic acid

Ans: c
Ref: Harrison 19th Edition, Page No: 2454
Ref: USMLE Step 1 First Aid 2020, Page No: 320
To increase HDL cholesterol, statins, fibrates, and bile acid sequestrants have modest effects (5 - 10%). There is no effect on HDL cholesterol with ezetimibe or omega-3 fatty acids. Nicotinic acid is the only currently available drug with predictable HDL cholesterol-raising properties.

Lipid-lowering agents

DRUG	LDL	HDL	TRIGLYCERIDES	MECHANISMS OF ACTION	ADVERSE EFFECTS/PROBLEMS
HMG-CoA reductase inhibitors (eg, atorvastatin, simvastatin)	↓↓↓	↑	↓	Inhibit conversion of HMG-CoA to mevalonate, a cholesterol precursor; ↑ LDL recycling; ↓ mortality in CAD patients	Hepatotoxicity (↑ LFTs), myopathy (esp when used with fibrates or niacin)
Bile acid resins Cholestyramine, colestipol, colesevelam	↓↓	↑ slightly	↑ slightly	Prevent intestinal reabsorption of bile acids; liver must use cholesterol to make more	GI upset, ↓ absorption of other drugs and fat-soluble vitamins
Ezetimibe	↓↓	↑/—	↓/—	Prevents cholesterol absorption at small intestine brush border	Rare ↑ LFTs, diarrhea
Fibrates Gemfibrozil, bezafibrate, fenofibrate	↓	↑	↓↓↓	Upregulate LPL → ↑ TG clearance Activates PPAR-α to induce HDL synthesis	Myopathy (↑ risk with statins), cholesterol gallstones (via inhibition of cholesterol 7α-hydroxylase)
Niacin	↓↓	↑↑	↓	Inhibits lipolysis (hormone-sensitive lipase) in adipose tissue; reduces hepatic VLDL synthesis	Flushed face (↓ by NSAIDs or long-term use) Hyperglycemia Hyperuricemia
PCSK9 inhibitors Alirocumab, evolocumab	↓↓↓	↑	↓	Inactivation of LDL-receptor degradation → ↑ removal of LDL from bloodstream	Myalgias, delirium, dementia, other neurocognitive effects
Fish oil and marine omega-3 fatty acids	↑ slightly	↑ slightly	↓ at high doses	Believed to decrease FFA delivery to liver and decrease activity of TG-synthesizing enzymes	Nausea, fish-like taste

120. Early (30-day) mortality rate from acute MI is:

a. ~ 10 %
b. ~ 20 %
c. ~ 30 %
d. ~ 40 %

Ans: c
Ref: Harrison 18th Edition, Page No: 2021
Early (30-day) mortality rate from AMI is ~30%, with more than half of these deaths occurring before the patient reaches hospital.

121. MELD score is calculated based on all except:

a. Prothrombin time
b. Serum albumin
c. Serum creatinine
d. Serum bilirubin

Ans: b
Ref: Harrison 19th Edition, Page No: 1995

TABLE 357-4 CHILD-PUGH CLASSIFICATION OF CIRRHOSIS

		Points Toward Total Score		
Factor	**Units**	**1**	**2**	**3**
Serum bilirubin	μmol/L	<34	34–51	>51
	mg/dL	<2.0	2.0–3.0	>3.0
Serum albumin	g/L	>35	30–35	<30
	g/dL	>3.5	3.0–3.5	<3.0
Prothrombin time	seconds prolonged	<4	4–6	>6
	INR[a]	<1.7	1.7–2.3	>2.3
Ascites		None	Easily controlled	Poorly controlled
Hepatic encephalopathy		None	Minimal	Advanced

[a]International normalized ratio.

Note: The Child-Pugh score is calculated by adding the scores for the five factors and can range from 5 to 15. The resulting Child-Pugh class can be A (a score of 5–6), B (7–9), or C (≥10). Decompensation indicates cirrhosis, with a Child-Pugh score of ≥7 (class B). This level has been the accepted criterion for listing a patient for liver transplantation.

- Recently, the Child-Pugh system has been replaced by the Model for End-Stage Liver Disease (MELD) system for the latter purpose.
- The MELD score is a prospectively derived system designed to predict the prognosis of patients with liver disease and portal hypertension.
- **This score is calculated from three noninvasive variables: the prothrombin time expressed as the international normalized ratio (INR), the serum bilirubin level, and the serum creatinine concentration.**

(Please, remember both)

122. Length of menstrual cycle is defined as:

a. From end of one menstrual bleeding episode to onset of next
b. From end of one menstrual bleeding episode to end of next
c. From onset of one menstrual bleeding episode to onset of next
d. From onset of one menstrual bleeding episode to end of next

Ans: c
Ref: Harrison 16th Edition, Page No: 2200
Length of the menstrual cycle is defined as the time from the onset of one menstrual bleeding episode to onset of the next.

123. Not a part of POEMS syndrome?

a. Polyneuropathy
b. Optic neuritis
c. Endocrinopathies
d. M-protein

Ans: b
Ref: Harrison 19th Edition, Page No: 2348

POEMS SYNDROME

- POEMS (polyneuropathy, organomegaly, endocrinopathy, M-protein, and skin changes; also known as Crow-Fukase syndrome; OMIM 192240) patients usually present with a progressive sensorimotor olyneuropathy, diabetes mellitus (50%), primary gonadal failure (70%), and a plasma cell dyscrasia with sclerotic bony lesions.
- Associated findings can be hepatosplenomegaly, lymphadenopathy, and hyperpigmentation.
- Patients often present in the fifth to sixth decade of life and have a median survival after diagnosis of less than 3 years.
- The syndrome is assumed to be secondary to circulating immunoglobulins, but patients have excess vascular endothelial growth factor as well as elevated levels of other inflammatory cytokines such as IL1-β, IL-6, and tumor necrosis factor α.

124. Commotio cordis is:

a. Impact to chest wall overlying heart
b. Torsion injury of heart
c. Kinking of coronary artery
d. Aneurysmal rupture of coronary artery

Ans: a
Ref: Harrison 19th Edition, Page No: 289e-3

- Blunt, nonpenetrating, often innocent-appearing injuries to the chest may trigger ventricular fibrillation even in absence of overt signs of injury. This syndrome, referred to as commotio cordis, occurs most often in adolescents during sporting events (e.g., baseball, hockey, football, and lacrosse) and probably results from an impact to the chest wall overlying the heart during the susceptible phase of repolarization just before the peak of the T wave. Survival depends on prompt defibrillation.
- Sudden emotional or physical trauma, even in the absence of direct cardiac trauma, may precipitate a transient catecholamine-mediated cardiomyopathy referred to as tako-tsubo syndrome or the apical ballooning syndrome.

125. What proportion of alcoholics develop alcoholic liver disease?

a. 15 %
b. 30 %
c. 45 %
d. 75 %

Ans: a
Ref: Harrison 19th Edition, Page No: 2052

TABLE 363-1 RISK FACTORS FOR ALCOHOLIC LIVER DISEASE

Risk Factor	Comment
Quantity	In men, 40–80 g/d of ethanol produces fatty liver; 160 g/d for 10–20 years causes hepatitis or cirrhosis. Only 15% of alcoholics develop alcoholic liver disease.
Gender	Women exhibit increased susceptibility to alcoholic liver disease at amounts >20 g/d; two drinks per day is probably safe.
Hepatitis C	HCV infection concurrent with alcoholic liver disease is associated with younger age for severity, more advanced histology, and decreased survival.
Genetics	Patatin-like phospholipase domain-containing protein 3 (PNPLA3) has been associated with alcoholic cirrhosis.
Fatty liver	Alcohol injury does not require malnutrition, but obesity and nonalcoholic fatty liver are risk factors. Patients should receive vigorous attention to nutritional support.

126. An HIV patient complains of visual disturbances. Fundal examination shows bilateral retinal exudates and perivascular hemorrhages. Which of the following viruses are most likely to be responsible for this retinitis:

a. Herpes simplex
b. Varicella zoster
c. Cytomegalovirus
d. EBV

Ans: c
Ref: Harrison 20th Edition, Page No: 1447
Ophthalmologic problems occur in ~50% of patients with advanced HIV infection. The most common abnormal findings on funduscopic examination are cotton-wool spots. In contrast to CMV retinitis, however, these lesions are not associated with visual loss and tend to remain stable or improve over time. One of the most devastating consequences of HIV infection is CMV retinitis. Patients at high risk of CMV retinitis are those with CD4+ T cell count <100/ µL. CMV retinitis usually presents as a painless, progressive loss of vision. Patients may also complain of blurred vision, “floaters,” and scintillations. The disease is usually bilateral, although typically it affects one eye more than the other. The characteristic retinal appearance is that of perivascular hemorrhage and exudate.

127. A 31-year-old man is treated for a fourth episode of disseminated Neisseria gonorrhoeae infection in the last 5 years. He had no previous history of unusual or recurrent infections. If he has an immunologic defect, which of the following is most likely?

a. C8 deficiency
b. DiGeorge syndrome
c. Selective IgA deficiency
d. Severe combined immunodeficiency

Ans: a
Ref: Harrison 20th Edition, Page No: 2491

Deficiencies of any complement component involved in the lytic phase (C5, C6, C7, C8, and, to a lesser extent, C9) predispose affected individuals to systemic infection by Neisseria. This is explained by the critical role of complement in the lysis of the thick cell wall possessed by this class of bacteria.
DiGeorge syndrome is a condition in which there is failure of formation of the third and fourth pharyngeal pouches. Diagnosed in infancy, these individuals have facial abnormalities, failure of formation of the parathyroids, and cardiac defects, as well as an absence of T-lymphocyte development. This condition predisposes to early viral and fungal infections.
Selective IgA deficiency result in respiratory and gastrointestinal tract infections, autoimmune disease, and allergies.
Severe combined immunodeficiency (choice E) typically presents with early susceptibility to viral and fungal agents. It is most frequently diagnosed in infancy, after the disappearance of maternally derived IgG antibodies.

128. Hearing impairment, cataracts and patent ductus arteriosus in a newborn suggest in utero infection with what viral family?

a. Paramyxovirus
b. Picornavirus
c. Reovirus
d. Togavirus

Ans: d
Ref: Harrison 20th Edition, Page No: 1478, 1479
The description fits congenital rubella, a togavirus, which is an enveloped positive sense RNA virus.

