UPSC MEDICO

# SAMPLE NOTES

## MEDICAL SCIENCE OPTIONAL

EDITION 3.0

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# Understand Better. Revise Faster. Reproduce Better.

## UPSC MEDICO | EDITION 3.0

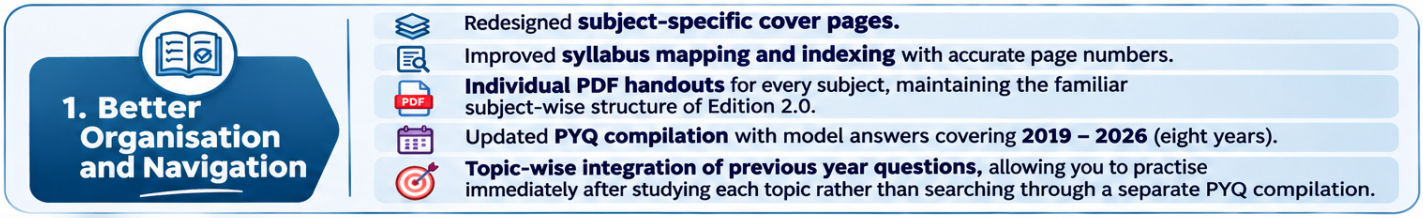
More than updated notes — a refined approach to learning, revision and answer writing for Medical Science Optional.

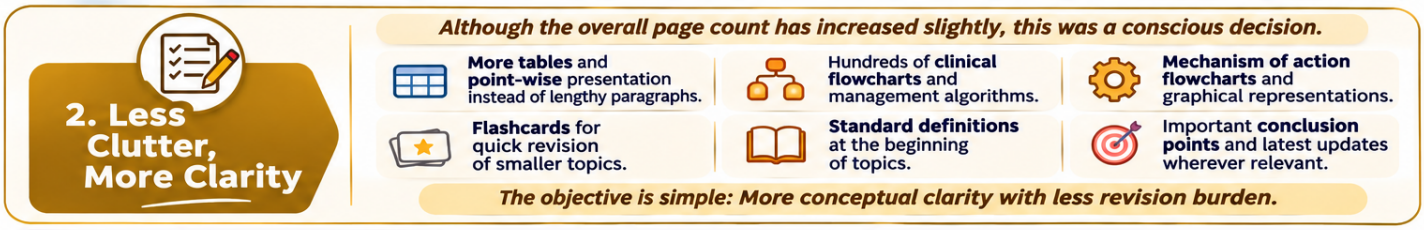
**Hello everyone!**
**Dr. Naveen here from UPSC MEDICO.**

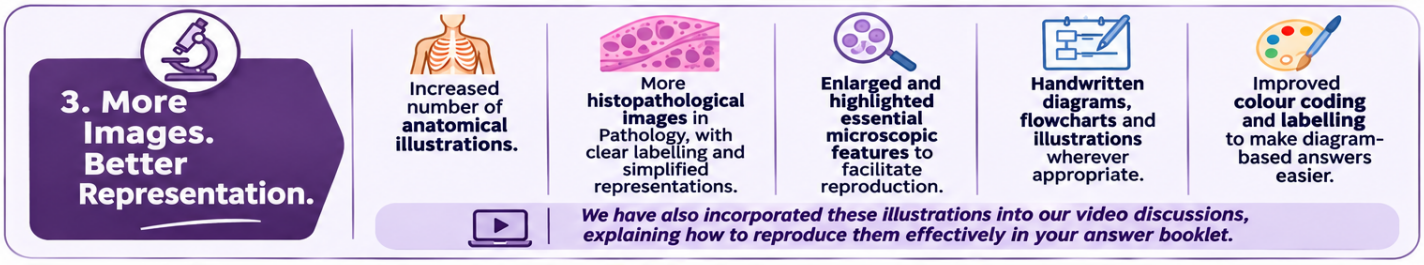
**As promised, we are moving ahead with Edition 3.0 — a significantly upgraded and refined version of Edition 2.0.**

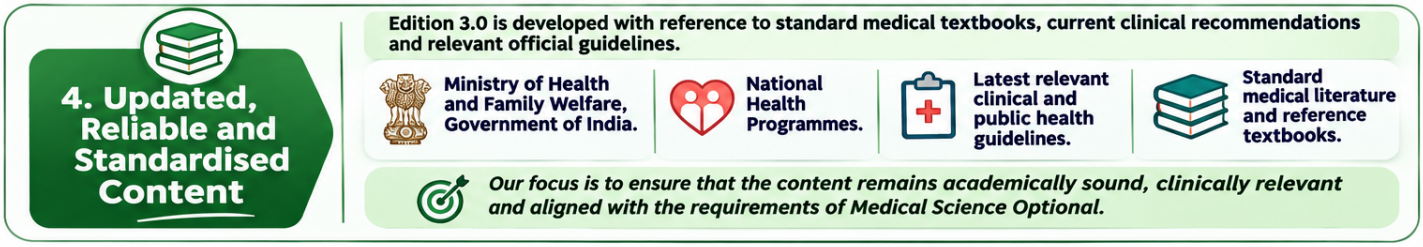
**Our objective was not simply to add more content, but to make the notes more comprehensive, visually engaging, clinically oriented, examination-focused and, above all, easier to revise and reproduce in the examination.**

**Here is what makes Edition 3.0 different.**



# Subject-wise Upgrades in Edition 3.0

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## Preventive & Social Medicine (PSM)



- Updated **National Health Programmes** and recent developments.
- Latest relevant **guidelines** and public health updates.
- Increased use of **SmartArt, tables** and graphical representations.

## Pathology



- Additional **histopathological illustrations.**
- Simplified, **well-labelled diagrams** with emphasis on reproducibility.
- Better integration of **morphological features** and **clinical correlations.**

## Anatomy & Physiology



- Increased number of **illustrations** in Anatomy.
- More **flowcharts** explaining physiological principles and mechanisms.

## Pharmacology




- Improved **mechanism of action** illustrations and flowcharts.
- Updated **treatment protocols.**
- High-yield **comparison tables.**

## Microbiology



- Standardised approaches to **laboratory diagnosis.**
- Better **flowcharts, algorithms** and systematic presentation of important organisms and investigations.

## Forensic Medicine & Toxicology



- Updated **IPC** provisions with corresponding **Bharatiya Nyaya Sanhita (BNS)** sections.
- Introduction of structured **medico-legal approaches.**
- Standardised **toxicological assessment** and management approaches.

## Paediatrics



- Updated **IMNCI guidelines** and **immunisation** schedules.
- High-yield **comparison tables.**
- Improved **clinical assessment,** history-taking and examination points.
- More than **100 handwritten clinical algorithms** and management approaches.

## Obstetrics & Gynaecology



- Additional **clinical management guidelines.**
- Improved **algorithms** and **systematic approaches** to commonly tested clinical scenarios.

## General Surgery



- Greater emphasis on **principles of surgery.**
- Integration of relevant **recent updates** and **standardised approaches** to commonly asked topics.

## Dermatology



- Additional **histopathological illustrations.**
- Emphasis on **tissue-level changes** in commonly encountered dermatological conditions.

# OUR TEACHING PHILOSOPHY

## Learn with the lectures. Consolidate with the notes. Excel in the examination.

At UPSC MEDICO, we believe that good notes should do much more than simply provide information. They should complement effective teaching, strengthen conceptual understanding, facilitate retention and ultimately help you reproduce knowledge confidently in the examination.

**This is the philosophy behind Edition 3.0.**

One important aspect of our approach is that our notes are designed to work in sync with our video lectures. They are not intended to be an independent substitute for classroom teaching or standard medical textbooks.

Why?

Because our notes are essentially a carefully refined, crisp and examination-oriented representation of the concepts we teach. During our lectures, we go beyond the written content, explaining underlying concepts, clinical correlations, important value additions, diagrams, flowcharts and examination-oriented approaches.

Every illustration, handwritten flowchart and clinical algorithm included in the notes is explained during the teaching sessions, helping you understand the underlying concept, remember the representation and reproduce it effectively in the examination.
**We want you to learn through the lectures and consolidate that learning through the notes — not spend additional time preparing another set of notes.**

### What makes this approach effective?

- **Integrated Learning:** The video lectures and digital notes are closely aligned, ensuring that the important concepts discussed during teaching are reflected in your study material.
- **No Need for Separate Note-Making:** We have made a conscious effort to incorporate the key teaching points, important explanations and examination-oriented value additions into the notes themselves.
- **Conceptual Enrichment:** Supplementary handout PDFs further enrich the learning experience, address areas requiring additional conceptual clarity and provide a more comprehensive understanding of the subject.
- **Visual Learning and Retention:** Handwritten diagrams, flowcharts, clinical algorithms and graphical representations are explained during teaching, making them easier to understand, remember and reproduce.
- **Efficient Revision:** Once you have completed the lectures alongside the corresponding notes, you have a consolidated, structured and examination-oriented resource for subsequent revisions.

## An Important Note to Aspirants

At UPSC MEDICO, we have always believed in teaching-led preparation rather than simply providing study material.

Our notes are deliberately designed as an integral component of our teaching programme. Studying them independently may leave certain conceptual explanations, clinical correlations and value additions unexplored, which are otherwise covered comprehensively during our lectures.

Therefore, we strongly recommend following the intended learning sequence: **Video Lectures + Digital Notes + Supplementary Handouts.**

We have invested considerable time and effort in refining Edition 3.0, not merely to give you more pages to read, but to create a more effective learning experience.

We hope these sample pages give you a glimpse of the academic effort behind Edition 3.0 and encourage you to experience the complete teaching programme.

**Learn systematically. Revise intelligently. Write confidently.**

Warm regards,

**Dr. Naveen Kumar**
Founder & Academic Director
**UPSC MEDICO**

### 1. Lectures are the foundation.

Conceptual teaching, clinical correlations, value additions and examination-oriented explanations.

### 2. Notes are the companion.

Crisp, concise and aligned with the lectures, eliminating the need to prepare another set of notes.

### 3. Handouts enrich the learning.

Supplementary material for additional conceptual clarity and comprehensive preparation.

**SAMPLE COVER PAGE**

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# BIOCHEMISTRY

## MEDICAL SCIENCE OPTIONAL

**Each subject has a separate notes handout PDF**

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# SYLLABUS

1. Organ function tests-liver, kidney, thyroid
2. Protein synthesis
3. Vitamins and minerals
4. Restriction fragment length polymorphism (RFLP)
5. Polymerase chain reaction (PCR)
6. Radio-immunoassays (RIA)

## SYLLABUS AND INDEX (page no details) WILL BE MENTIONED for each subject.

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# INDEX


| Topic | Page no. |
|---|---|
| Liver function tests | 12 |
| Renal function tests | 19 |
| Thyroid function tests | 25 |
| Protein synthesis | 32 |
| Vitamins | 47 |
| Minerals | 82 |
| RFLPs | 103 |
| PCR | 111 |
| RIA | 118 |


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# LIVER FUNCTION TESTS

**PYQs**

- Explain the importance of enzyme assay to assess liver function. (2010, 2013)
- Define Jaundice. Write briefly about, formation and fate of bilirubin. Give the major differences between the three types of Jaundice. (2011)
- What are the tests based on the intermediary metabolic functions of liver? Explain the basis of each of these tests. (2011)
- What is obstructive jaundice? Enumerate the various biochemical tests which you would prescribe to the patient. Write the biochemical basis of changes you expect. (2014)
- 30 years old male has come with Jaundice of one-week duration. Discuss the differential diagnosis and management (2005).
- Tabulate the findings of various biochemical tests in blood and urine of patients of pre-hepatic, hepatic and post-hepatic jaundice. (2017)
- A 35-year-old man presented with complaints of generalised weakness, loss of appetite and yellowish discolouration of eyes. The liver function test was done and the report is as follows: (2019)
    - Total bilirubin:10 mg/dL (0.1 –1.2 mg/dL)
    - Direct bilirubin:9 mg/dL (<0.3 mg/dL)
    - Alanine transaminase (ALT): 31 IU/L (<35 IU/L)
    - Aspartate transaminase (AST): 33 IU/L (<40 IU/L)
    - Alkaline phosphatase (ALP) : 800 IU/L (45-150 IU/L)

    1. What is the most likely diagnosis and why?
    2. What will be the expected findings in urine and stool?
- A 15 year old boy from city slum presented with complaints of low-grade fever, vomiting, and yellowish discolouration of the eyes. The liver function test was done and the report is as follows:
    - Total Bilirubin = 7.5 mg/dl (0.1 - 1.2 mg/dl)
    - Direct Bilirubin = 3 mg/dl (0.1 - 0.3 mg/dl)
    - Indirect Bilirubin = 4.5 mg/dl (0.1 - 1.0 mg/dl)
    - Alanine Transaminase (ALT) = 500 (< 35 IU/L)
    - Aspartate Transaminase (AST) = 300 (< 40 IU/L)
    - Alkaline Phosphatase (ALP) = 250 (40 - 130 IU/L)

    1. Write the most likely diagnosis and justify it with the findings.
    2. Classify jaundice on the basis of etiopathology and write their main biochemical findings. (2020)
- A 14-year-old girl presented with low-grade fever, loss of appetite, and yellow discontinuation of the conjunctiva. The attending physician suggested evaluation of liver functions of the patient.
    1. Define and classify jaundice?
    2. Describe the laboratory tests for jaundice and their clinical interpretation? (2021)
- Discuss the serum biochemical markers of cholestasis (2023)
- Classify jaundice according to its etiology. Make a tabular representation of the blood, urinary and stool findings observed in different types of jaundice? (2025)
- 55-year-old male presented in surgery OPD with yellow-coloured sclera and greasy stools. On detailed examination, he was diagnosed with carcinoma of head of pancreas. Based on these clinical findings, discuss the following :
  (i) Serum markers of cholestasis
  (i) Biochemical findings in serum, urine and stool sample in this patient
  (iii) Cause of greasy stools (2026)

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**Each topic will have details of PYQs attached in parallel for quick orientation**

**Functions of liver**

- Intermediary metabolism
    a. Protein metabolism
        I. Deamination of aminoacids
        II. Formation of Urea (Krebs-Henseleit cycle), in turn removing toxic ammonia
        III. Formation of plasma proteins
    b. Carbohydrate metabolism
        I. Regulation of glycogen metabolism
    c. Lipid metabolism
        I. Hepatocellular uptake and metabolism of lipoproteins
        II. Lipogenesis
- Coagulation factor synthesis
- Erythropoiesis-Embryo
- Metabolism of bilirubin
- Endocrine functions (Angiotensinogen/Thromobopoeitin/IGF-1)
- Immune functions-Kupffer cells
- Drug metabolism and excretion
- Storage functions-Vitamin A, D, B12, Glycogen, trace element Iron

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| Hepatic function | Markers for impaired function |
|---|---|
| Heme catabolism | Raised serum bilirubin |
| Enzymes | Raised Alanine transaminase<br>Raised Aspartate transaminase<br>Raised Gamma-Glutamyl transpeptidase |
| Protein synthesis | Decreased serum albumin<br>Increased prothrombin time |
| Protein catabolism | Increased Urea<br>Increased Ammonia |
| Lipid catabolism | Increased cholesterol<br>Increased Triglycerides |
| Drug metabolism | Increased half lives of drugs |
| Bile acid metabolism | Increased bile acids |

# TABLES AND POINT WISE APPROACH ARE KEY TO BETTER PRESENTATION



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# Algorithm for Patient with Jaundice

## History + Physical Examination

## Initial Laboratory Tests

Serum Bilirubin (Total & Direct/Indirect)
ALT / AST / ALP / GGT / PT-INR / Albumin

### Isolated elevation of Bilirubin

#### Direct ↑ (> 15%)

- Dubin-Johnson syndrome
- Rotor syndrome

#### Indirect ↑

- Drugs
- Gilbert syndrome
- Crigler-Najjar syndrome
- Hemolytic disorders

### ↑ Bilirubin + other abnormal tests

#### Hepatocellular pattern

ALT/AST ↑↑↑
ALP – normal or mildly ↑

#### Cholestatic pattern

ALP ↑↑↑
GGT ↑
ALT/AST – mild ↑

## USG Abdomen

#### Ducts Dilated

Extrahepatic cholestasis

- CT/MRCP
- ERCP

#### Ducts Not Dilated

Intrahepatic cholestasis

- AMA (PBC)
- Hepatitis serology (HAV, HBV, HCV, HEV)
- MRCP (if suspicion)
- Liver biopsy

### Additional Evaluation (as indicated)

- Viral serologies : HAV, HBV, HCV, HEV, CMV, EBV, HSV
- Autoimmune markers : ANA, SMA
- Antimitochondrial antibody (AMA)
- Toxicology screen (drug induced)
- Serum ceruloplasmin (Wilson disease)
- Serum protein electrophoresis
- Alpha-1 antitrypsin levels
- Hepatic imaging : USG / CT/MRI/MRCP
- Liver biopsy (when indicated)

*Learn Today Lead Tomorrow*

**Edition 3 is now equipped with hundreds of clinical flow charts for quick revision and easy representation in the exam.**

## Steps in Thyroid hormone synthesis

Uptake and concentration of Iodine by thyroid gland, stimulated by TSH (NIS)

Iodine is oxidized by thyroperoxidase (TPO) enzyme to active form (ORGANIFICATION)

Active form iodinates tyrosine to form MIT and DIT (mono and di iodotyrosine) (COUPLING aided by TPO)

Coupling of Iodotyrosines

MIT+DIT=T3

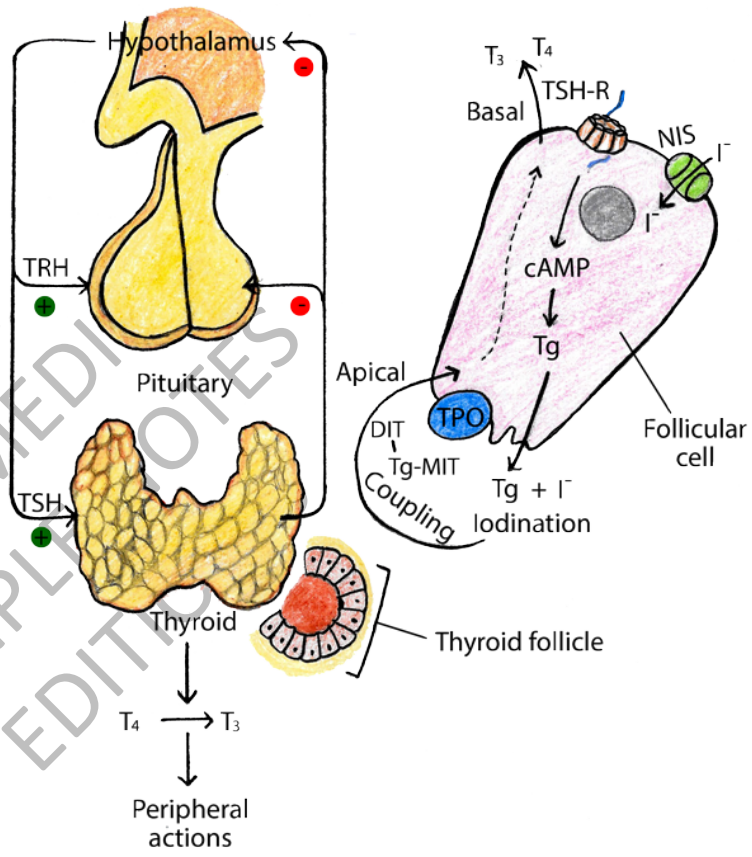
DIT+DIT=T4 (99%)

Stored as Colloid

Upon stimulation by TSH, T4 is released into blood stream

Transported in bound form TBG (thyroxine binding globulin), TBPA (thyroid binding pre-albumin) and albumin

In the peripheral tissues, T4 is converted to T3 by deiodinase




**FLOW CHARTS are key to understanding physiological principles**

# Riedel's thyroiditis : SLOW GROWING GOITRE : STONY HARD | IRREGULAR



- Mimics thyroid cancer in presentation
- Rare condition
- Etiology unknown
- Extensive infiltration of thyroid and surrounding structures with fibrous tissue
  → Associations : Mediastinal | Retroperitoneal fibrosis
- Diagnosis : Biopsy
- Rx needed as it produces compression of surrounding structures

Partial thyroidectomy {
- TRACHEAL / ESOPHAGEAL COMPRESSION
- RLN palsy

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Medicine beyond boundaries...

# Subacute (De Quervain's) Thyroiditis : GRANULOMATOUS THYROIDITIS

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- Transient
- Classical painful form : pain in thyroid region radiating to → (angle of jaw/ears)
  ENLARGED, TENDER
- Infectious with COXSACKIE, MUMPS OR ADENOVIRUSES
  Drugs : Interferon-α, Lithium
- Females : (20-40 yrs)

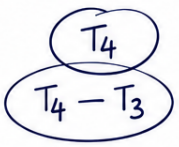
Aggravated by
- Swallowing
- Coughing
- Movement of neck

**Three phases**

Hyperthyroid → Hypothyroid → Euthyroid

0 ⟷ ½ month ⟷ Restoration ⟷ 6 months

- ↑ ESR
- Rx : NSAIDs
  { Prednisolone
  { β-blockers




* ANTITHYROID DRUGS — NO BENEFIT ✗

Levothyroxine : Hypothyroid phase

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FLASH CARDS FOR QUICK REVISION OF MINOR TOPICS

## VITAMIN K

- Only fat soluble vitamin with a specific coenzyme function
- Essential for coagulation
- Vitamin K1-Phylloquinone/plants ; Vitamin K2-Menaquinone/animals and intestinal bacteria ; Vitamin K3-Menadione/synthetic form
- RDA : No RDA-Synthesized in gut. (7—140 mug/day – should be provided from diet)
- Dietary sources : Cabbage, cauliflower, tomatoes, alfa alfa, spinach and other green vegetables, egg yolk, meat, liver, cheese and dairy products.
- **Biochemical functions:**
    - Post translational modifications of Blood clotting factors II (Prothrombin)/VII/IX/X
    - Carboxylation of glutamic acid residues
    - Conversion of glutamate (Glu) to gamma-carboxyglutamate (Gla)
    - Gamma-carboxyglutamate (Gla) residues of clotting factors are negatively charged (COO-) and they combine with positively charged calcium ions (Ca+2) to forma a complex.
    - E.g. **Prothrombin-ca complex** binds to the phospholipids on the membrane surface of the platelets, leads to increased conversion of prothrombin to thrombin.

**VITAMIN K ANTAGONISTS**

**DICUMAROL/WARFARIN**

Dicumarol is structurally related to vitamin K.

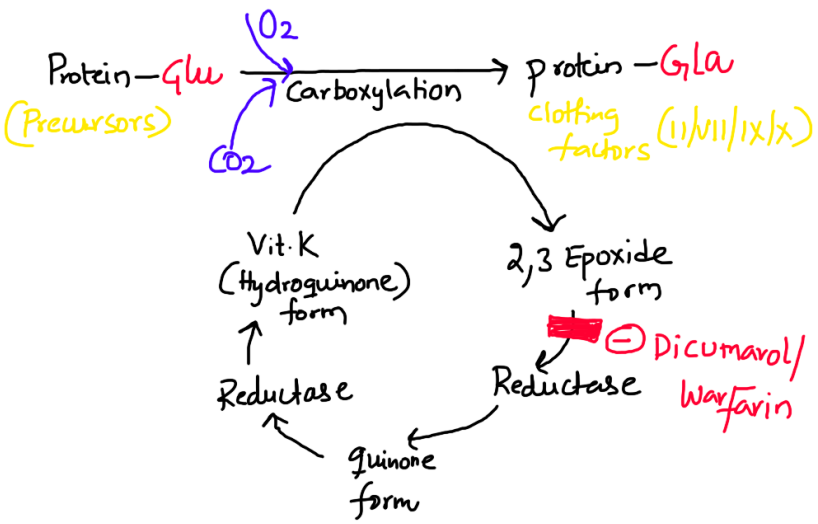
It is an anticoagulant found in spoilt sweet clover.