Common Transient and Permanent Manifestations in Infants with Congenital Rubella Syndrome

TRANSIENT MANIFESTATIONS	PERMANENT MANIFESTATIONS
Hepatosplenomegaly	Hearing impairment/deafness
Interstitial pneumonitis	Congenital heart defects (patent ductus arteriosus, pulmonary arterial stenosis)
Thrombocytopenia with purpura/petechiae (e.g., dermal erythropoiesis or "blueberry muffin syndrome")	Eye defects (cataracts, cloudy cornea, microphthalmos, pigmentary retinopathy, congenital glaucoma)
Hemolytic anemia	Microcephaly
Bony radiolucencies	Central nervous system sequelae (mental and motor delay, autism)
Intrauterine growth retardation	
Adenopathy	
Meningoencephalitis	

129. A gardener presented with multiple papules on hand and multiple eruptions along the lymphatics. Most common fungus responsible is:

a. Sporothrix schenckii
b. Cladosporium
c. Histoplasma
d. Candida

Ans: a
Ref: Harrison 20th Edition, Page No: 1542

- Sporotrichosis most commonly affects persons who participate in outdoor activities such as landscaping, gardening, and tree farming.

- Sporotrichosis is primarily a localized infection of skin and subcutaneous tissues that follows traumatic inoculation of conidia.
- Days or weeks after inoculation, a papule develops at the site and then usually ulcerates but is not very painful. Similar lesions develop sequentially along the lymphatic channels proximal to the original lesion.

130. A 43-year-old gentleman with a history of intravenous drug use presents with general fatigue and weakness accompanied by swelling in his ankles and lower legs. Further questions elicit that he has had many infections due to his drug use but has not previously had any cardiac or pulmonary issues. Upon physical examination you notice a holosystolic blowing murmur radiating to the right sternal border, which the patient denies being told about previously. Based on this presentation, what is the most likely cause of the murmur?

a. Ventricular septal defect
b. Tricuspid stenosis
c. Tricuspid regurgitation
d. Mitral stenosis

Ans: c
This patient's presentation is consistent with a diagnosis of tricuspid regurgitation secondary to right sided endocarditis related to the use of intravenous drugs.

- Tricuspid regurgitation presents as a holosystolic blowing murmur with right sided radiation. It is often associated with symptoms of right heart dysfunction such as increased jugular venous pressure and accumulation of systemic edema in dependent areas such as the ankles. It is important to suspect tricuspid valve dysfunction in patients with a history of intravenous drug use because bacteria such as staphylococcus aureus are often present as contaminants in the drugs used. Upon introduction to the blood stream, these bacteria can damage heart valves and cause new onset murmurs.
- Ventricular septal defects produce a holosystolic harsh sounding murmur but would be unlikely to first present in a patient of this age.
- Tricuspid stenosis is uncommon and would present as a diastolic murmur.
- Mitral stenosis would present as a diastolic murmur that presents after an opening snap
- Mitral regurgitation would radiate to the left axilla rather than to the right sternal border.

131. Endolymph in inner ear:

a. Is a filtrate of blood serum
b. Is secreted by striae vascularis
c. Is secreted by basilar membrane
d. Is secreted by hair cells

Ans: b
Ref: Dhingra ENT 6th Edition, Page No: 10
Cochlear duct:
Also called membranous cochlea or the scala media.
It is a blind coiled tube.
It appears triangular on cross-section and its three walls are formed by:

- the basilar membrane, which supports the organ of Corti;
- the Reissner's membrane, which separates it from the scala vestibule; and
- the stria vascularis, which contains vascular epithelium and is concerned with secretion of endolymph.

There are two main fluids in the inner ear: perilymph and endolymph.

Perilymph

- Resembles extracellular fluid and is rich in Na ions.
- It fills the space between the bony and the membranous labyrinth.
- It communicates with CSF through the aqueduct of cochlea which opens into the scala tympani near the round window. In fact this duct is not a direct communication but contains connective tissue resembling arachnoid through which perilymph percolates.

Endolymph

- Fills the entire membranous labyrinth and resembles intracellular fluid, being rich in K ions.
- It is secreted by the secretory cells of the stria vascularis of the cochlea and by the dark cells (present in the utricle and also near the ampullated ends of semicircular ducts).

132. All are causes of sensorineural deafness except:

a. Old age
b. Cochlear otosclerosis
c. Loud sound
d. Rupture of tympanic membrane

Ans: d
Ref: Dhingra ENT 6th Edition, Page No: 32
Sensorineural hearing loss (SNHL)
Results from lesions of the cochlea, VIIIth nerve or central auditory pathways. It may be present at birth (congenital) or start later in life (acquired).
The characteristics of sensorineural hearing loss are:

- A positive Rinne test, i.e. AC > BC.
- Weber lateralized to better ear.
- Bone conduction reduced on Schwabach and absolute bone conduction tests.
- More often involving high frequencies.
- No gap between air and bone conduction curve on audiometry.
- Loss may exceed 60 dB.
- Speech discrimination is poor.
- There is difficulty in hearing in the presence of noise.

AETIOLOGY

CONGENITAL

It is present at birth and is the result of anomalies of the inner ear or damage to the hearing apparatus by prenatal or perinatal factors.

ACQUIRED

It appears later in life. The cause may be genetic or nongenetic.
The genetic hearing loss may manifest late (delayed onset) and may affect only the hearing, or be a part of a larger syndrome affecting other systems of the body as well (syndromal). Common causes of acquired SNHL include:

- Infections of labyrinth—viral, bacterial or spirochetal
- Trauma to labyrinth or VIIIth nerve, e.g. fractures of temporal bone or concussion of the labyrinth or the ear surgery

- Noise-induced hearing loss
- Ototoxic drugs
- Presbycusis
- Ménière's disease
- Acoustic neuroma
- Sudden hearing loss
- Familial progressive SNHL
- Systemic disorders, e.g. diabetes, hypothyroidism, kidney disease, autoimmune disorders, multiple sclerosis, blood dyscrasias.

133. Electrocochleography is

a. Probe, stimulation of outer hair cells only
b. Summation of microphonics
c. AP of cochlear nerve
d. Evoked potential generated in cochlea and auditory nerve

Ans: d
Ref: Dhingra ENT 6th Edition, Page No: 119
Electrocochleography:

- It can measure auditory sensitivity to within 20 dB.
- But it is an invasive procedure requiring placement of electrodes through the tympanic membrane.

Auditory brainstem response:
It is not a direct test of hearing but correlates highly with the pure-tone thresholds.

- Identifiable waveforms in ABR are generally present 10–20 dB above behavioural threshold.
- ABR provides an ear-specific information as sound stimulus can be presented to each ear separately by headphones or ear inserts.
- It is an objective test and can be done under sedation as the latter has no effect on ABR.
- ABR is used both as a screening test and as a definitive hearing assessment test in children. In a screening test, a response to a click stimulus of less than 40 dB nHL or less is the criterion of passing the test.
- To find hearing threshold in an infant, ABR tracing is obtained first at higher sound stimulus and then gradually lowered till wave V is just identifiable but repeatable.

134. Arterial supply of tonsil is mainly by:

a. Maxillary artery
b. Tonsillar branch of facial artery
c. Middle meningeal artery
d. Internal carotid artery

Ans: b
Ref: Dhingra ENT 6th Edition, Page No: 257
The tonsil is supplied by five arteries:

- Tonsillar branch of facial artery. This is the main artery.
- Ascending pharyngeal artery from external carotid.
- Ascending palatine, a branch of facial artery.

- Dorsal linguae branches of lingual artery.
- Descending palatine branch of maxillary artery.

VENOUS DRAINAGE

- Veins from the tonsils drain into paratonsillar vein which joins the common facial vein and pharyngeal venous plexus.

LYMPHATIC DRAINAGE

- Lymphatics from the tonsil pierce the superior constrictor and drain into upper deep cervical nodes particularly the jugulodigastric (tonsillar) node situated below the angle of mandible.

NERVE SUPPLY

- Lesser palatine branches of sphenopalatine ganglion (CN V) and glossopharyngeal nerve provide sensory nerve supply.

135. Most common presentation in nasopharyngeal carcinoma:

a. Epistaxis
b. Hoarseness of voice
c. Nasal stuffiness
d. Cervical lymphadenopathy

Ans: d
Ref: Dhingra ENT 6th Edition, Page No: 251

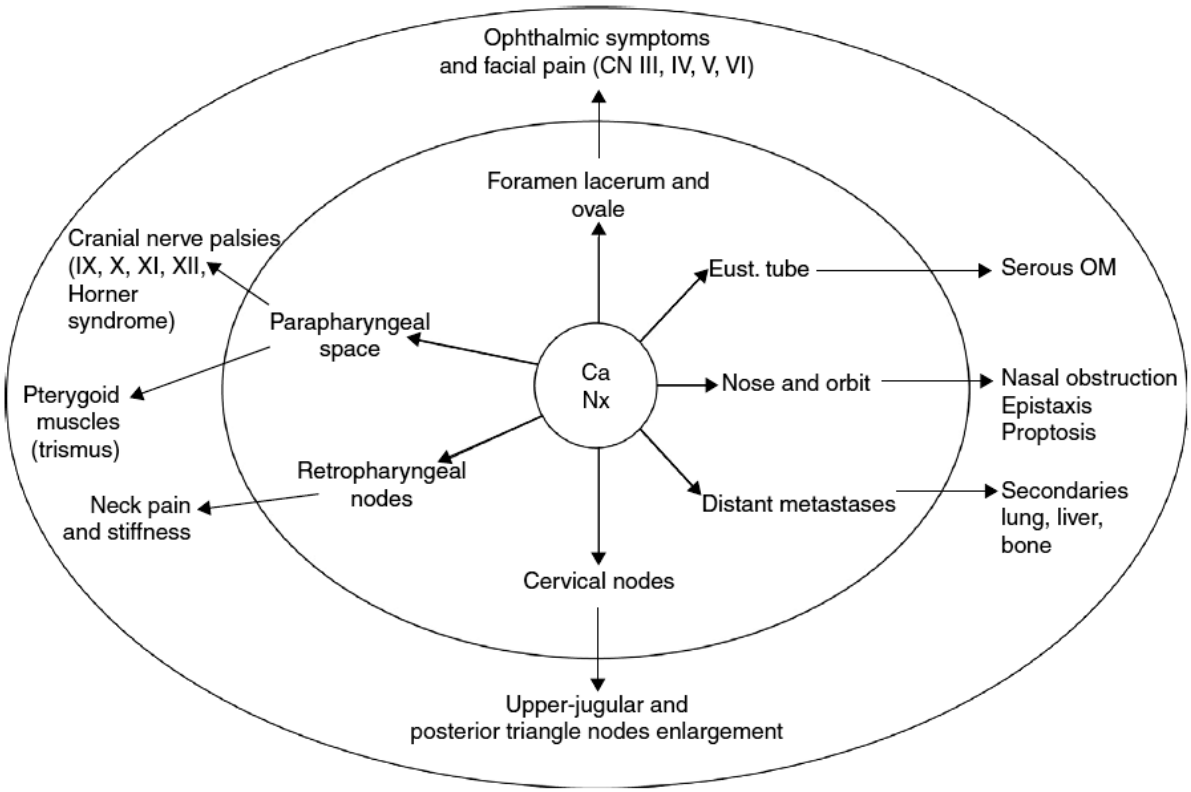


Fig: Routes of spread (inner area) and clinical features (outer area) of nasopharyngeal cancer.