It acts as a competitive inhibitor in the synthesis of ACTIVE PROTHROMBIN

It inhibits formation of Gamma-carboxyglutamate (Gla)

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Summary of vit.K Cycle in CARBOXYLATION REACTION



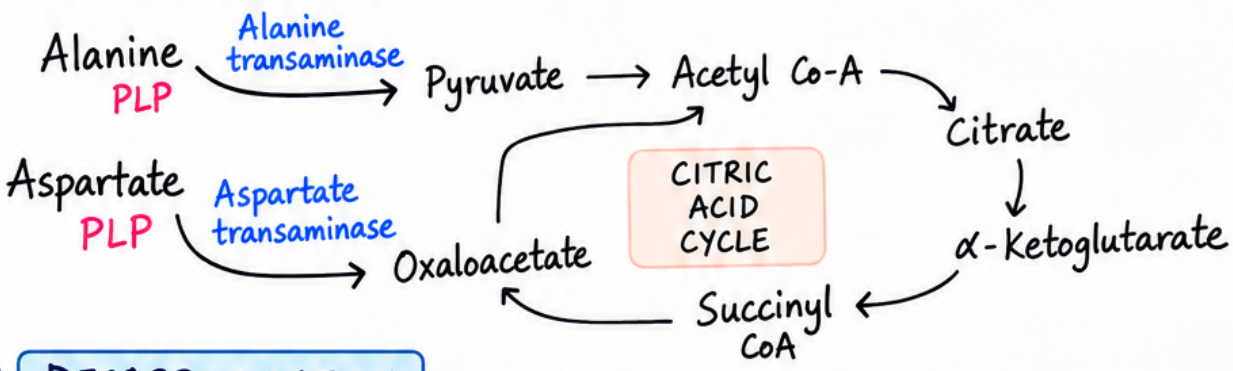
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**HANDWRITTEN CONTENT wherever appropriate**

# Biochemical Reactions of Pyridoxine ($B_6$)

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## 1 TRANSAMINATION




## 2 DECARBOXYLATION

i. Tryptophan $\xrightarrow[\downarrow CO_2]{PLP}$ 5-Hydroxytryptamine (Serotonin)

ii. Histidine $\xrightarrow[\downarrow CO_2]{PLP}$ Histamine

iii. Glutamate $\xrightarrow[\downarrow CO_2]{PLP}$ GABA

iv. Tyrosine → DOPA $\xrightarrow[\downarrow CO_2]{PLP}$ Dopamine → NE → Epinephrine

## 3 Role in Heme Synthesis

Glycine + Succinyl Co-A $\xrightarrow[\text{ALA Synthase}]{PLP}$ ALA → Heme

## 4 Role in Tryptophan Metabolism

Tryptophan → 3-hydroxykynurenine $\xrightarrow[\text{Kynureninase}]{PLP}$ 3-hydroxy Anthranilic acid → $NAD^+/NADP^+$

## 5 Transsulfuration

Homocysteine $\xrightarrow[\text{Cystathionine Synthase}]{PLP}$ Serine → Cysteine

## 6 Deamination

Serine $\xrightarrow[\text{Dehydratase}]{PLP}$ Pyruvate + $NH_3$

Threonine $\xrightarrow[\text{Dehydratase}]{PLP}$ α-Ketobutyrate + $NH_3$



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EACH TOPIC WITHIN SUBJECT HAS A COVER PAGE FOR QUICK REACH

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# PEDIATRICS

## MEDICAL SCIENCE OPTIONAL

## DIARRHOEA OF UNDER FIVE AND THEIR MANAGEMENT

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## ACUTE DIARRHEA

- Discuss the management of a 2-year-old child presenting with diarrhea for 10 days. The child weighs 5 kg, looks moribund, and has low volume peripheral pulses. (2010)
- A 25-day old baby presented with fever, loose stools, vomiting and refusal to accept feeds. C.R.P. was positive. Discuss the diagnosis and management. (2011)
- An 8-month-old child, weighing 8 kg, is brought with loose motions 6 per day, mixed with blood, for last 2 days. There is no history of vomiting. Enumerate the 4 most important signs you will look/feel for to assess the severity of dehydration. Assessment of dehydration reveals some dehydration. Write the initial Prescription for appropriate management of this child. (2013)
- A 13-month-old boy was brought by his mother with six episodes of loose stools and persistent vomiting to the emergency ward. He was found to be lethargic and his pulse rate was 160 per minute. What were the danger signs you would ask for and look for in this child to assess the severity of his illness? If you find severe dehydration, how will you treat the child? If the child is fit to be discharged, yet has 2-3 episodes of loose stools, what advice would you give to the mother? (2018)
- A 2-year-old boy is brought with complaints of loose stools for 7 days, lethargy and inability to feed. The anthropometry of the child is as follows:
    - Weight 4.2 kg (expected 12.2kg)
    - Length 66 cm (expected weight for length 7.5 kg);
    - Mid-upper arm circumference 10.0 cm
    - On examination, the child is having severe pallor and peripheral pulses were poorly palpable.

    i) Identify four major problems (diagnoses) in this child and provide points in favour for each diagnosis.

    ii) Outline the management of this child in the first two hours after immediate hospitalisation. (2019)
- An 18-months old child weighing 7 kg has presented with a history of diarrhoea, vomiting, rapid breathing and dehydration. How will you manage the child as per IMNCI protocol? (2020)
- A 15-month old child brought by the mother with a history of 6 episodes of vomiting and 4 episodes of watery diarrhea was found to have lethargy and is unable to drink. The child weighed 10 kg before this event of illness.

    (i) How would you assess the severity of the illness in this child?

    (ii) Write the fluid management in the first 3 hours?

    (iii) Write the treatment guidelines after 3 hours if the child still exhibits signs of dehydration?

    (iv) Write the composition and preparation of the WHO Oral Rehydration Salts (ORS) (2021)
- Define acute diarrhea in children. List its causes. How would you assess for dehydration in such a child. Write the nutritional management of acute diarrhea and the steps to be taken for prevention of acute diarrhea. (2025)

## CHRONIC/PERSISTENT DIARHHEA

- A 9-month old baby is brought with complaints of 3 episodes of diarrhea since his mother stopped breastfeeding at the age of 6 months and started cow's milk along with other food. The current episode of diarrhea began 18 days ago. The baby still takes cow's milk but his mother has reduced his intake of solid food since the diarrhea began. There is no blood in the stool. He weighs 6 kg (2009).
    iii. How will you classify his illness?
    ii. What will you look for during the examination of this baby?
    iii. How will you manage this baby?
- A 4-year-old male child is admitted with a history of diarrhea, pain abdomen, and vomiting since the age of one year. He had taken treatment from various practitioners without significant improvement. On examination, the child is malnourished, weight 9 kg, height 90 cm. There are signs of vitamin and mineral deficiency.
    (i). Enumerate all the probable causes of this condition.
    (ii). What investigations will you advise to diagnose the cause?
    (iii). Describe the management of celiac disease. (2012)
- Define "persistent diarrhea" in under-five children. How is it different from "chronic diarrhoea"? Discuss the dietary management of persistent diarrhoea. Enumerate few common causes of chronic diarrhoea. (2016)
- A 4-year-old child presents with stunted growth and moderate pallor. The child had a history of intermittent diarrhea. (2017)
    (i). Mention the differential diagnosis.
    (ii). Mention the investigations required for the diagnosis of celiac diseases.
    (iii). Outline the management of celiac diseases in children.
- A 3-year-old child presents with a history of loose stools for last 20 days, which started as an acute infective diarrhea episode. On examination, the child appeared sick looking, irritable, undernourished and having some dehydration. There was marked perianal excoriation. A systematic examination is within normal limits.
    **(i)** What is your complete diagnosis? Justify the same.
    **(ii)** Discuss the probable etiopathogenesis leading to the present diagnosis.
    **(iii)** Outline the principles of stepwise management of this child in brief. (2019)

**IMNCI-Diarrhea**

**NEXT STEP AS PER IMNCI GUIDELINES IS**

**ASK/LOOK AND FEEL:**

1) For how long?
2) Is there blood in stool?
3) Is the child-Lethargic or unconscious? Restless and irritable?
4) Look for sunken eyes
5) Offer the child the fluid. Find out A) is the child not able to drink or drinking poorly? B) Drinking eagerly or thirsty?
6) Pinch the skin of the abdomen. Does it go back very slowly or slowly?

**NOW CLASSIFY DIARRHEA**
**For Dehydration**

| | |
|---|---|
| **SEVERE DEHYDRATION**<br><br>**TWO OF THE FOLLOWING SIGNS**<br>• Lethargic or unconscious<br>• Sunken eyes<br>• Not able to drink or drinking poorly<br>• Skin pinch goes back very slowly<br>• | • If the child has no other severe classification-Give fluids for severe dehydration-PLAN C<br>• If the child also has another severe classification: Refer urgently to hospital. (Advice mother to continue breastfeeding, give frequent sips of ORS on the way.)<br>• If there is cholera in your area, if the child is 2 years+ give DOXYCYCLINE |
| **SOME DEHYDRATION**<br><br>**TWO OF THE FOLLOWING SIGNS**<br>• Restless, irritable<br>• Sunken eyes<br>• Drink eagerly, thirsty<br>• Skin pinch goes back slowly | • Give fluids for some dehydration -Plan B<br>• Advice mother when to return immediately<br>• Follow up in 5 days if not improving |
| **NO DEHYDRATION**<br><br>Not enough signs to classify as some or severe dehydration<br>**If diarrhea is present for 14 days or More** | • Give fluids for some dehydration -Plan A<br>•<br>• Advice mother when to return immediately<br>• Follow up in 5 days if not improving |

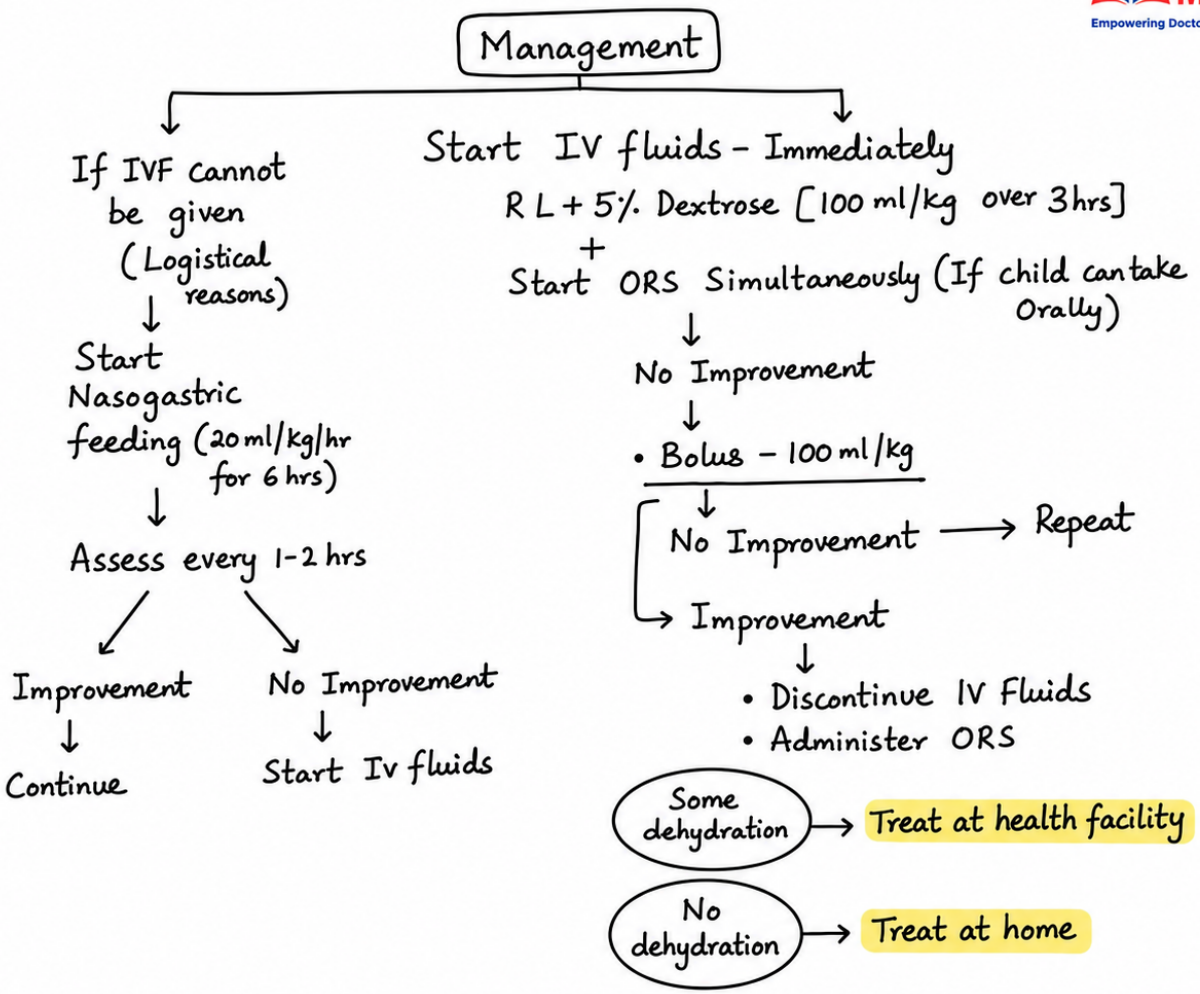
| | | |
|---|---|---|
| **Dehydration present** | Severe persistent diarrhea | Treat dehydration before referral unless the child has another severe classification<br>Refer to hospital |
| **No Dehydration** | Persistent diarrhea | Advise mother on feeding a child who has persistent diarrhea<br>Give single dose of vitamin A<br>Give zinc supplements daily for 14 days<br>Follow up in 5 days |

**And if Blood in stool**

| | | |
|---|---|---|
| **Blood in stool** | Dysentery | Treat for 5 days with cefixime<br>Treat dehydration<br>Give zinc supplements for 14 days<br>Follow up in 2 days |

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# Diarrhea - Severe dehydration



## Immunization

# UPTO DATE INFORMATION

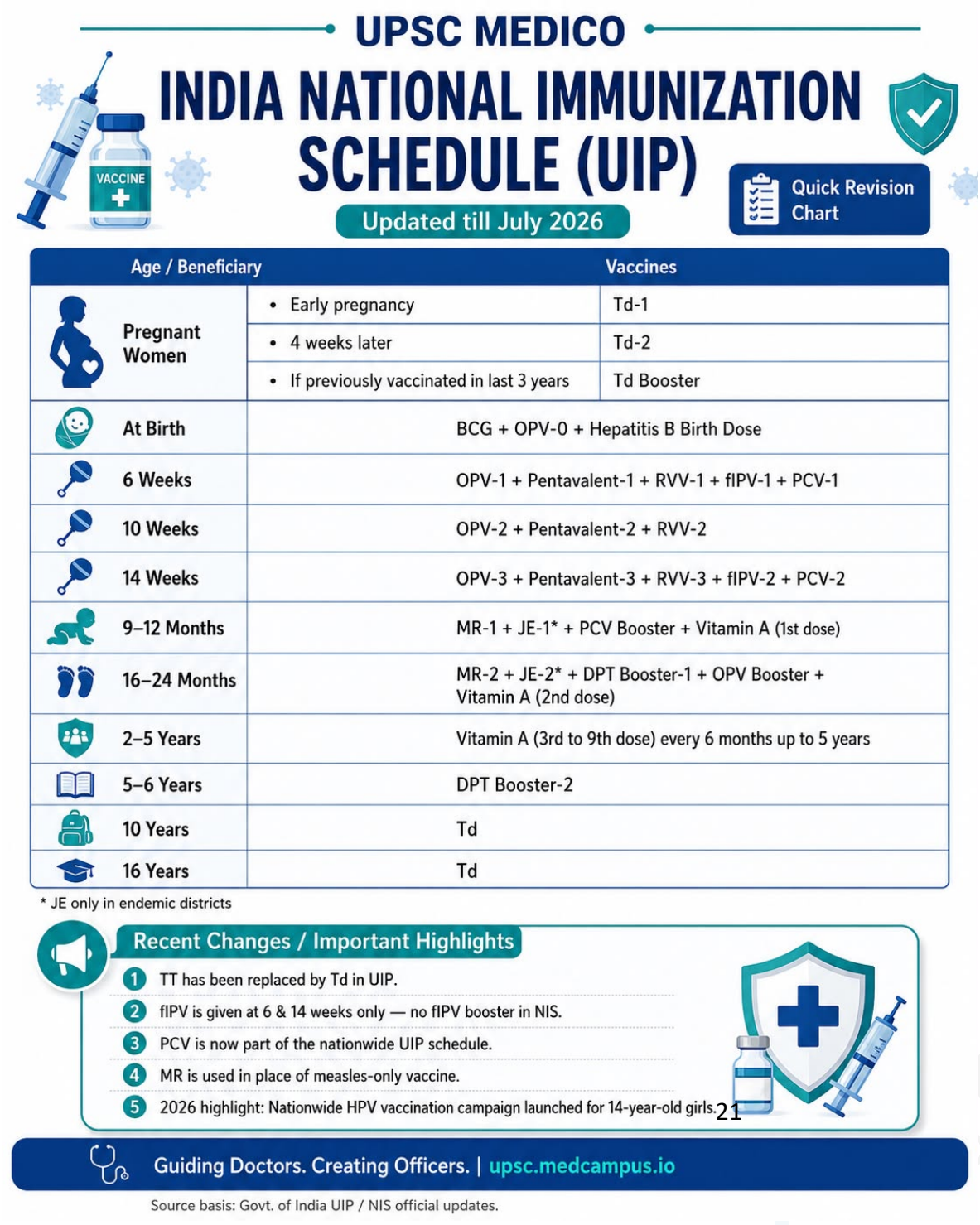
Immunization is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine.

Vaccines stimulate the body's own immune system to protect the person against subsequent infection or disease.

A vaccine is composed of one or more antigens of a pathogenic agent which, when administered to a previously unexposed individual, will elicit an immune response but not cause disease.

**Strengthening of immunization coverage is an important component of the NRHM.**

The following schedule has been recommended by the Ministry of Health, Govt. of India



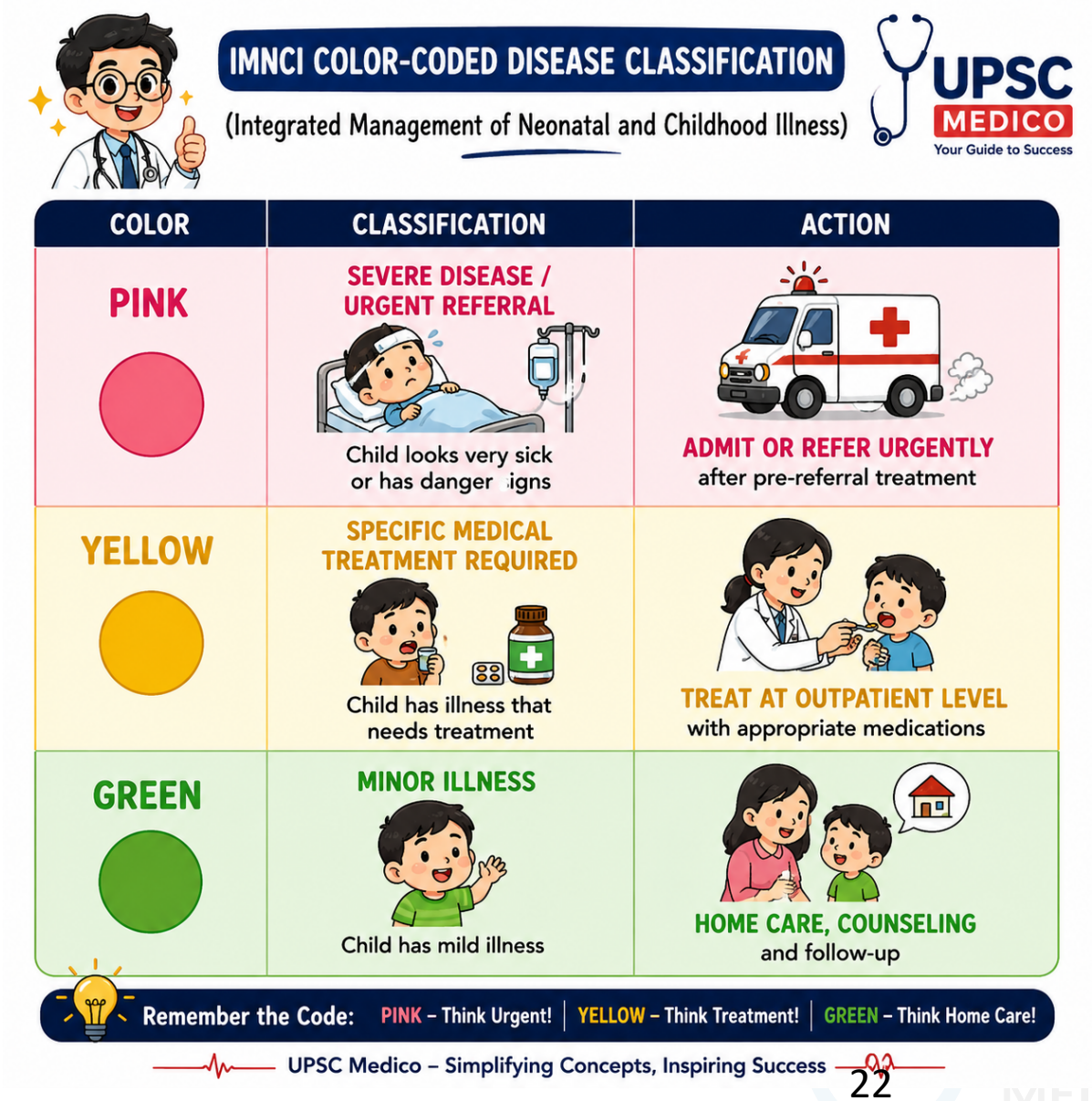
**Effective communication and counselling steps as per IMNCI guidelines**

Counseling a mother/caretaker is critical for home care.
The health professional should use good communication skills while counseling the mother I caretaker for Treatment.

Effective communication and counselling:

**APAC**

• **Ask and listen**: Ask the mother/caretaker and listen carefully to find out the young child's problems and what the mother/caretaker is already doing for the young infant
• Praise: Praise the mother/caretaker for what she has done well
• Advise and teach: Advise the mother/caretaker how to take care of young child at home (for tasks which require mother/ caretaker to carry out treatment at home: give information, show an example, and let her practice)
• Check: Before the mother/caretaker leaves, always check understanding by asking questions to find out what she understands and what needs further explanation.



# Kwashiorkor vs Marasmus

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HIGH YIELD TABLES FOR EFFECTIVE COMPARISON

| Feature | Kwashiorkor | Marasmus |
|---|---|---|
| Cause | Severe acute malnutrition with predominant **protein deficiency** (usually with overall ↓ calorie intake) | Severe acute malnutrition due to deficiency of **both protein & energy** (calorie deficiency) |
| Onset | Relatively **rapid** (weeks–months) | **Gradual** (months) |
| Age group | Classically **1–3 years** (can occur at any age) | Often **<2 years** (can occur at any age) |
| Appearance | **Oedema** (pitting), moon face | Severe wasting (loss of subcutaneous fat & muscle) |
| Weight | May be near normal (or only mildly ↓) (due to oedema) | Severely reduced (very low weight-for-age) |
| Hair | **Flag sign** (alternating bands of normal & discoloured hair), sparse, brittle | Thin, scanty, dry |
| Skin | **Flaky paint dermatosis** (peeling, patchy, hyper-/hypopigmented) | Dry, thin, wrinkled skin with **"baggy pants"** appearance |
| Appetite | **Poor** (anorexia) | Relatively good (often preserved) |
| Fatty liver | **Present** (hepatic steatosis) | Absent |
| Mental status | Apathy, lethargy, irritability | Usually alert (may also be irritable) |

## Flag Sign (Hair)



Alternating bands of normal & discoloured hair

## Flaky Paint Dermatosis



Peeling, patchy hyper-/ hypopigmented skin ("flaky paint")

## Baggy Pants Appearance



Loose, wrinkled skin due to severe loss of subcutaneous fat

## Key Corrections / Exam Pointers

- ✔ Both are forms of **severe acute malnutrition**; not only isolated protein deficiency.
- ✔ Age ranges **overlap**; Kwashiorkor is classically ~1–3 years; Marasmus often <2 years.
- ✔ Weight in Kwashiorkor may be **near normal due to oedema** (not always).

**ASSESSMENT**

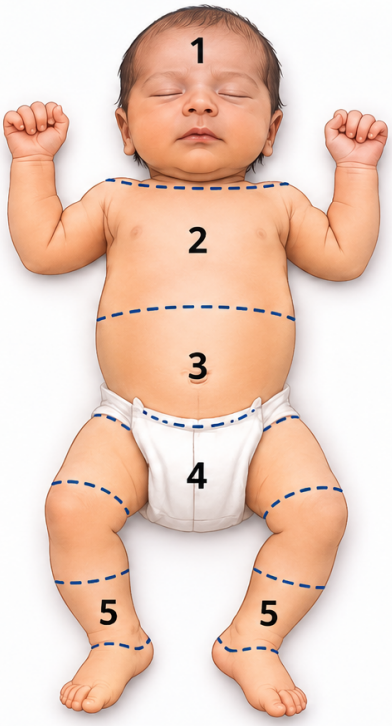
**History**

- Birth history- Term/Preterm gestation, Cesarean/Assisted labour by Forceps or Vacccum device /Normal delivery (CEPHALOHEMATOMA)
- **Family History**-Genetic disorders (Thalassemia, Hereditary spherocytosis)
    - Previous sibling with jaundice in the neonatal period, particularly if the jaundice required treatment
    - Other family members with jaundice or known family history of Gilbert syndrome
    - Anemia, splenectomy, or bile stones in family members or known heredity for hemolytic disorders
    - Liver disease in family members
- H/O Breast feeding (Breast feeding jaundice/Breast milk jaundice)
- Assessment of stool color-Staining of nappies (Obstructive jaundice)
- Symptoms or signs of hypothyroidism in Mother

**EXAMINATION:**

## Kramer Dermal Zones

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| Zone | Area Involved | Approx. TSB (mg/dL) |
|---|---|---|
| 1 | Head and neck | ≈ 5 |
| 2 | Upper trunk (up to umbilicus) | ≈ 8–10 |
| 3 | Lower trunk (below umbilicus up to thighs) | ≈ 10–12 |
| 4 | Arms and legs (up to knees and elbows) | ≈ 12–15 |
| 5 | Palms and soles | > 15 |

**Key Points**

- A bedside, clinical method to estimate the level of jaundice.
- Progression of jaundice follows a cephalocaudal pattern (from head to toe).
- Useful for initial screening; serum bilirubin measurement is required for confirmation and management.

**INVESTIGATIONS**

The aim of performing investigations is to confirm the level of jaundice, identify the cause and follow response to treatment.