Cervical lymphadenopathy is the most common presentation of nasopharyngeal carcinoma. It may be the only manifestation in some cases.

136. Arlt's line is seen in:

a. Vernal keratoconjunctivitis
b. Pterygium
c. Trachoma
d. Ocular pemphigoid

Ans: c
Ref: AK Khurana Ophthalmology 6th Edition, Page No: 500, 69
Scarring on the conjunctiva may be in the form of a single line in the area of sulcus subtarsalis (Arlt's line), irregular, or star-shaped. Common causes of scarring are:

- Trachoma
- Healed membranous or pseudomembranous conjunctivitis
- Healed traumatic wounds
- Surgical scars

Conjunctival signs in Trachoma

- Conjunctival scarring, which may be irregular, star-shaped or linear. Linear scar present in the sulcus subtarsalis is called Arlt's line.
- Concretions are hard looking whitish deposits varying from pin point to 2 mm in size. These are not calcareous deposits, but are formed due to accumulation of dead epithelial cells and inspissated mucus in the depressions called glands of Henle. Hence, the name is misnomer.

137. First sign in sympathetic ophthalmitis:

a. Aqueous flare
b. Keratic precipitates
c. Retrolental flare
d. Constriction of the pupil

Ans: c
Ref: AK Khurana Ophthalmology 6th Edition, Page No: 437, 438
Sympathetic ophthalmitis is a serious bilateral granulomatous panuveitis which follows a penetrating ocular trauma. The injured eye is called exciting eye and the fellow eye which also develops uveitis is called sympathizing eye. Very rarely, sympathetic ophthalmitis can also occur following an intraocular surgery.
Clinical features
I. Exciting (injured) eye:

- It shows clinical features of persistent low grade plastic uveitis, which include ciliary congestion, lacrimation and tenderness.
- Keratic precipitates may be present at the back of cornea (dangerous sign).

II. Sympathizing (sound) eye:

- It is usually involved after 4–8 weeks of injury in the other eye. Earliest reported case is after 9 days of injury.
- Most of the cases occur within the first year. However, delayed and very late cases are also reported. Sympathetic ophthalmitis, almost always, manifests as acute plastic iridocyclitis. Rarely it may manifest as neuroretinitis or choroiditis.

Clinical feature of the iridocyclitis in sympathizing eye can be divided into two stages:
Prodromal stage.

Symptoms:

- Sensitivity to light (photophobia) and transient indistinctness of near objects (due to weakening of accommodation) are the earliest symptoms.

Signs:

- **In this stage, the first sign may be presence of retrolental flare and cells or the presence of a few keratic precipitates (KPs) on back of cornea.**
- Other signs includes mild ciliary congestion, slight tenderness of the globe, fine vitreous haze and disc oedema which is seen occasionally.

Fully-developed stage:

- It is clinically characterized by typical signs and symptoms consistent with acute plastic iridocyclitis.

138. Laser used in the treatment of myopia:

a. Nd- YAG
b. Excimer
c. Argon
d. Krypton

Ans: b
Ref: AK Khurana Ophthalmology 6th Edition, Page No: 462, 582
Therapeutic applications of excimer lasers are: **photorefractive keratectomy (PRK), laser assisted in situ keratomileusis (LASIK) for correction of refractive errors and phototherapeutic keratectomy (PTK) for corneal diseases such as bandshaped keratopathy.**

Surgical treatment of myopia.

- Radial keratotomy.
- Photorefractive keratectomy (PRK) using excimer laser
- Automated microlamellar keratectomy (ALK).
- Removal of clear crystalline lens by extracapsular cataract extraction (ECCE) is recommended in unilateral very high myopia.

139. Aniseikonia means:

a. Unequal image projection in two retina
b. Unequal power of two lens
c. Unequal curvature of two cornea
d. Unequal power (D) of two eyeballs

Ans: a
Ref: AK Khurana Ophthalmology 6th Edition, Page No: 583
Aniseikonia is defined as a condition, wherein the images projected to the visual cortex from the two retina are abnormally unequal in size and shape.

140. Not a feature of concave lens:

a. It is thicker at the centre.
b. An object held close to it appears magnified.
c. When it is moved, the objects seen through it move in the same direction of the lens.

d. All points favor concave lens

Ans: c
Ref: AK Khurana Ophthalmology 6th Edition, Page No: 585
How to identify a concave lens:
A concave lens can be identified from following features:

- It is thin at the centre and thick at the periphery.
- An object seen through it appears minified.
- When it is moved, the objects seen through it move in the same direction of the lens.

How to identify convex lens:
A convex lens can be identified from following features:

- It is thicker at the centre.
- An object held close to it appears magnified.
- When it is moved, the objects seen through it move in the opposite direction.

141. A patient presents to the emergency department of National Trauma Centre with arm pain. The patient recently experienced an open fracture of his radius when he fell from a ladder while cleaning his house. Surgical reduction took place and the patient's forearm was put in a cast. Since then, the patient has experienced worsening pain in his arm. The patient has a past medical history of hypertension and asthma. His current medications include albuterol, fluticasone, loratadine, and lisinopril. His temperature is 99.5°F (37.5°C), blood pressure is 150/95 mmHg, pulse is 90/min, respirations are 19/min, and oxygen saturation is 99% on room air. The patient's cast is removed. On physical exam, the patient's left arm is tender to palpation. Passive motion of the patient's wrist and fingers elicits severe pain. The patient's left radial and ulnar pulses are both palpable and regular. The forearm is soft and does not demonstrate any bruising but is tender to palpation. Which of the following is the next best step in management?

a. Ibuprofen and reassurance
b. Replace the cast with a sling
c. Radiography
d. Emergency fasciotomy

Ans: d
This patient is presenting with symptoms of compartment syndrome in the setting of a recent fracture. The best initial step in management is an emergency fasciotomy.
Compartment syndrome typically occurs in an injured limb after a crush injury. Symptoms include pain out of proportion to the injury, pain with passive stretch, compartment tenseness, paresthesias, and sometimes decreased distal pulses. It is important to note that a diagnosis cannot be ruled out by palpating distal pulses or by measuring compartment pressure. The best initial step in management is an emergency fasciotomy.

- Ibuprofen and reassurance would be appropriate management of normal musculoskeletal pain. This patient's symptoms are severe and warrant intervention to avoid permanent injury.
- Replacing the cast with a sling would not appropriately address this patient's symptoms. This patient's cast needs to urgently be removed, and fasciotomy needs to be performed.
- Radiography of the limb would reveal the progress in healing of this patient's initial fracture but would do nothing to manage his current presentation.

- Measurement of compartment pressure would not change management in this situation and could falsely guide management. This patient's classic presentation of trauma followed by severe pain with passive movement of the limb warrants emergent fasciotomy regardless of his intracompartment pressure.
- Compartment syndrome presents with severe pain (particularly with passive movement), compartment tenseness, and paresthesias, and the best initial step in management is an emergency fasciotomy.

142. Boxer's fracture is?

a. Radial styloid fracture
b. Reverse Colles fracture
c. 5th metacarpal fracture
d. 1st metacarpal fracture

Ans: c
Ref: Maheshwari Orthopedics 5th Edition Page No: 118

- Monteggia's fracture:- fracture of proximal third of ulna with radial head dislocation
- Galeazzi fracture:- fracture of the distal third of radius with dislocation of distal radio-ulnar joint
- Colles fracture:- fracture of distal end of radius with dorsal tilt
- Smith's fracture:- reverse Colles fracture
- Boxers fracture:- fracture through neck of 5th metacarpal

143. Judet view of X-ray is for?

a. Calcaneum
b. Scaphoid
c. Shoulder
d. Pelvis

Ans: d
Ref: Maheshwari Orthopedics 5th Edition Page No: 369

- Ahlback view: knee
- Brattstrom/skyline view : patella
- Bett's/Clement's view: trapezium
- Kite view: clubfoot
- Judet view : acetabulum (hip)

144. Which of the following is not seen in pseudogout?

a. Small joints affected
b. Large joints affected
c. Chondrocalcinosis
d. Deposition of calcium pyrophosphate

Ans: a
Ref: Harrison 17th Edition, Page No: 216

- Calcium pyrophosphate dihydrate arthropathy
- Commonly involves larger joints. Knee joint most commonly involved. Small joints involvement uncommon
- Age group > 6oyrs

- Radiological hallmark of CPPD "Chondrocalcinosis"

145. An anesthesiologist is preparing a patient for a short surgical procedure. The physician would like to choose a sedating agent that can be given intravenously and will have a quick onset of action and short half-life. Which of the following agents would be ideal for this purpose?

a. Succinylcholine
b. Hydromorphone
c. Sodium thiopental
d. Isoflurane

Ans: c
The best answer choice for an intravenous agent with fast-onset and short half-life would be sodium thiopental.
Sodium thiopental is a short-acting lipid soluble barbiturate. It is often used for short-term induction and maintenance of anesthesia. Thiopental distributes into the body's fatty tissue, causing its effects to wear off quickly. If thiopental is used for perioperative sedation, an analgesic must also be given because thiopental lacks analgesic properties. Thiopental should be used with caution in patients with severe asthma because of the drug's effect on histamine release and in patients with sepsis because the drug can act as a cardiac and respiratory depressant.