**First line**

- Total serum bilirubin
- Blood groups of mother and baby
- Peripheral smear

**Second line**

- Direct Coombs test
- Hematocrit
- Reticulocyte count
- G6PD levels in RBC

CLINICAL ASSESSMENT MADE EASY

# Approach to an infant with Jaundice

**Step 1:** Does the baby have serious jaundice*?

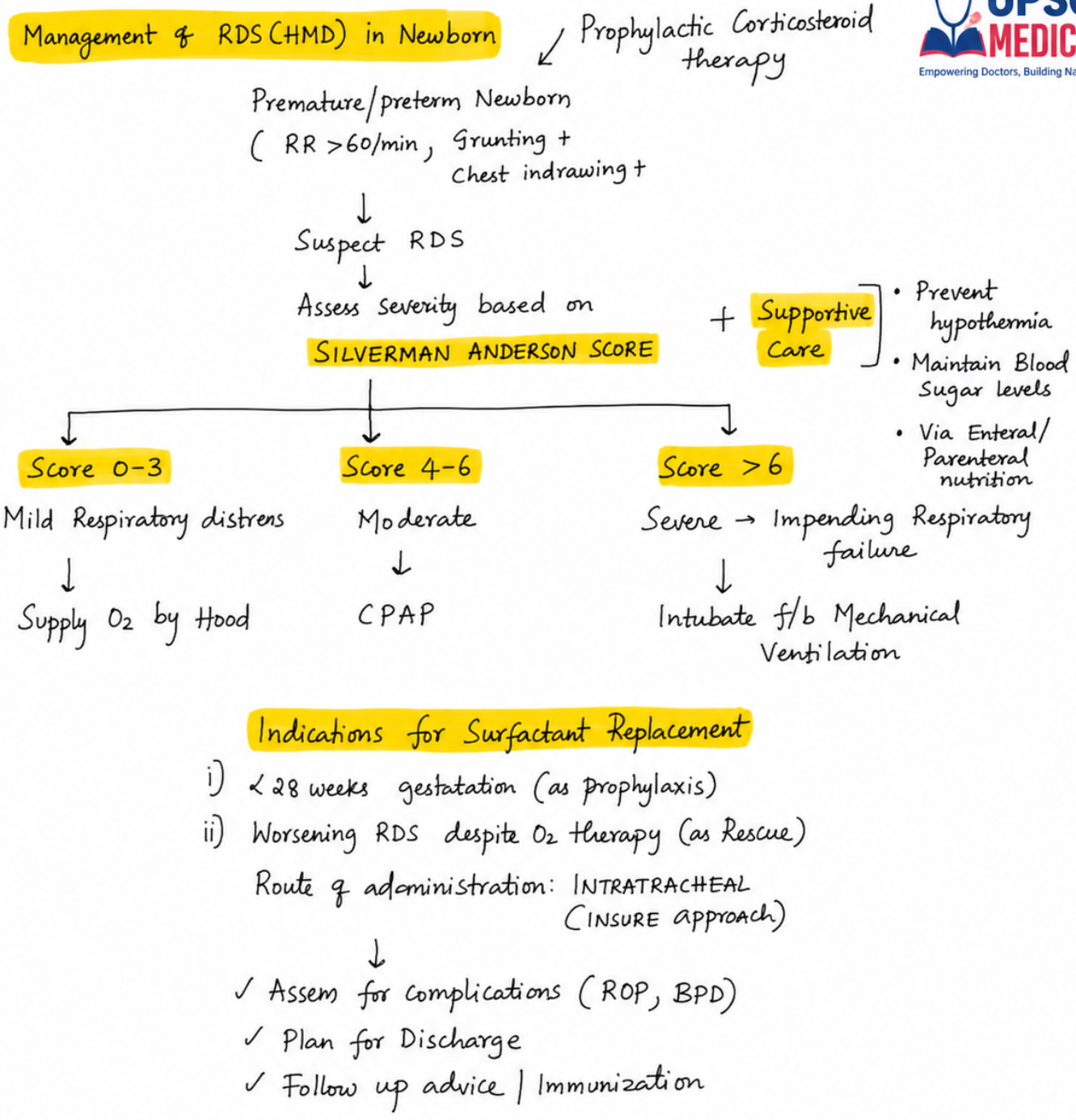
- **Yes** → Start phototherapy → Measure TSB level and determine if baby requires phototherapy or exchange transfusion **Based on Nomograms** → **Step 3:** Determine the cause of jaundice and provide supportive and follow up care
- **No** → **Step 2:** Does the infant have significant jaundice to require TSB measurement?
  - **Yes** → Measure TSB level and determine if baby requires phototherapy or exchange transfusion **Based on Nomograms** → **Step 3:** Determine the cause of jaundice and provide supportive and follow up care
  - **No** → Continued observation every 12 to 24 hr for initial 3 to 5 days

**Serious jaundice:**

a. Presence of visible jaundice in first 24 hour
b. Yellow palmsand soles anytime
c. Signs of acute bilirubin encephalopathy or kernicterus: hypertonia, abnormal posturing such as arching, retrocollis, opisthotonus or convulsion, fever, high pitched cry
d. TcB/TSB value more than 95$^{th}$ centile as per age specific nomogram

***Measure serum bilirubin if:**

a. Jaundice in first 24 hour
b. Beyond 24 hr: if on visual assessment or by transcutaneous bilirubinometry, TSB is likely to be more than 12 to 14 mg/dL or approaching phototherapy range or beyond.
c. If you are unsure about visual assessment




**100 + (Handwritten) Algorithmic approaches for clinical case management**

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# Pharmacotherapy of Hypertensive Emergency

**First line:** IV Nicardipine (CCB) [AHA/ACC]
or
IV Clevidipine

**General Target:** Reduce MAP by about 20-25% during first 1-2 hours

**Avoid abrupt fall in BP**

## Special Scenarios
[Drug of choice]

- **Pregnancy**
  - Labetalol
  - Hydralazine
- **Aortic dissection**
  - Esmolol
- **Pheochromocytoma**
  - Phentolamine
- **Renal dysfunction**
  - Fenoldopam
- **Acute pulmonary edema / ACS**
  - Na Nitroprusside /
  - Nitroglycerin

* Goal is controlled reduction of BP, not rapid normalization.

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% Steatorrhea / weight loss

↓

Order Blood tests

## Hematology

- CBP → Macrocytic ($B_{12}$ def)
  → Microcytic (iron def)
- PT → (↑ in Vit K def)

## Biochemistry

→ Serum $B_{12}$ / Folate / Zinc (↓)
→ Serum Iron Indices (↓)
→ Urea / Creatinine
→ Electrolytes (↓)
→ Albumin (↓)
→ Immunoglobulins
→ Coeliac Antibodies

↓

**Next step: Investigate for Small Intestine**

* Duodenal biopsy
* Barium studies (small bowel MRI)
* Faecal calprotectin
* Lactulose / glucose hydrogen breath test

↓

**IF NORMAL FINDINGS**

**Go to next step:**

**Investigate for pancreas**

↓

* Pancreatic function : Faecal elastase test
* USG / CT
* MRCP

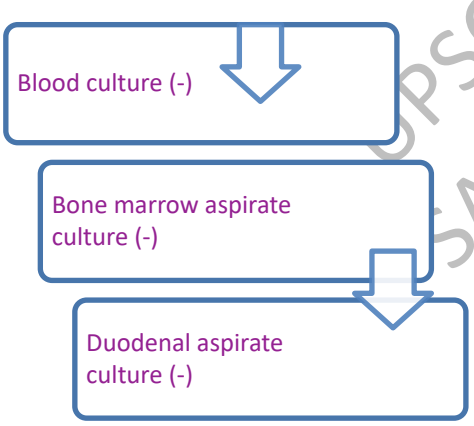
→ IF NORMAL: Go to next step: **Consider bile salt malabsorption** →

* Se HCAT Scan (Se-Homocholic acid taurine)
* Serum 7α-hydroxy Cholestenone

## Lab diagnosis of Salmonella

| Specimen | Transfer media | Direct microscopy | Culture media | Biochemical reactions |
|---|---|---|---|---|
| • Blood culture (1st week)<br>• Urine/Stool cultures (4th week) | • Buffered Glycerol saline/ Cary Blair medium | • Motile gram negative rods with peritrichate flagella | • Blood (monophasic/ Castaneda's biphasic medium) | • I -/MR +/VP -/ Citrate -<br>• Urease negative |

| Histopathology of tissues | Serological diagnosis | Molecular diagnosis | Other tests |
|---|---|---|---|
| | • **Widal test (2nd and 3rd weeks)** | | • Leucocytosis/ Leucocytopenia<br>• Elevated LFT |








Urine/stool (Macconkey agar/DCA/XLD agar/Wilson Blair's Brilliant green Bismuth sulfite medium (jet black colonies with a metallic sheen)

# STANDARD APPROACHES FOR MOST COMMON ASKED PATTERNS/QUESTIONS/TOPICS

PSC MEDICO SAMPLE NOTES

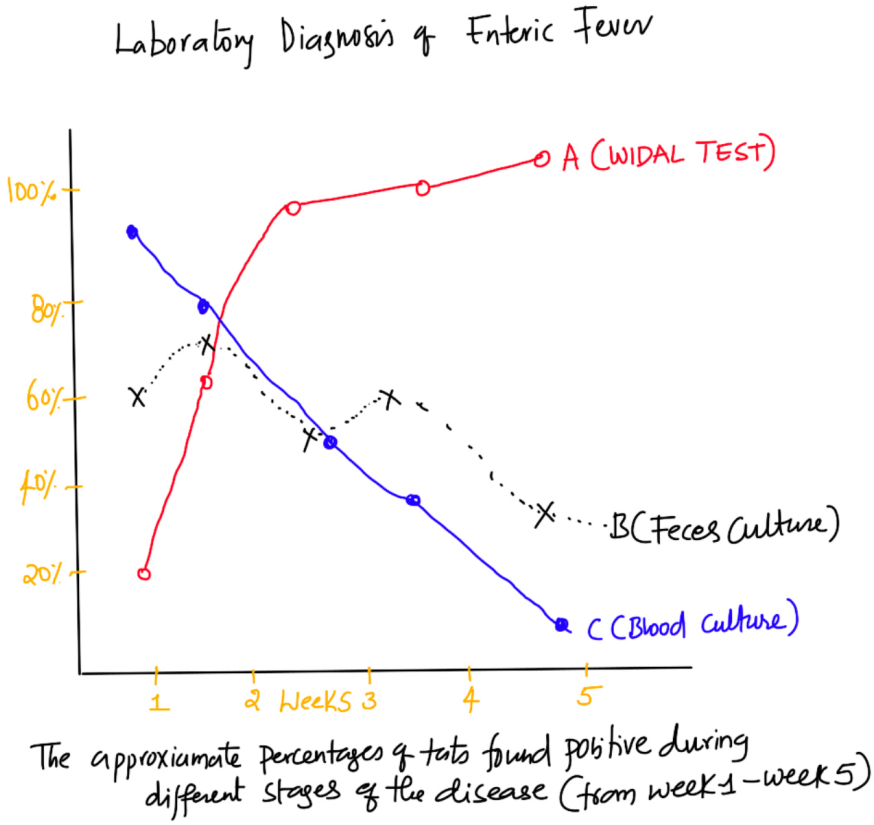
**CLINICAL PRESENTATION :**
Incubation period is 7-14 days (5-21 days)
Infective Dose (ID50) = $10^3$ to $10^6$ bacilli
Most prominent symptom : FEVER

**Clinical features : (TIME OF DISEASE)**
Prolonged fever: 0-4 weeks
RASH SPOTS : End of first week and resolves with after 1-5 days
Gastrointestinal bleeding and intestinal perforation : 3-4 months of illness

**CLINICAL FEATURES**
- Step ladder fever
- Headache
- Chills
- Cough
- Sweating
- Myalgias
- Anorexia, abdominal pain, constipation, diarrhea, vomiting,
- Coated tongue
- Hepatosplenomegaly
- Abdominal tenderness
- ROSE SPOTS
- Epistaxis
- Relative bradycardia

**GRAPHICAL REPRESENTATION if needed**

**DIAGNOSIS**




**BASU**: **B**lood culture in the 1st week. **A**ntibody detection (Widal) in 2nd week. **S**tool culture in the 3rd week. **U**rine culture in the 4th week.

## Serological pattern in an HIV infection according to the time of presentation:

**1) ANTIGEN DETECTION: (P24 antigen assay)**
**Following a massive infection: (Blood transfusion) :**
The major core antigen P24 can be detected in blood after about 2 weeks.
IgM antibodies appear in about 4-6 weeks to be followed by IgG antibodies

**Following a small infective dose: (Needle stick injury):**
The major core antigen P24 can be detected in blood after about 3-6 weeks: Coincides with acute or seroconversion illness
IgM antibody response is delayed too

P24 therefore disappears from circulation and reappears only when terminal phase (Severe clinical disease) sets in (anti-p24 disappears).

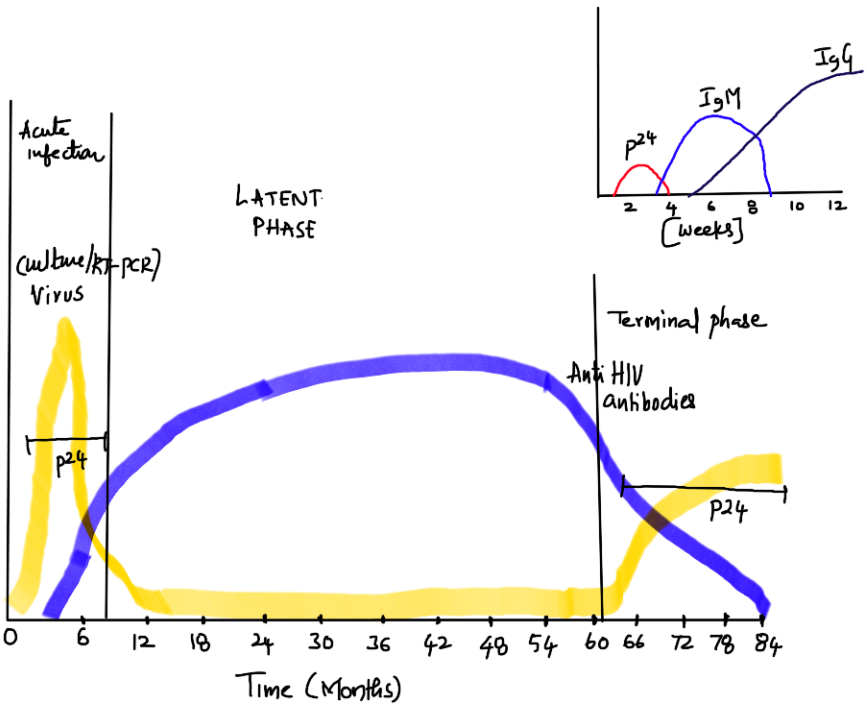
**2) VIRUS ISOLATION:**
Virus titres paralle with P24 titres
Levels are high: Soon after infection and in terminal phase
Low and antibody bound: During Asymptomatic period.

**3) ANTIBODY DETECTION:**
It takes 2-8 months for the antibodies to appear post infection: WINDOW PERIOD
Once antibodies appear they increase in titre and broaden in spectrum for the next several months.
IgM disappears in 8-10 weeks while IgG remains through out.

**SUMMARY**
Acute infection: Seroconversion illness : P24 and HIV Virus + Antibodies –
Asymptomatic of latent infection : P24 and HIV virus – Antibodies + (IgM, IgG anti HIV antibodies and Anti-P24 antibodies)
Terminal phase : P24 and HIV Virus + Antibodies + (IgG anti HIV antibodies)

UPSC MEDICO SAMPLE NOTES SECTION 3

Illustration of Usual time-Course of Immune response, Viremia, and disease resulting from Untreated HIV-Infection



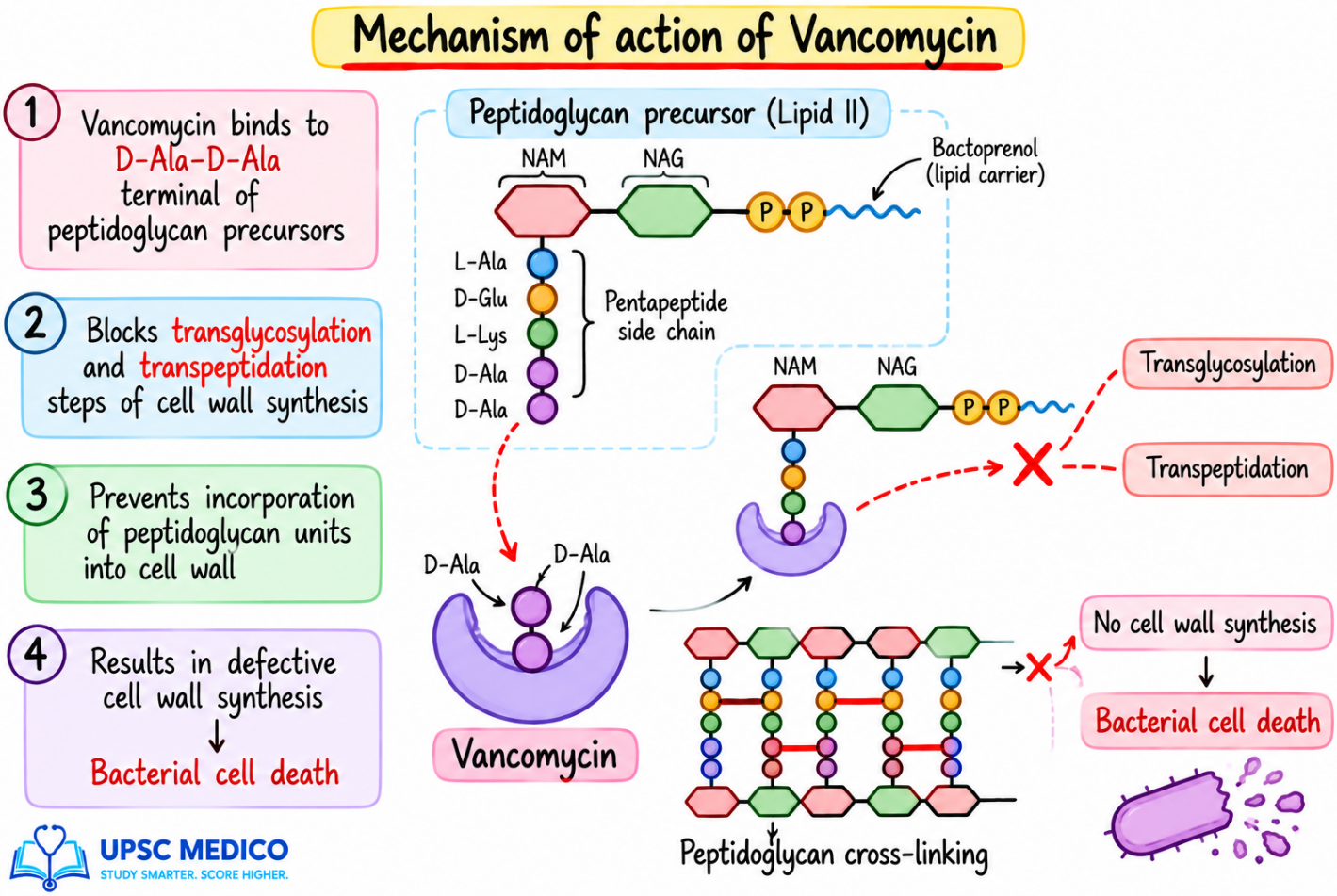

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**Simple images with clear details and proper labelling making it easy to replicate in the exam**

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**Vancomycin**

| Therapeutic indications | Drug interactions | Side effects |
|---|---|---|
| Glycopeptide antibiotic, act by inhibiting bacterial cell wall synthesis<br><br>Most effective drug for serious MRSA infections<br><br>Pseudomembranous enterocolitis<br><br>Used as a prophylaxis during urinary catheterization in patients with cardiac valvular lesions<br><br>Antibiotic regimen in case of contaminated dirty wounds<br><br>Empirical therapy for Bacterial Meningitis | **Nephrotoxicity**-All nephrotoxic drugs like aminoglycosides, amphotericin B and NSAIDs enhance its toxicity. | Vancomycin has the potential to release histamine by direct action on mast cells. Rapid i.v. injection has caused chills, fever, urticaria and intense flushing called **'Red man syndrome'.**<br><br>**Nephrotoxicity**<br>**Hearing loss** |




**Mechanism of Action covered in detail with both images and flowcharts for better understanding**

# Latest NACO Guidelines for Management of HIV/AIDS in INDIA

Preferred first-line regimen

The preferred regimen for eligible adults and adolescents is:

## TLD

**Tenofovir + Lamivudine + Dolutegravir**

| Drug | Dose |
|---|---|
| Tenofovir disoproxil fumarate (TDF) | 300 mg |
| Lamivudine (3TC) | 300 mg |
| Dolutegravir (DTG) | 50 mg |

Once daily

Fixed-dose combination (FDC), generally one tablet daily.

| Clinical situation | Important consideration |
|---|---|
| Renal impairment | TDF may need replacement or dose modification |
| Anaemia | Avoid zidovudine where possible |
| Rifampicin-based ATT | DTG dose adjustment is required |
| Hepatitis B coinfection | Prefer a regimen containing TDF + 3TC |
| Drug resistance or treatment failure | Evaluate for second-line ART |
| DTG intolerance or contraindication | Consider an alternative regimen under ART-centre guidance |

| Situation | NACO recommendation |
|---|---|
| HIV-TB coinfection | Start ATT first |
| After starting ATT | Initiate ART as early as possible, within 2 weeks, irrespective of CD4 count |
| TB meningitis | Delay ART for at least 4 weeks; initiate within 8 weeks of starting TB meningitis treatment |
| Rifampicin with DTG | DTG 50 mg twice daily during rifampicin therapy and for 2 weeks afterwards |

**Treatment protocols : UPTO DATE based on standard references: more inclined to MOHFW (GOVT OF INDIA) guidelines**

# Treatment of PID

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## Principles of treatment

- Control infection [Antimicrobials]
- Prevention of Complications [Infertility]
- Prevention & Reinfection
  - → Education
  - → Treating sexual partners
  - → Barrier contraception
  - → Trace and Rx partner effectively

→ Adequate rest (relative)

→ **Antibiotics** : 14 days

Levofloxacin 500 mg bd
Metronidazole 500 mg bd
} Ceftriaxone (consider in selected cases)

→ **Indications for admission**

- ✓ Suspected Tubo-ovarian abscess
- ✓ Severely ill (toxicity / sepsis)
- ✓ Uncertain diagnosis
- ✓ No responce to OP Rx for 48 hrs
- ✓ Intolerance to oral antibiotics
- ✓ Co-existing pregnancy
- ✓ HIV infection +

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## In patient therapy

→ Strict Bed rest
→ Restrict oral feeding
→ Correct Dehydration / Acidosis
→ IV antibiotic therapy
[2 - 4 days]

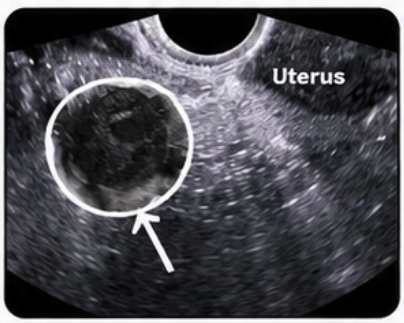
Cefoxitin 2gm IV
+
Doxycycline

↓

## Indications for Sx

→ Generalized peritonitis
→ Pelvic abscess
→ Tubo-ovarian abscess
[Unresponsive to 2 - 3 days of antibiotics (or) Rupture]
[Size > 10 cm)]

## Surgical Drainage




✓ USG guided needle aspiration (Transvaginal)
(or)
✓ Laparoscopic Surgery
(or)
✓ Laparotomy + surgical drainage + Salpingectomy
(or)
✓ Historical - TAH + BSO

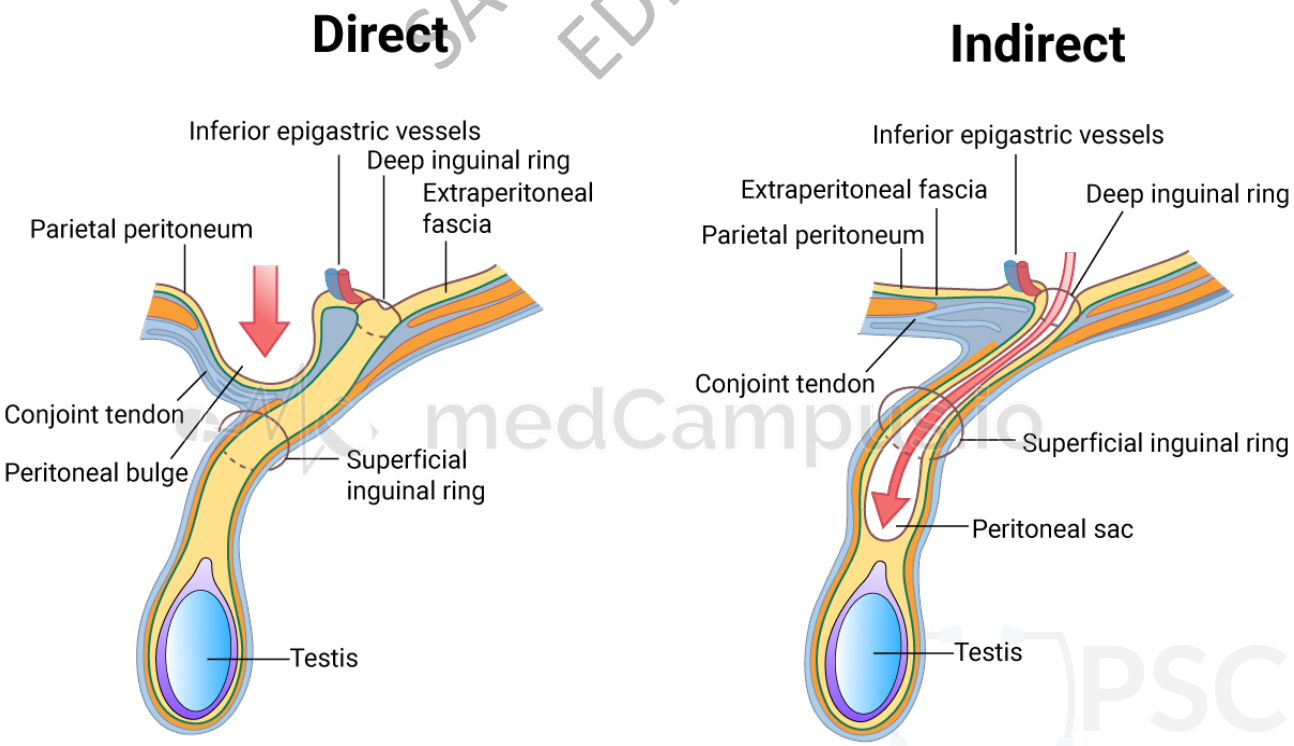
**Inguinal Region - Applied anatomy**

**Inguinal Hernia - Clinical features**

- **Clinical features**
- **Symptoms**
  - Lump on the abdominal wall under skin
  - Mostly painless
  - Some times aching or heavy felling
  - Sever pain suggests high risk of strangulation
- **Signs**
  - Reducible or nonreducible
  - Cough impulse
  - Tenderness
  - Overlying skin changes
  - Signs of previous repair