- Succinylcholine is a depolarizing paralytic agent often utilized during surgical anesthesia but does not possess analgesic or amnestic properties.
- Hydromorphone is an opioid analgesic that has insufficient sedating or amnestic properties to be used induction or maintenance of anesthesia, though it can be used as an analgesic in combination with thiopental or as a premedication prior to rapid-sequence intubation.
- Isoflurane is an inhaled anesthetic.
- Lidocaine is commonly used as a local anesthetic, but when used intravenously is used as anti arrhythmic and not a general anesthetic.

146. Fish like scale are related to:

a. Psoriasis
b. Pityriasis rosea
c. Ichthyosis
d. Pityriasis lichenoides chronica

Ans: c
Ref: Neena Khanna, 4th Edition, page No: 10
Disease and type of scale

- Psoriasis: Silvery, easily removable
- Pityriasis versicolor: Branny (fine)
- Pityriasis rosea: Collarette
- Ichthyosis: Fish-like
- Pityriasis lichenoides chronica: Mica like, adherent

147. Not a major feature in criteria for Tuberous sclerosis complex:

a. Facial angiofibroma/forehead plaque
b. Confetti multiple dental pits
c. Ungual fibroma

d. Ash leaf macules (≥3)

Ans: b
Ref: Neena Khanna, 4th Edition, page No: 34, 32
Tuberous Sclerosis Complex (TSC)

- Inheritance: AD
- Skin lesions: Pathognomonic skin lesions: angiofibromas (on face), ash leaf macules and shagreen patch (on trunk), Koenen's tumors (periungual fibromas).
- Systemic manifestations: Seizures, mental retardation and eye tumors.
- Treatment: Cosmetic; symptomatic treatment for seizures.

Criteria for diagnosis of TSC:

Major features	*Minor features*
Facial angiofibroma/forehead plaque	Confetti multiple dental pits
Ungual fibroma	Gingival fibromas
Ash leaf macules (≥3)	Rectal polyps
Shagreen patch	Bone cysts
Multiple retinal tumors	
Cerebral tumors	
Renal angiomyolipoma	
Cardiac rhabdomyoma	

Definite TSC: + of either 2 major OR 1 major and 2 minor criteria.
Probable TSC: + of 1 major + 1 minor criteria.
Possible TSC: + of 1 major OR 2 minor criteria.

148. Common location of distribution of blisters in chronic bullous disease of childhood is:

a. Scalp
b. Flexures
c. Peri-orificial
d. Buttocks

Ans: c
Ref: Neena Khanna, 4th Edition, page No: 68

Disease	Distribution
Epidermolysis bullosa	Sites of trauma
Pemphigus vulgaris	Scalp, face, flexures, trunk
Pemphigus foliaceus[2]	Seborrheic distribution
Bullous pemphigoid	Trunk, limb, flexures
Chronic bullous disease of childhood	Around body orifices
Dermatitis herpetiformis	Symmetrical over extensors of trunk including buttocks, elbows, knees.

149. Not a diagnostic criteria for dermatomyositis:

a. Typical skin rash
b. Abnormal muscle biopsy specimen
c. Elevation of skeletal muscle
d. Autoimmune association

Ans: d
Ref: Neena Khanna, 4th Edition, page No: 230
Diagnostic criteria for dermatomyositis

- Typical skin rash
- Symmetric proximal muscle weakness with or without dysphagia or respiratory muscle involvement
- Abnormal muscle biopsy specimen
- Elevation of skeletal muscle-derived enzymes
- Abnormal electromyogram

Confidence limits for diagnosis of dermatomyositis:

- Definite dermatomyositis Rash and three other diagnostic criteria
- Probable dermatomyositis Rash and two other diagnostic criteria
- Possible dermatomyositis Rash and one other diagnostic criteria

150. A 28-year-old woman is voted off the board of her student club for tardiness and incomplete work on the studying group organization. When she arrives home, her husband attempts to console her and she yells at him for constantly criticizing her. Which defense mechanism is the woman using?

a. Intellectualization
b. Projection
c. Displacement
d. Reaction formation

Ans: c
This woman is shifting her negative feelings about her student club board to her husband, which is an example of the defense mechanism displacement.

- Sigmund Freud was a proponent of ego defenses, which are unconscious defense mechanisms in stressful or anxiety-inducing situations. Displacement is an example of an unconscious defense mechanism and such defenses can cause harm to an individual's ability to cope if they are used for a prolonged period of time and depending on the specific circumstances.
- Intellectualization involves the use of intellect to avoid uncomfortable situation, which does not apply in this case.
- Projection entails accrediting one's own feelings to someone else.
- Reaction formation is the defense mechanism in which a person responds to a situation in a manner that is opposite to that person's actual feelings.

151. Bartholin's duct opens into:

a. Labia majora and minora
b. A groove between labia minora and hymen
c. The lower vagina
d. The upper vagina

Ans: b
Ref: Dutta Gynae 5th Ed page no 2

- Bartholin's glands are pea sized oval glands in females homologus to Cowper's Gland in male. The ducts of bartholin gland is 2 cm long and opens into the vestibule outside the hymen at the junction of the anterior2/3rd and posterior 1/3rd in the groove between the hymen and labium minora.
- Duct as well gland is lined by multilayered columnar epithelium (Not by transitional epithelium as is usually stated).
- Function of the gland is to produce abundant alkaline mucus during sexual excitement.

152. Vaginal epithelium is derived from:

a. Endoderm of urogenital sinus
b. Mesoderm of urogenital sinus
c. Endoderm of genital ridge
d. Mesoderm of genital ridge

Ans: a
Development of vagina is composite, partly from the mullerian ducts (paramesonephric ducts) and partly from the urogenital sinus.

Part of vagina	Development
Upper 3/5ths	Mullerian ducts
Lower1/5th	Urogenital sinus
Hymen	Junction of mullerian ducts and urogenital sinus
Epithelium of the vagina and portio vaginalis part of cervix	Endoderm of urogenital sinus
Fibromuscular layer of vagina	Mesoderm of fused caudal part of mullerian ducts
Vaginal introitus	Ectoderm of genital folds

153. In ovarian cycle increased levels of LH are due to:

a. Increased Progesterone
b. Increased Estrogen
c. Increased FSH

d. Increased Androgens

Ans: b
Ref: Shiela Balakrishnan TB of gynae Page No 34
With dramatic increase in estradiol, however there is a change in the LH feedback. There is initial suppression of LH with low levels of oestradiols. It switches to positive feedback when estradiol levels reach 200 pg/ml. These high estrogen levels also increase the production of more bioactive form of FSH and LH. This causes the dramatic bioovulatory LH surge causing 10 fold increase in LH.

154. True about clomiphene citrate is:

a. Enclomiphene has antiestrogenic affect
b. Chance of pregnancy is three fold as compared to placebo
c. Risk of multiple pregnancy is 2–4%
d. It can also be used for male infertility with oligozoospermia

Ans: a
Ref: Shaw 15th Ed page no 314
Clomiphene citrate:

- Clomiphene citrate is the first line intervention for medical induction of ovulation in almost all circumstances, clomiphene acts purely as an antagonist or antiestrogen.

Clomiphene binds and blocks estrogen receptors in hypothalamus (**i.e. antiestrogen**)
↓
Decrease in estrogen negative feedback
↓
Increase GnRH pulses
↓
Ovulation

Clomiphene is a racemic mixture of zuclomiphene enclomiphene. Hence, all actions of clomiphene will be the actions of both these isomers.
Indications:

- Anovulatory infertility in case of PCOS (Stein-Leventhal syndrome), Chiari frommel syndrome.
- Amenorrhea and anovulation following the use of OCP's (Post pill amenorrhea).
- In vitro fertilization, GIFT technique and Assisted Reproduction Technique.

155. Absolute contraindication of hormone replacement therapy is:

a. Thrombosis
b. Fibrocystic disease
c. Fibroadenoma
d. Hemorrhage

Ans: a
Absolute contraindication of HRT:

- **A** = **A**ctive liver disease

- **B** = Undiagnosed vaginal **b**leeding
- **C** = **C**ancers → endometrial/breast
- **D** = **D**VT

156. The most important indication for surgical repair of a bicornuate uterus is:

a. Infertility
b. Dysmenorrhea
c. Menorrhagia
d. Habitual abortion

Ans: d
Ref: Williams Gynae 1st Ed Page No 418

- Surgical reconstruction of the bicornuate uterus has been advocated in women with multiple spontaneous abortions and in whom no other causative factors are identified.
- Surgery done is: Unification surgery (Strassman) where an incision is made over the uterus and the 2 horns are sutured together to form a single cavity.
- After such a surgery: if woman conceives she should be taken up for elective LSCS at 38 weeks of gestation. These days hysteroscopic metroplasty is being done.

157. Which of the following condition does not present with both mullerian and wolffian duct structures?

a. Anti mullerian hormone deficiency
b. FSH receptor mutation
c. Ovotesticular syndrome
d. Mixed gonadal dysgenesis

Ans: b
Anti mullerian hormone deficiency = persistent mullerian duct syndrome = uterine hernia syndrome

- Karyotype is 46 XY
- Since Y chromosome is present gonads are testis, i.e. they are males. In this syndrome, in males – Sertoli cells fail to secrete Mullerian inhibiting substance and Mullerian duct is present.
- Since Leydig cell are also present, they secrete testosterone normally, thus Wolffian duct is also present. So in anti- Mullerian hormone deficiency both mullerian and wolffian ducts are present.
- Ovotestis: It is seen in true hermaphroditism. Both ovaries and testis are present. There is ambiguity of external genitalia. The internal structures depend on the degree of differentiation of the gonads.
- Mixed Gonadal dysgenesis Karyotype = 45XO/46XY.
- In this situation, the gonadal pattern on one side is streak gonad ovary (corresponding to karyotype 45 XO) and a normal testis on the other side (corresponding to karyotype 46 XY)
- In case of FSH receptor mutation in females, Mullerian ducts develop normally, the problem is in the binding of FSH to its receptors. The patient presents with primary or early secondary amenorrhea, variable development of secondary sexual characters and high levels of FSH and LH. Thus here only mullerian duct would be present as the karyotype of females is normal i.e. 46(XX). So, answer to our question is FSH receptor mutation.

158. A 19-year-old girl with painless ulcer in labia majora with everted margins:

a. Treponema pallidum
b. Chlamydia

c. Gonorrhea
d. Herpes genital ulcer disease

Ans: a
The Most common causes of genital ulcers in young, sexual active women are:

- Herpes simplex virus (HSV)
- Treponema Pallidum (syphilis)
- Haemophilus ducreyi (chancroid).

In this case, painless ulcer with everted margin leaves no doubt that the cause of the ulcer is syphilis (Treponema pallidum).

159. During Pomeroy's method of female sterilization, which portion of the tube is ligated?

a. Isthmus
b. Ampulla
c. Infundibulum
d. Cornual

Ans: a
Ref: Dutta Obs 6th Ed page no 553
Pomeroy technique–

- Most commonly done laparotomy method.
- The middle part of tube (3-4 cm away from fundus) is formed into a loop which is tied at the base with catgut and excised.
- Site of ligation—Isthmus.
- Failure Rate = 1 in 300/400 surgeries

160. AP diameter is maximum in which type of pelvis?

a. Platypelloid
b. Android
c. Anthropoid
d. Gynecoid

Ans: c
Ref: Dutta Obs. 8th Ed Page no 403

- Normal female pelvis – Gynaecoid pelvis.
- Male type pelvis – Android pelvis.
- Most common type of pelvis – Gynaecoid pelvis.
- Least common type pelvis – Platypelloid pelvis.
- The only pelvis with AP diameter more than transverse diameter – Anthropoid pelvis.
- Face to pubes delivery is most common in Anthropoid pelvis.
- Direct occipitoposterior position is most common in Anthropoid pelvis.
- Persistent occipitoposterior position is most common in Android pelvis.
- Deep transverse arrest/ Nonrotation/dystocia is most common in Android pelvis.
- Broad flat pelvis – Platypelloid pelvis.
- Transverse diameter is much more than AP diameter – Platypelloid pelvis.

- Engagement by exaggerated posterior asynclitism occurs in Platypelloid pelvis.
- Super subparietal instead of biparietal diameter engages in Platypelloid pelvis

161. The finding of a single umbilical artery on examination of the umbilical cord after delivery is:

a. Insignificant
b. Occurs in 10% of newborns
c. An indicator of considerably increased incidence of major malformation of the fetus
d. Equally common in newborn of diabetic and nondiabetic mothers

Ans: c
Ref: Williams Obs 23rd Ed Page 582
Single Umbilical Artery

- It is seen in 0.7–0.8% cases of single pregnancy and 5% of twin pregnancy
- More common in diabetic patients, black patients, with eclampsia, hydramnios and oligohydramnios, epilepsy patients and in APH.
- Finding of a single umbilical artery is not insignificant and is associated with:
  - Congenital malformations of the fetus in 20–25% cases amongst which cardiovascular and genitourinary anomalies are common.
  - Increased chances of abortion, prematurity, IUGR and perinatal mortality

162. Decidual space is obliterated by:

a. 10th week
b. 12th week
c. 14th week
d. 16th week

Ans: d
Ref: Dutta Obs 7thEd Page no 216
The decidual space (is the space between decidua capsularis and parietalis seen in early pregnancy because the gestational sac does not fill the uterine cavity. By 14-16 weeks gestational sac has enlarged to fill the uterine cavity completely by 4th month (16 weeks).
Note: These 2 layers become atrophied at term whereas decidua basalis retains its characteristic appearance till term

163. Theca lutein cyst is not seen in:

a. Twin pregnancy
b. Molar pregnancy
c. Chronic renal failure during pregnancy
d. Hypothyroidism during pregnancy

Ans: d
Ref: Williams Obs 24th Ed Page no 50
Theca lutein cysts are bilateral cysts seen in ovary associated with markedly elevated levels of hCG.
Conditions of pregnancy where theca lutein cysts are seen:

- Molar pregnancy] – ↑'ed level of hCG
- Diabetes

- Anti. D alloimmunization – large placenta
- Multifetal gestation
- Chronic renal failure – decreased clearance of hCG
- Hyperthyroidism (hCG and TSH–anatomically similar)

164. Bag of membrane ruptures:

a. Before full dilatation of cervix
b. After full dilatation of cervix
c. After head is engaged
d. With excessive show

Ans: b
Ref: Dutta Obs. 7th Ed Page No 130
Membranes usually rupture after full dilatation of cervix or sometimes even beyond, in the second stage.
Early Rupture of Membranes:

- Rupture of membranes any time after the onset of labour but before full dilatation of cervix.
- Premature Rupture of Membrane:
- Rupture of membranes before the onset of labour.
- Sometimes the membranes remain intact until completion of delivery, the fetus is then born surrounded by them and the portion covering the head of the newborn infant is known as the Caul.

165. Not a component of fetal biophysical profile:

a. Non-stress Test (NST)
b. Amniotic fluid index
c. Fetal muscle tone
d. Doppler USG

Ans: d
Ref: Dutta Obstetrics 7th Ed Pg 109
Fetal Biophysical Profile (BPP)—considers several parameters. BPP using real time ultrasonography has a high predictive value. Parameters are:

- Non-stress Test (NST)
- Fetal breathing movements
- Gross body movements
- Fetal muscle tone
- Amniotic fluid

BPP Scoring, interpretation and management		
BPP Score	Interpretation	Management
8–10	No fetal asphyxia	Repeat testing at weekly interval or more
6	Suspect chronic asphyxia	If > 36 weeks → deliver; but If L/S < 2.0 repeat test in 4–6 hours
4	Suspect chronic asphyxia	If ≥ 36 weeks deliver, if < 32 weeks repeat testing in 4–6 hours Test for 120 minutes →
0–2	Strongly suspect asphyxia	

		persistent score ≤ 4→ deliver regardless of gestational age

16. Age of menopause is determined by:

a. Age of menarche
b. Number of pregnancy
c. Age at last pregnancy
d. Genetics

Ans: d
Ref: Dutta Gynecology 6th Ed Pg 57
Age at which menopause occurs is genetically predetermined. The age of menopause is not related to age of menarche or age at last pregnancy. It is also not related to number of pregnancy, lactation, use of oral pill, socioeconomic condition, race, height or weight. Thinner women have early menopause. However, cigarette smoking and severe malnutrition may cause early menopause. The age of menopause ranges between 45–55 years, average being 50 years.

167. All of the following are contraindications to tocolysis except:

a. Chorioamnionitis
b. Fetal distress
c. Anencephaly
d. Placenta previa

Ans: d
Ref. Dutta Obs. 7th Ed Pg 319
Contraindications to tocolysis

- Chorioamnionitis
- Preeclampsia/eclampsia
- Advanced labor
- Fetal distress
- Abruption
- IUFD
- Congenital anomalies not compatible with life
- Pregnancy >34 weeks

As far as placenta previa is concerned tocolysis is not contraindicated
Management of patient with placenta previa and preterm labor:
Tocolytic agent: "Uterine contractions are common in patients with placenta previa. Since uterine contractions have the potential to, disrupt the placental attachment and aggravate the bleeding, most obstetricians favor the use of tocolytic agents in the expectant management of patient with placenta previa". - High risk pregnancy Fernando arias
Most commonly used tocolytic in case of placenta previa:

- Nifedipine
- Magnesium sulphate

Tocolytic which are not used:

- Terbutaline and Ritodrine: They cause tachycardia and make the assessment of patient's pulse rate unreliable.
- Indomethacin: It causes inhibition of platelet cyclo oxygenase system and prolongs the bleeding time.

168. In pregnancy which clotting factor is decreased?

a. Factor II
b. Factor V
c. Factor VIII
d. Factor XI

Ans: d
Ref: Dutta obstetrics; 8th edition; Page No 59

BLOOD COAGULATION FACTORS:

- Pregnancy is a hypercoagulable state. Fibrinogen level is raised by 50% from 200–400 mg/dL in nonpregnant to 300–600 mg/dL in pregnancy. As a result of rise in fibrinogen and globulin level and diminished blood viscosity, erythrocyte sedimentation rate (ESR) gives a much higher value (fourfold increase) during pregnancy. As such, ESR has got little diagnostic value in pregnancy.
- Platelets count, however, gives a conflicting picture. Recent studies show a static or a slight fall to the extent of 15% of prep regnant level.
- Gestational thrombocytopenia may be due to hemodilution and increased platelet consumption.
- Fibrinolytic activity is depressed till 15 minutes after delivery. **There is increase in activities of clotting factors like X, IX, VIII, VII and I. The levels of II, V and XII are either unchanged or mildly increased. The level of factors XI and XIII are slightly decreased.** The clotting time does not show any significant change. These are all effective to control blood loss and hemostasis after the separation of placenta. Levels of coagulation factors normalize 2 weeks postpartum. Leukocyte levels return to normal within 1–12 weeks of delivery.

169. Which one of the following is clean surgery?

a. Hernia surgery
b. Gastric surgery
c. Cholecystectomy
d. Rectal surgery

Ans: a
Ref: Bailey & Love's surgery 26th Ed Pg 63
Surgical site infection (SSI) rates relating to wound contamination.

Type of surgery	Infection rate (%)	Rate before prophylaxis
Clean (no viscus opened)	1–2	The same
Clean-contaminated (viscus opened, minimal spillage)	<10	Gastric surgery up to 30% Biliary surgery up to 20%
Contaminated (open viscus with spillage or inflammatory disease)	15–20	Variable but up to 60%
Dirty (pus or perforation, or incision through an abscess)	<40	Up to 60% or more

a. Clean wound

- Herniorrhaphy.
- Excisions.

- Surgeries of the brain, joints, heart, transplant. Infective rate is less than 2%.

b. Clean contaminated wound
- Appendicectomy.
- Bowel surgeries, gastrojejunostomy.
- Gallbladder, biliary and pancreatic surgeries. Infective rate is 10%.

c. Contaminated wound
- Acute abdominal conditions. Open fresh accidental wounds. Infective rate is 15–20%

d. Dirty infected wound
- Abscess drainage.
- Pyocele.
- Empyema gallbladder. Faecal peritonitis.
- Infective rate is 40–70%.

170. Histological variety of breast carcinoma with best prognosis is:

a. Medullary
b. Colloid
c. Lobular
d. Tubular

Ans: d
Ref: Bailey & Love 26th Ed Pg 811

Group	Approximate 5-year survival rate (%)	Example	Treatment
'Very low-risk' primary breast cancer	>90	Screen-detected DCIS, tubular or special types	Local
'Low-risk' primary breast cancer	70–90	Node negative with favourable histology	Locoregional with/without systemic
'High-risk' primary breast cancer	<70	Node positive or unfavourable histology	Locoregional with systemic
Locally advanced	<30	Large primary or inflammatory	Primary systemic
Metastatic	–	–	Primary systemic

Table: Prognostic Classification of breast carcinoma

Mucinous Carcinoma (Colloid Carcinoma)
- Special-type breast cancer, accounts for 2% of all invasive breast cancers
- Typically presents in the elderly population as a bulky tumor.
- Characterized by extracellular pools of mucin
- Analysis of multiple sections is essential to confirm the diagnosis
- LN metastases occur in 33% of cases, and 5- and 10-year survival rates are 73 and 59%, respectively.