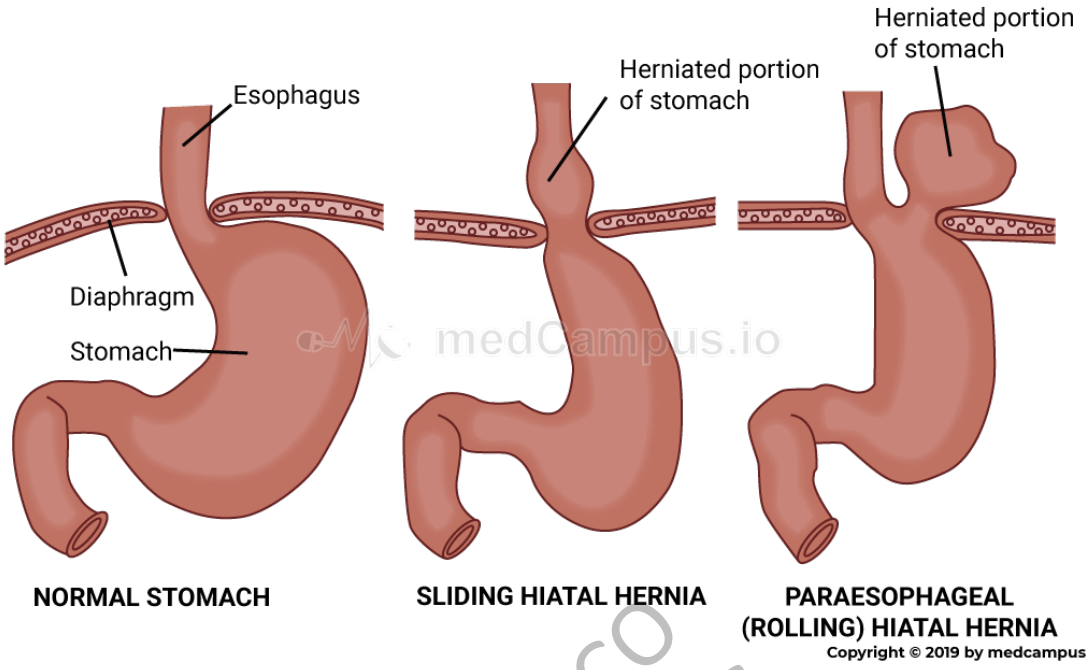
| **Direct hernia** | **Indirect hernia** |
|---|---|
| Medial to inferior epigastric vessels through hesselbach's triangle | Lateral to the inferior epigastric vessels |
| Old age | Children and young adults<br>More common variety (85%) |

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## Hiatal Hernia




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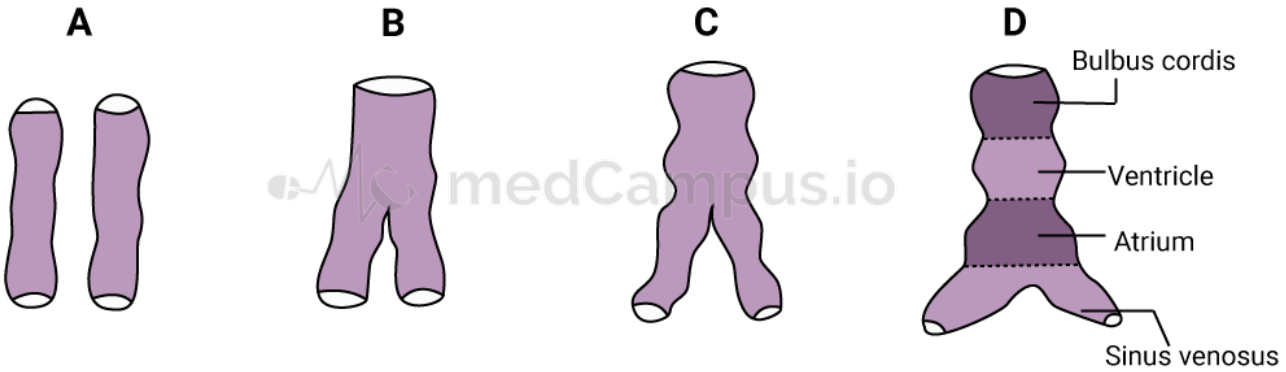
| Congenital hiatal hernia/Paraesophageal/Rolling type (5%) | Acquired hiatal hernia/Sliding type |
|---|---|
| • Persistence of embryonic peritoneal process in the posterior mediastinum, leading rolling up of stomach upside.<br>• Normal relationship between cardioesophageal junction and diaphragm is not disturbed, therefore no complaints of GERD. | • Sliding type of hernia is due to weakness of phrenicesophageal junction, which holds esophagogastric junction tight.<br>• Normal relationship between cardioesophageal junction and diaphragm is disturbed leading to GERD. |

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# ANATOMY NOTES PDF with Images as a high priority

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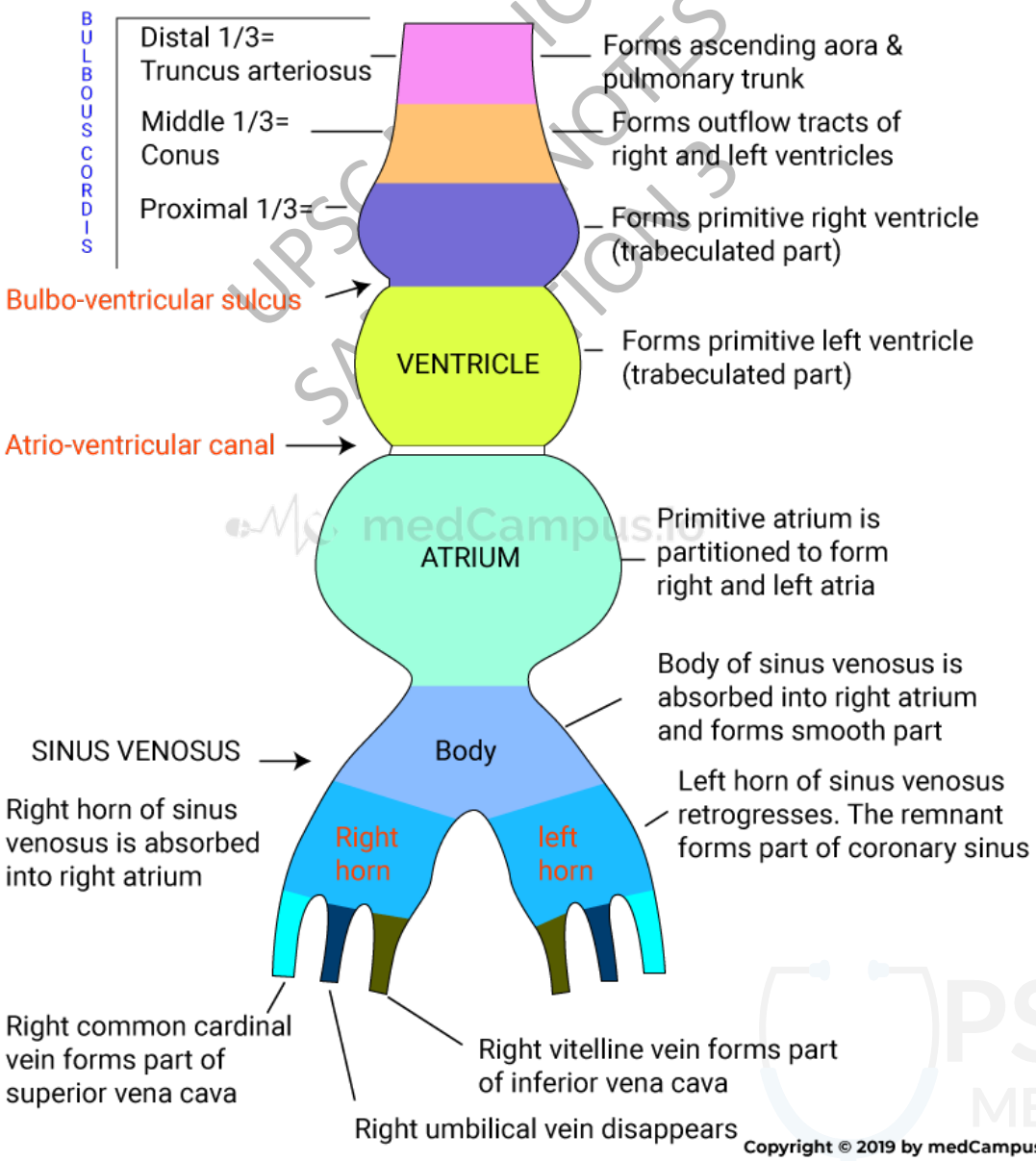
## 1) The Development of Heart Tube




(A) Right and left heart tubes. (B) to (D) Progressive fusion of tubes from cranial to caudal end. Fusion of sinus venosus is partial.

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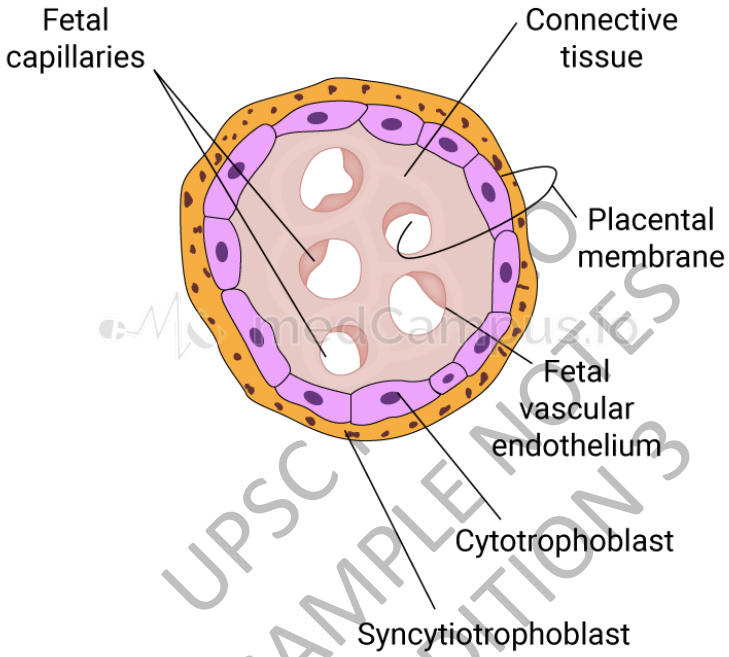
## 2) Growth and folding of the heart tube




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**PLACENTAL MEMBRANE**

Semipermeable membrane that separates the fetal from the maternal blood in the placenta.
In the human (hemochorial) placenta, it is composed of fetal vascular endothelium, connective tissue, cytotrophoblast, and syncytiotrophoblast, and it becomes thinner as pregnancy progresses.
Sometimes inappropriately called the placental barrier; there are only a few substances that cannot pass through the membrane.