Papillary Carcinoma
- Special-type cancer of the breast that accounts for 2% of all invasive breast cancers.
- Presents in the 7th decade of life and occurs in a disproportionate number of nonwhite women.
- Typically small and rarely attain a size of 3 cm in diameter.
- Defined by papillae with fibrovascular stalks and multilayered epithelium.

- Low frequency of axillary LN metastases and had 5- and 10-year survival rates similar to those for mucinous and tubular carcinoma.

Tubular Carcinoma

- Special-type breast cancer and accounts for 2% of all invasive breast cancers.
- Usually diagnosed in the perimenopausal or early menopausal periods.
- Distant metastases are rare in tubular carcinoma with long-term survival approaches 100%.

Invasive Lobular Carcinoma

- Accounts for 10% of breast cancers.
- Invasive lobular carcinoma is frequently multifocal, multicentric, and bilateral.

171. The following statements are true about Peyronie's disease except:

a. Patient presents with complaints of painful erection
b. Condition affects adolescent males
c. The condition can be associated with Dupuytren's contracture of the tendon of the hand
d. Spontaneous regression occurs in 50% of the cases

Ans: b
Ref: Bailey and Love 26th Edition, Page No: 1372
Peyronie's Disease

- Peyronie's disease (plastic induration of penis/ penile fibromatosis) usually seen over 40 years of age.
- It is due to fibrous plaques in one or both corpus cavernosum of varying sizes involving tunica albuginea which may later calcify or ossify.
- Cause remains obscure; the dense fibrous plaque is microscopically consistent with findings of severe vasculitis.
- Palmar fibromatosis (Dupuytren's contracture), plantar fibromatosis and penile fibromatosis (Peyronie's disease) are components of the same pathological process called superficial fibromatosis.

Clinical Features

- Painful erection, curvature of penis and poor erection distal to involved area.
- No pain when the penis is in non erect state.
- Palpable induration or mass appears usually on the dorsolateral aspect of the penis.

Treatment

- Spontaneous remission occurs in about 50% cases, so observation and emotional support advised initially.
- If the penile deformity is distressing, Nesbitt's operation can be performed to straighten the penis.
- Nesbitt operation: Straightening of penis by placing non-absorbable sutures in corpus cavernosum opposite to the plaque.

172. Bascom technique is applied for treatment of:

a. Rectal prolapse
b. Anal incontinence
c. Pilonidal sinus
d. Fistula-in-ano

Ans: c
Ref: Bailey and Love 27th Edition, Page No: 1348-1349
Surgical treatment of chronic pilonidal disease

- The multitude of surgical procedures advocated to eradicate pilonidal disease, combined with the lack of prospective trials, attests to the lack of overall superiority of one method over the others. Time spent off work and perceived recurrence rates, but more usually surgeon preference, influence the choice of method, which includes the laying open of all tracks with or without marsupialization, the excision of all tracks with or without primary closure and the excision of all tracks and then closure by some other means designed to avoid a midline wound (Limberg procedure, Z-plasty, Karydakis procedure.
- **Bascom's procedure** involves an incision lateral to the midline to gain access to the sinus cavity, which is rid of hair and granulation tissue and excision and closure of the midline pits. The lateral wound is left open Irrespective of procedure, postoperative wound care is important and centers around elimination of hair (ingrown, local or other) from the wound. The search for an ideal surgical treatment modality for pilonidal disease is still ongoing, the most essential characteristic being tension-free healing.

Recurrent pilonidal sinus

Three possibilities account for this disappointment:

- part of the sinus complex has been overlooked at the primary operation;
- new hairs enter the skin or the scar;
- There is persistence of a midline wound caused by shearing forces and scarring; in this situation, revisional surgery may include re-excision followed by wound closure and obliteration of the natal cleft, either by myocutaneous rotational buttock flap or cleft closure (Bascom).

173. The mesentric cyst:

a. Moves parallel to mesentery
b. Moves perpendicular to mesentery
c. Is common in children
d. Is fixed and immobile

Ans: b
Ref: Bailey and Love 27th Edition, Page No: 1063
Mesenteric cysts

Clinical features

- Cysts occur most commonly in adults with a mean age of 45 years
- Twice as common in women as in men
- Rare: incidence around 1 per 140 000
- Approximately a third of cases occur in children younger than 15 years
- The mean age of children affected is 4.9 years
- The most common presentation is of a painless abdominal swelling with characteristic physical signs there is a fluctuant swelling near the umbilicus the swelling moves freely **in a plane at right angles to the attachment of the mesentery (Tillaux's sign**) there is a zone of resonance around the cyst.
- Other presentations are with recurrent attacks of abdominal pain with or without vomiting (pain resulting from recurring temporary impaction of a food bolus in a segment of bowel narrowed by the cyst or possibly from torsion of the mesentery) and acute abdominal catastrophe, due to torsion of that portion of the mesentery containing the cyst rupture of the cyst, often as a result of a comparatively
- Trivial accident hemorrhage into the cyst infection.

174. An adult whose both lower limbs are charred along with genitalia has---------- burns:

a. 18%

b. 19%
c. 36%
d. 37%

Ans: d
Ref: SRB Surgery 4th Edition, Page No: 128

Rule of Nine (Wallace's rule of "9") 1951			
	Adults	*Children*	*Infants*
Head and neck	9%	18%	20%
Front of chest and abdominal wall	9 × 2 = 18%	18%	10 × 2 = 20%
Back of chest and abdominal wall	9 × 2 = 18%	18%	10 × 2 = 20%
Lower limb	18 × 2 = 36%	13.5 × 2 = 27%	10 × 2 = 20%
Upper limb	9 × 2 = 18%	18%	10 × 2 = 20%
Perineum	01%	01%	
	100%	**100%**	**100%**

Note: It is head and lower limb percentage which differ in adults and children.

175. Which one of the following is not a part of the Revised Trauma score?

a. Glasgow coma scale
b. Systolic blood pressure
c. Pulse rate
d. Respiratory rate

Ans: c
Ref: SRB Surgery 4th Edition, Page No: 140

Revised Trauma Score (RTS)

- It is a reliable physiological scoring system in trauma. Here Glasgow coma scale, systolic blood pressure, respiratory rate are used as parameters.
- RTS = 0.9368 × GCS + 0.7326 × systolic BP + 0.2908 × Respiratory rate.
- RTS will come between 0–7.8.
- Value <4 needs critical care.

176. Stemmer's sign is due to?

a. Lipodystrophy
b. Retroperitoneal fibrosis
c. Subcutaneous fibrosis
d. Deep vein thrombosis

Ans: c
Ref: Bailey and Love 27th Edition, Page No: 998

- Stemmer's sign is seen in lymphoedema.
- Skin on the dorsum of the toes cannot be pinched due to subcutaneous fibrosis.
- This is called Stemmer's sign.

177. A 21-year-old female presents to her obstetrician because she has stopped getting her period, after being irregular for the last 3 months. Upon further questioning, the patient reveals that she has had a 17 lb. unintended weight loss, endorses chronic diarrhea, abdominal pain, and constipation that waxes and wanes. Family history is notable only for an older brother with Type 1 Diabetes. She is healthy, and is eager to gain back some weight. Her OBGYN refers her to a gastroenterologist, but first sends serology laboratory studies for IgA anti-tissue transglutaminase antibodies (IgA-tTG). These results come back positive at > 10x the upper limit of normal. Which of the following is the gastroenterologist likely to find on endoscopy and duodenal biopsy?

a. Cobblestoning with biopsy showing transmural inflammation and non caseating granulomas
b. Friable mucosal pseudopolyps with biopsy notable for crypt abscesses
c. Normal appearing villi and biopsy
d. Villous atrophy with crypt lengthening and intraepithelial lymphocytes

Ans: d

This patient presents with signs of malabsorption, and secondary amenorrhea. Her high IgA-tTG titers are very sensitive and specific for Celiac disease (CD), making her endoscopic findings likely to be villous atrophy, crypt lengthening and intraepithelial lymphocytes.

CD is an autoimmune mediated intolerance to gluten, a protein found in wheat, rye, and barley. It is a genetically predisposed condition, with a high correlation in individuals with HLA-DQ2 and HLA-DQ8. Prevalence is estimated in the 1% in the general population, and a coincidence of 3-6% in individuals with type 1 diabetes. Individuals present with abdominal symptoms, including chronic constipation, pain, nausea, vomiting, flatulence, especially after consumption of high gluten foodstuffs. Diagnosis is accomplished through positive CD serology and confirmatory small-bowel biopsy.

178. Which of the following is true regarding hereditary pancreatitis?

a. Autosomal recessive disorder
b. Has 80% Penetrance
c. IgG4 concentrations are elevated
d. All of the above

Ans: b

Ref: Bailey and love 27th edition pg 1230

- Hereditary pancreatitis is **an autosomal dominant** disorder with **an 80% Penetrance**, associated with a gain-of function mutation in the cationic trypsinogen gene (PRSS1) on chromosome 7, which leads to production of a degradation resistant form of trypsin. A loss-of-function mutation in SPINK1 also predisposes to idiopathic pancreatitis. Some patients with idiopathic chronic pancreatitis have mutations in the CFTR gene. Idiopathic chronic pancreatitis accounts for approximately 30% of cases and has been subdivided into early-onset and late-onset forms.
- **IgG4 concentrations are elevated in autoimmune pancreatitis**.

179. A patient presented with features of hypercalcemia, visual problems and peptic ulcer.The inheritance pattern of disease is:

a. Autosomal dominant
b. Autosomal recessive
c. X-linked recessive
d. Mitochondrial

Ans: a
Ref: Sabiston surgery, 20th edition; page no 998

- Features of hypercalcemia (Hyperparathyroidism), visual problems (pituitary adenoma) and peptic ulcer (pancreatic tumors- Zollinger Ellison syndrome) suggest diagnosis of Multiple Endocrine Neoplasia (MEN1)
- The clinical feature that develops in more than 90% of individuals with a *MEN1* mutation is **hyperparathyroidism** due to multiglandular parathyroid neoplasms. Patients with MEN1 also develop **NETs of the pancreas** and duodenum, bronchial and thymic carcinoids, and **adenomas of the anterior pituitary** with lesser frequency
- Males and females are affected equally with MEN1, as predicted by the **autosomal dominant** inheritance pattern.

180. The triangle is bounded by the lines connecting the cystic duct, the junction between the second and third portions of the duodenum, and the junction between the neck and body of the pancreas. Which of the following tumors does the above mentioned triangle harbor most commonly?

a. Insulinoma
b. Gastrinoma
c. Carcinoid
d. Lymphoma

Ans: b
Ref: Sabiston surgery,20th edition; page no 954

- Of gastrinomas, 90**% are located within the gastrinoma triangle**, bounded by the lines connecting the cystic duct, the junction between the second and third portions of the duodenum, and the junction between the neck and body of the pancreas
- More than 60% are located in the duodenum with most arising in the first portion. Gastrinomas are occasionally localized to lymph nodes in this region, and it is unclear whether lymph nodes can be a true primary site for gastrinoma or whether they represent metastases from occult primary tumors in the duodenum or pancreas.

181. The feature of petit mal epilepsy in EEG is:

a. Spike and dome
b. Continuous stunted spikes
c. Waves at the rate of 10/sec
d. Continuous tall spikes

Ans: a
Ref: Ghai Pediatrics 8th Ed Pg 557
Absence seizures (petit mal):

- EEG shows a characteristic 3 per second spike and slow wave pattern. Absence fits are distinguished from complex partial seizures by shorter duration (10 seconds), absence of aura and abrupt return of full consciousness.
- Absence seizures start abruptly in childhood; the peak prevalence is between 6-8 yr. Absence seizures are not preceded by aura. The patients have a brief abrupt lapse of awareness or consciousness, sudden discontinuation of the activity being performed with staring spell, eye fluttering, or rhythmic movements. The seizure lasts less than 30 seconds. There is no loss of posture, incontinence of urine/ stools or breathing difficulty. Other neurological manifestations and postictal phenomena are absent and development is normal.
- Hyperventilation for 3 min often precipitates the attacks. Absence seizures may occur in multiples, everyday. Attacks following in close succession indicate *petit ma/* status or *pyknolepsy.*

182. ASD is associated with all except -

a. Infective endocarditis
b. heart failure
c. Arrhythmia
d. Pulmonary hypertension

Ans: a
Ref: OP Ghai Pediatrics 9th Edition, Page No: 411,414
Infective endocarditis or endarteritis (IE) Endocarditis can complicate CHD, especially in patients with significant turbulence created by high-pressure gradients, e.g. restrictive VSD and PDA, tetralogy of Fallot, and left ventricular outflow tract obstruction. Some surgical operations (such as the Blalock-Taussig shunt) are also associated with increased risk of IE or endarteritis. Lesions with little or no turbulent flows, such as ASD are not associated with increased risk.
Natural History and Complications of ASD
Heart failure is exceptional in infancy. A small proportion of patients might develop pulmonary hypertension, by-the second or third decade. ASD closure is recommended to prevent complications of atrial arrhythmias and heart failure in late adulthood.

183. Scaphocephaly is due to premature closure of the -

a. Coronal suture
b. Metopic suture
c. Sagittal suture
d. Lambdoid suture

Ans: c
Ref: OP Ghai Pediatrics 8th Edition, Page No: 41
The common forms of craniosynostosis (secondary to premature fusion of sutures) include

- trigonocephaly (metopic suture)
- brachycephaly (bilateral coronal sutures)
- left anterior plagiocephaly (left coronal suture)
- scaphocephaly (sagittal suture)
- right posterior plagiocephaly (right lambdoid suture)

184. Wide fix S2 seen in:

a. ASD
b. VSD
c. PDA
d. All

Ans: a
Ref: Nelson pediatrics, 20th Edition, Page No: 2190

- The physical findings of an ASD are usually characteristic but fairly subtle and require careful examination of the heart, with special attention to the heart sounds. Examination of the chest may reveal a mild left precordial bulge. A right ventricular systolic lift may be palpable at the left sternal border.

- Sometimes a pulmonic ejection click can be heard. In most patients with an ASD, the characteristic finding is that the 2nd heart sound is **widely split and fixed** in its splitting during all phases of respiration. Normally, the duration of right ventricular ejection varies with respiration, with inspiration increasing right ventricular volume and delaying closure of the pulmonary valve. With an ASD, right ventricular diastolic volume is constantly increased and the ejection time is prolonged throughout all phases of respiration.
- A systolic ejection murmur is heard; it is medium pitched, without harsh qualities, seldom accompanied by a thrill, and best heard at the left middle and upper sternal border. It is produced by the increased flow across the right ventricular outflow tract into the pulmonary artery, not by low-pressure flow across the ASD. A short, rumbling mid diastolic murmur produced by the increased volume of blood flow across the tricuspid valve is often audible at the lower left sternal border. This finding, which may be subtle and is heard best with the bell of the stethoscope, usually indicates a Qp:Qs ratio of at least 2 : 1.

185. Grisel syndrome is:

a. Glucosaminidase deficiency
b. Atlantoaxial dislocation
c. Hexosaminidase deficiency
d. L4-L5 displacement

Ans: b
Ref: Nelson pediatrics, 20th Edition, Page No: 3298
Grisel syndrome is a rare cause of torticollis that involves subluxation of atlanto-axial joint from inflammatory ligamentous laxity following an infectious process in the head and neck, usually a retropharyngeal abscess.

186. WPW syndrome is associated with:

a. TOF
b. VSD
c. Ebstein anomaly
d. TAPVC

Ans: c
Ref: Nelson pediatrics, 20th Edition, Page No: 2221-2222
Ebstein anomaly consists of downward displacement of an abnormal tricuspid valve into the right ventricle.
Clinical manifestations

- The severity of symptoms and the degree of cyanosis are highly variable and depend on the extent of displacement of the tricuspid valve and the severity of right ventricular outflow tract obstruction.
- In many patients, symptoms are mild and may be delayed until the teenage years or young adult life; the patient may initially have fatigue or palpitations as a result of cardiac dysrhythmias. The atrial right-to-left shunt is responsible for cyanosis and polycythemia. Jugular venous pulsations,
- a index of central venous pressure, may be normal or increased in those with tricuspid insufficiency. On palpation, the precordium is quiet.
- A holosystolic murmur caused by tricuspid regurgitation is audible over most of the anterior left side of the chest. A gallop rhythm is common and often associated with multiple clicks at the lower left sternal border. A scratchy diastolic murmur may also be heard at the left sternal border. This murmur may mimic a pericardial friction rub.

- Newborns with severe forms of Ebstein anomaly have marked cyanosis, massive cardiomegaly, and long holosystolic murmurs. Death may result from cardiac failure, hypoxemia, and pulmonary hypoplasia, the result of severe long-standing intrauterine right atrial enlargement.
- Spontaneous improvement may occur in some neonates as pulmonary vascular resistance falls and improves the ability of the right ventricle to provide pulmonary blood flow. The majority are dependent on a PDA, and thus on a prostaglandin infusion, for pulmonary blood flow.

Diagnosis

The electrocardiogram usually shows a right bundle-branch block without increased right precordial voltage, normal or tall and broad P waves, and a normal or prolonged P-R interval. **Wolff-Parkinson White syndrome** may be present and these patients may have episodes of **supraventricular tachycardia**. On radiographic examination, heart size varies from slightly enlarged to massive box shaped cardiomegaly caused by enlargement of the right atrium. In newborns with severe Ebstein anomaly, the heart may totally obscure the pulmonary fields. Echocardiography is diagnostic and shows the degree of displacement of the tricuspid valve leaflets, a dilated right atrium, and any right ventricular outflow tract obstruction.

187. A child Says song or poem; tells stories, at age of:

a. 3 yr
b. 4 yr
c. 5 yr
d. 6 yr

Ans: b

Ref: OP Ghai 8th edition pg 53

Key language milestones

Age	*Milestone*
1 mo	Alerts to sound
3 mo	Coos (musical vowel sounds)
4 mo	Laugh loud
6 mo	Monosyllables (ba, da, pa), ah-goo sounds
9 mo	Bisyllables (mama, baba, dada)
12 mo	1–2 words with meaning
18 mo	8–10 word vocabulary
2 yr	2–3 word sentences, uses pronouns " I", "me", "you"
3 yr	Asks questions; knows full name and gender
4 yr	Says song or poem; tells stories
5 yr	Asks meaning of words

188. A child presents with hepatosplenomegaly, abdominal distension, jaundice, steatorrhea and adrenal calcification. Which of the following is the diagnosis?

a. Adrenal hemorrhage
b. Addison's disease
c. Wolman's disease
d. Pheochromocytoma

Ans: c

Ref: Nelson pediatrics 20th edition pg 714
WOLMAN DISEASE AND CHOLESTEROL ESTER STORAGE DISEASE
These are autosomal recessive lysosomal storage diseases that result from the deficiency of acid lipase and the accumulation of cholesterol esters and triglycerides in Histiocytic foam cells of most visceral organs. The gene for lysosomal acid lipase is on chromosome 10 (10q24-q25). Wolman disease is the more severe clinical phenotype and is a fatal disorder of infancy. Clinical features become apparent in the first weeks of life and include failure to thrive, relentless vomiting, **abdominal distention, steatorrhea**, and **hepatosplenomegaly**.
There usually is hyperlipidemia. **Hepatic dysfunction** and fibrosis may occur. **Calcification of the adrenal glands occurs in about 50% of patients**. Death usually occurs within the first 6 mo of life.

189. Which phase of treatment of ALL focuses on CNS therapy?

a. Remission induction
b. Consolidation
c. Intensification
d. Maintenance

Ans: b
Ref: Nelson's textbook of pediatrics,20th edition ,page no 2440

- Initial therapy, termed remission induction, is designed to eradicate the leukemic cells from the bone marrow
- The second phase of treatment, consolidation, focuses on intensive CNS therapy in combination with continued intensive systemic therapy in an effort to prevent later CNS relapses
- Subsequently, many regimens provide 14-28 wk of therapy. This period of treatment is often termed intensification including (delayed intensification) ans (interim maintenance).
- Finally, patients enter the maintenance phase of therapy, which lasts for 2-3 yr, depending on the protocol used.

190. A child is found to be wasted on examination. Wasting is defined as:

a. Low weight for age
b. Low height for age
c. Low weight for height
d. None of the above

Ans: c
Ref: OP Ghai Pediatrics 9th Edition, Page No: 94

- Low weight for age →underweight
- Low height for age→stunting
- Low weight for height→**wasting**

191. A 81-year-old man presents to his cardiologist for ongoing management of mild heart failure. He has not had any changes in his cardiac function status and says that he is tolerating lisinopril without any major side effects. During the course of the visit, the patient says that he is unhappy with his urologist because he has been experiencing episodes of dizziness after starting prazosin for benign prostatic hyperplasia. He says that he feels these episodes were caused by malpractice on his urologist's behalf and is considering a lawsuit against his urologist. Which of the following is the most appropriate course of action for the cardiologist?

a. Call the urologist and warn him of an impending lawsuit
b. Call the urologist to convey the patient's dissatisfaction

c. Contact his insurance agent to discuss possible risks
d. Encourage the patient to speak with his urologist directly

Ans: d
This patient who is experiencing episodes of dizziness after starting prazosin is most likely experiencing a common side effect of this medication. Therefore, the cardiologist should try to preserve the patient's relationship with his urologist by encouraging him to speak with the urologist directly.

- Physicians should encourage open communication between patients and other treating physicians. When the treatments chosen are reasonable, they should attempt to preserve the patient's relationship with his or her other health care providers. Nonetheless, ensuring the patient is receiving the best available care is the first priority, so if a mistake is discovered the physician should disclose that to the patient. Even if this mistake results in a malpractice lawsuit, physicians are expected to protect the patient from adverse outcomes if inappropriate care is being delivered by another healthcare provider.
- Calling the urologist and warning him of an impending lawsuit is incorrect because this would not be placing the patient's best interests first.
- Calling the urologist to convey the patient's dissatisfaction is incorrect because this would be in violation of the patient's right to confidentiality. The physician should instead encourage the patient to contact the provider directly.
- Contacting his insurance agent to discuss possible risks is incorrect because the cardiologist should look out for the patient's best interests first. The patient has also not expressed any dissatisfaction with the cardiologist.
- Doctors should try to preserve patient's relationships with other providers as long as the care being provided is appropriate.

192. A 3-year-old child is brought to the Kanti Children Hospital by his mother who states that he has been fussy for the past two days. She says that he has had a runny nose, a cough, a sore throat, and decreased appetite. Vital signs are within normal limits. Physical exam reveals a slightly erythematous oropharynx and clear nasal discharge. The mother states that she is a single mother working at a busy law firm. The mother demands that the child receive antibiotics, as her babysitter refuses to care for the child unless he is treated with antibiotics. You diagnose the child with the common cold and inform the mother that antibiotics are not indicated. She is infuriated and accuses you of refusing to treat her child appropriately. How should you respond?

a. Prescribe antibiotics to the child
b. Refer the mother to a nearby physician who will prescribe antibiotics
c. Prescribe a placebo
d. Explain the reasoning as to why antibiotics are not indicated for the common cold

Ans: d
When a patient makes an inappropriate request from a physician, the physician should maintain professionalism and respond firmly and politely.

- Patients often make inappropriate requests from their physicians, often based on fear or misunderstanding. If these requests are denied, patients can often become angry and frustrated. A physician should maintain a professional atmosphere at all times and offer an explanation to their decision. Although at times it may seem as an easy way to appease the patient, it is important that they not give in to inappropriate requests.
- Antibiotics are not indicated and may be harmful to the child.
- Referring the patient to a nearby physician would be inappropriate. The physician should remain professional and calmly explain to the mother the reason why antibiotics are not indicated.

- Prescribing a placebo would be inappropriate as it would violate the patients trust. The physician should remain professional and calmly explain to the mother the reason why antibiotics are not indicated.

193. Not a component of Rational use of medicines:

a. Appropriate to clinical needs
b. Doses that meet own individual requirements
c. For a minimum period of time
d. At the lowest cost to them and their community

Ans: c
Rational use of medicines requires that "patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community".

194. A 21 year old unmarried girl is 8 months pregnant, and she requests you for abortion. What would you do?

a. Ask her to bring her father with her
b. Ask her to bring her boy-friend or husband with her
c. Counsel her about the possible options of abortion
d. Counsel her about the health hazards and legal constraints with this.

Ans: d
Abortion law update Nepal
Ref: Lawcommission Gov website

The Right to Safe Motherhood and Reproductive Health Act, 2075 (2018)
Chapter 4: Safe Abortion
To perform safe abortion: A pregnant woman shall have the right to get safe abortion performed in any of the following circumstances:

- Fetus (gestation) up to twelve weeks, with the consent of the pregnant woman,
- Fetus (gestation) up to twenty-eight weeks, as per the consent of such woman, after the opinion of the licensed doctor that there may be danger upon the life of the pregnant woman or her physical or mental health may deteriorate or disabled infant may be born in case the abortion is not performed,
- Fetus (gestation) remained due to rape or incest, fetus (gestation) up to twenty-eight weeks with the consent of the pregnant woman,
- Fetus (gestation) up to twenty-eight weeks with the consent of the woman who is suffering from H.I.V. or other incurable disease of such nature,
- Fetus (gestation) up to twenty eight weeks with the consent of the woman, as per the opinion of the health worker involved in the treatment that damage may occur in the womb due to defects occurred in the fetus (gestation), or that there is such defect in the fetus of the womb that it cannot live even after the birth, that there is condition of disability in the fetus (gestation) due to genetic defect or any other cause.

195. You are under service of Nepal government, and a letter is issued for you to serve the checkpoint at Tribhuvan International Airport to screen travelers against possible Corona virus infection. What would you do?

a. Refuse the offer and leave the job
b. Seek family advice

c. Accept the job and go to job
d. Enquire about personal safety and accept the job

Ans: d
Protection and safeguarding yourself is equally important as service.

196. Regarding surgical site infection, WHO says:
a. Surgery always involves risk and the risk of infection.
b. Risk is generally highest in low- and middle-income countries.
c. There is a clear benefit to not removing hair, or if absolutely necessary, to just clipping it instead of shaving.
d. All are true

Ans: d
Ref: WHO Official website
- Surgery always involves risk and the risk of infection can never be completely eliminated. Risk is generally highest in low- and middle-income countries, because of insufficient equipment, staffing and poor infrastructure, as well as lack of policies and knowledge, for example.
- Removing hair from the intended site of surgical incision has traditionally been part of the routine preparation for surgery, and has been considered necessary to facilitate adequate exposure, skin marking and suturing. However, hair removal can increase the risk of infection by causing microscopic trauma of the skin (i.e. cuts). The evidence now tells us that there is a clear benefit to not removing hair, or if absolutely necessary, to just clipping it instead of shaving.

197. CPR is vital in which of the following conditions:
a. Ventricular fibrillation (VF)
b. Pulseless ventricular tachycardia (VT)
c. Pulseless electrical activity (PEA)
d. All of the above

Ans: d
CPR should be performed immediately on any person who has become unconscious and is found to be pulseless. Assessment of cardiac electrical activity via rapid “rhythm strip” recording can provide a more detailed analysis of the type of cardiac arrest, as well as indicate additional treatment options.
Loss of effective cardiac activity is generally due to the spontaneous initiation of a nonperfusing arrhythmia, sometimes referred to as a malignant arrhythmia.
The most common non-perfusing arrhythmias include the following:
- Ventricular fibrillation (VF)
- Pulseless ventricular tachycardia (VT)
- Pulseless electrical activity (PEA)
- Asystole
- Pulseless bradycardia

198. Push hard and fast is for:
a. Ventilation
b. Pressor injection

c. Chest compression
d. Travel to nearest safe venue

Ans: c

Chest compression in CPR

- The provider should do the following:
- Place the heel of one hand on the patient's sternum and the other hand on top of the first, fingers interlaced
- Extend the elbows and the provider leans directly over the patient (see the image below)
- Press down, compressing the chest at least 2 in
- Release the chest and allow it to recoil completely
- The compression depth for adults should be at least 2 inches (instead of up to 2 inches, as in the past)
- The compression rate should be at least 100/min
- **The key phrase for chest compression is, "Push hard and fast"**
- Untrained bystanders should perform chest compression–only CPR (COCPR)
- After 30 compressions, 2 breaths are given; however, an intubated patient should receive continuous compressions while ventilations are given 8-10 times per minute
- This entire process is repeated until a pulse returns or the patient is transferred to definitive care
- To prevent provider fatigue or injury, new providers should intervene every 2-3 minutes (ie, providers should swap out, giving the chest compressor a rest while another rescuer continues CPR

199. A 22-year-old man comes to the clinic to discuss the results of an HIV immunoassay done 1 week ago. At that time, he was also diagnosed with syphilis, and intramuscular penicillin was administered. He has no other history of serious illness and no known drug allergies. He takes no other medications. He had never previously undergone HIV testing. He has had sexual intercourse with six male sexual partners in his lifetime; they have used condoms inconsistently. Vital signs are within normal limits. Physical examination shows a resolving, painless chancre over the penis. He is informed that the HIV immunoassay results are positive. Which of the following is the most appropriate statement by the physician to the patient at this time?

a. "At this time, we recommend antiretroviral therapy for all HIV-infected patients. This needs to be taken consistently for the rest of your life. Are you ready to start therapy today?"
b. "I noticed that you had never been tested for HIV before last week, although you were at high risk for infection. Why is that?"
c. "Pre-exposure prophylaxis is very effective in preventing HIV infection. Had you ever considered using it?"
d. "What are your thoughts and feelings about this HIV test result?"

Ans: d

Always start communication from patients thoughts and feelings about a diagnosis and results. Do not impose the severity of the disease on patients.

200. You are late to office and your scheduled patient is very angry on you. What would you do?

a. Refuse to see the patient
b. Tolerate for a while, and then show attitude to him because you were late for genuine reason
c. Apologize and try to explain why you were late
d. Call hospital director to settle the issue

Ans: c

Patient comfort and priority should be kept at first. Communication skill is very vital during handling angry and unsatisfied patient. Always try to explain the facts, rather than being angry in such situation.

NEXT MD/MS BASED ENTRANCE

11:00 AM, Chaitra 1, 2076 (Saturday): Online & Written Both [CEE BASED]

07:00 PM, Falgun 26, 2076 (Monday): Online Only [COMMUNITY MEDICINE-SUBJECT WISE]

07:00 PM, Falgun 28, 2076 (Wednesday): Online Only [CEE BASED]

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