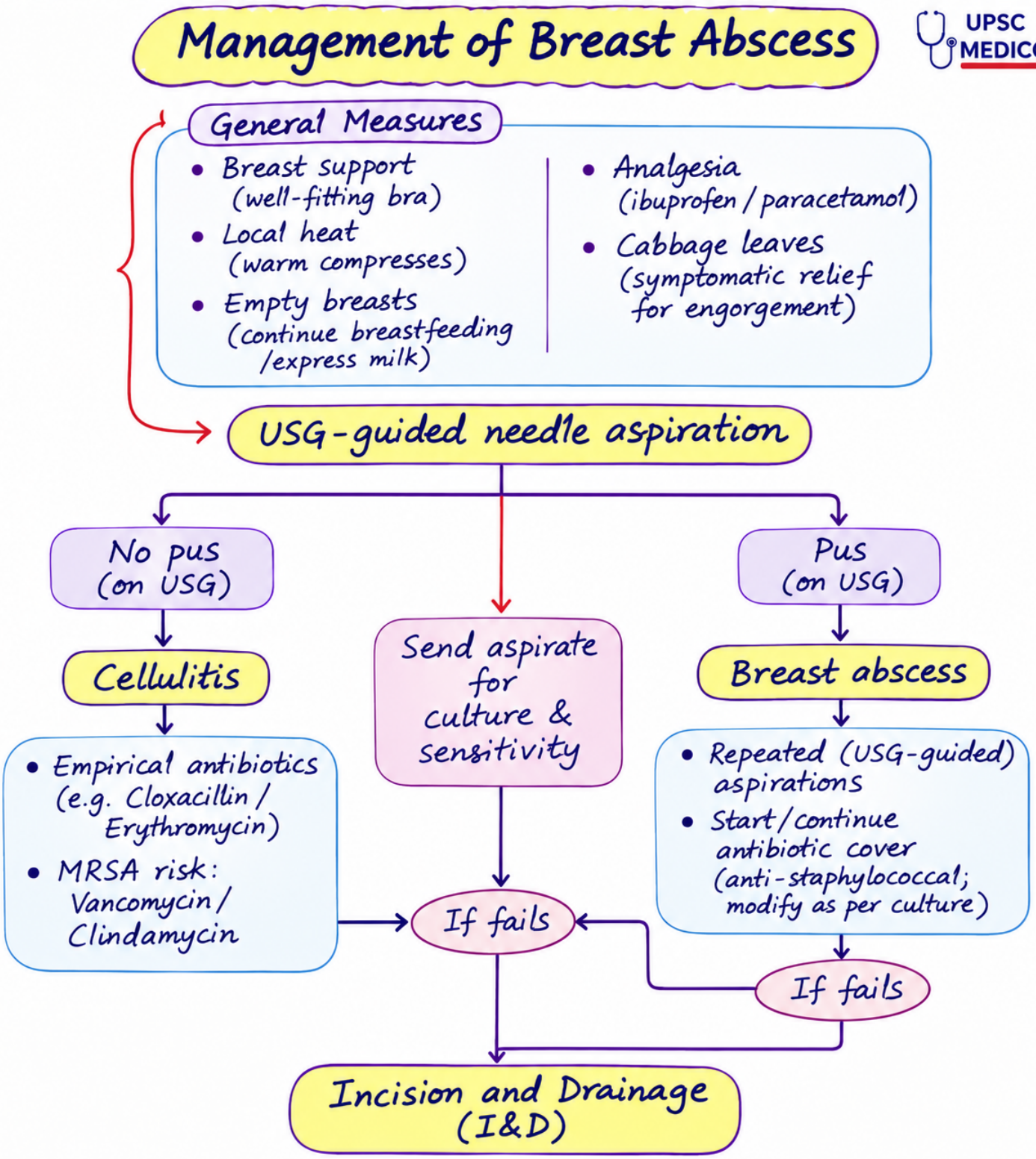



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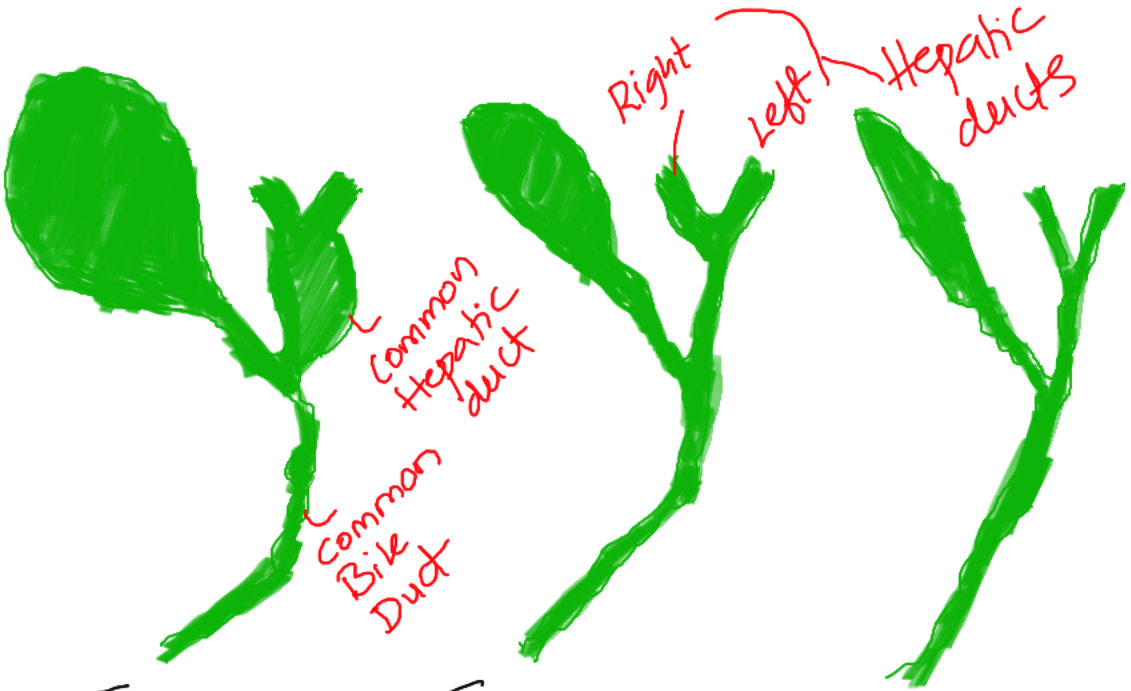
**PLACENTAL MATURATION**

| Age of the placenta | Morphology |
|---|---|
| < 21 days | Presence of both trophoblast cell layers (the cytotrophoblast and the syncytiotrophoblast) in the absence of vessels |
| 21days-5 months | Fetal vessels and red blood cells, along with two cell layers of trophoblast |
| > 5 months | Cytotrophoblast thins out. |
| Towards Term | • Weight 500 g<br>• The mesenchymal core of each villus becomes more dense and compact<br>• Fetal vessels appear to be much closer to the overlying syncytiotrophoblast (Facilitating transfer of nutrients or waste products)<br>• Fibrin deposition within the intervillous space<br>• Occasional syncytial knots |

# General Surgery Content with Special emphasis on Principles of surgery in management



# Grading of biliary atresia




**Type I**

CBD - Atresia
CHD - patent
R/L HD - patent

**Type II**

CBD - Atresia
CHD - Atresia
R/L HD - patent

**Type III**

CBD/CHD/
R/L HD
Atresia

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**IUCDs**

Intrauterine contraceptive devices (IUCDs) are placed in the uterine cavity with the objective of providing long-term contraception, mainly by preventing fertilization.

| | |
|---|---|
| **Copper-carrying devices (2nd Gen)**<br>• Copper T 200<br>• Copper 7<br>• Multiload Copper 250<br>• Copper T 380A-Paraguard (Life span-10 years)<br>• Copper T 220<br>• Nova T (Life span 5 years due to addition of silver) | They have an effective life of about 3–5 years. It is estimated that about 50 mcg of copper is eluted daily in the uterus. Associated with menstrual problems like menorrhagia and dysmenorrhea. |
| **Progesterone containing IUCDs (3rd Gen)**<br>• Progestasert (Life span 1 year)<br>• Levonova-60 mg LNG (Life span 5 years)<br>• Mirena- (Life span 5 years) | Menstrual problems like menorrhagia and dysmenorrhoea noticed with Copper T are less with this device (40% reduction). However, the incidence of ectopic pregnancy is sixfold to ninefold higher in women who do become pregnant with progestogen IUCD as compared to failures amongst Copper T users.<br>Expensive too.<br>Safe in lactating mothers. |
| **Frameless IUCDs (4th Gen)**<br>• Fibroplant<br>• Gyneflex<br>• Essure | Because it is small in size, complications such as pain, bleeding, ectopic pregnancy and expulsion are less reported |

UPSC MEDICO SAMPLE NOTES EDITION 3

**Indications (Patient Selection)**

IUCDs are a good contraceptive choice for the following groups of women:

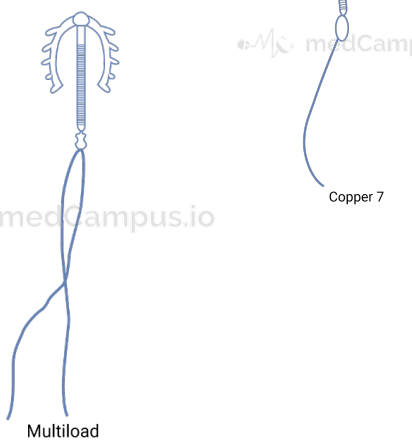
Low risk of STD

Multiparous woman

Monogamous relationship

Desirous of long-term reversible method of contraception, but not yet desirous of permanent sterilization

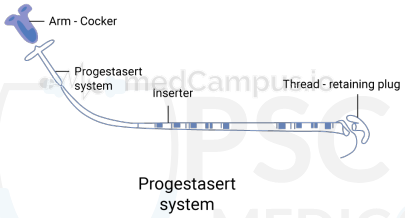
Unhappy or unreliable users of oral contraception or barrier contraception



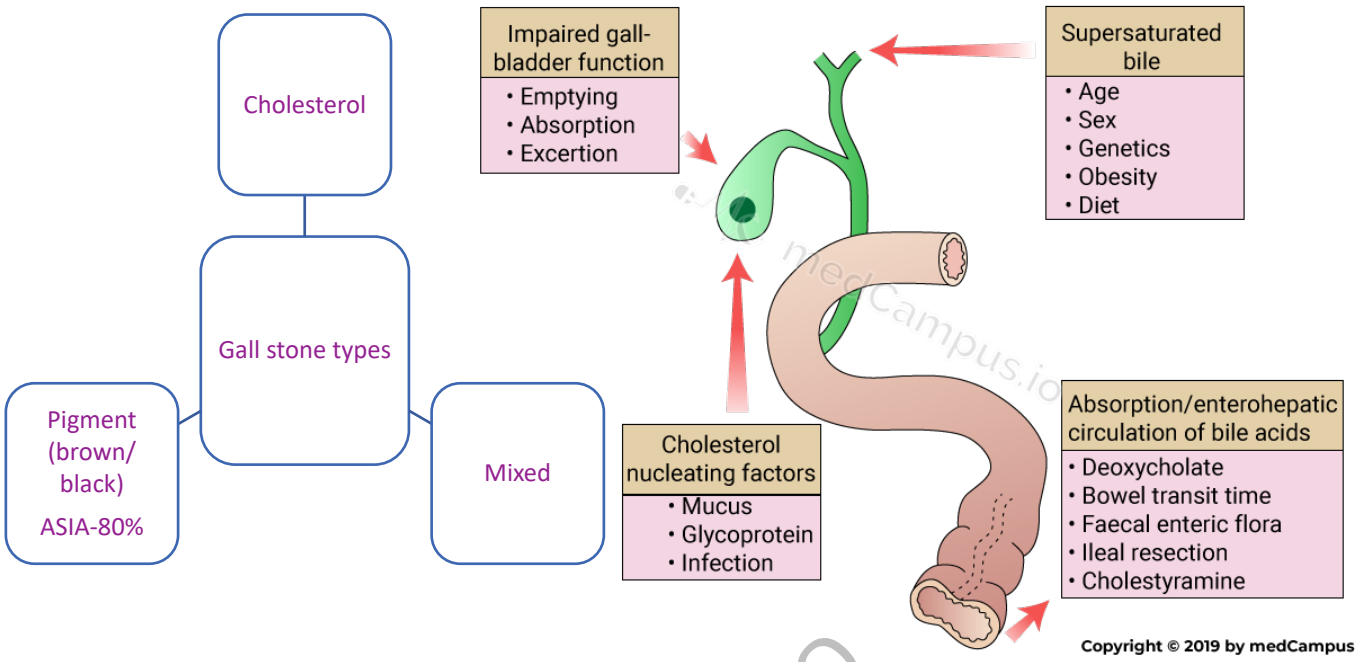






## Gall stones Etiopathogenesis




5-F Syndrome—fair, **fat**, **female**, fertile and over**forty**

| **Cholesterol stones (or mixed)** | **Pigment stones** |
|---|---|
| USA (80%)<br>Contains-51-99% pure cholesterol plus an admixture of calcium salts, bile acids, bile pigments and phospholipids<br>**<u>Pathogenesis</u>**<br>Interplay between **cholesterol-bile acids-phospholipids (lecithin)**<br><br>**Increase in cholesterol or decrease in bile acids or lecithin leads to nucleation of cholesterol crystals, in turn forming gall stones**<br>• Abnormal emptying of gall bladder leads to aggregation of cholesterol crystals<br>• Resection of terminal ileum, leads to depletion of bile acid pool<br>• Obesity, high caloric diet and OC pills increase cholesterol secretion | Asia (80%)<br>Contain less than 30% of cholesterol<br>1. Black stones<br>- Contains insoluble bilirubin pigment polymer mixed with calcium phosphate and calcium carbonate<br>- Associated with hemolysis (HS, Sickle cell anemia)<br>-<br>2. Brown stones<br>- Contains calcium bilirubinate, calcium palmitate and calcium stearate<br>- Rare in gall bladder<br>- They form in bile duct due to stasis and infection<br>- It is due to deconjugation of bilirubin deglucuronide by bacterial beta-glucuronidase<br>- Associated with presence of foreign bodies in the bile ducts (stents) or parasites such as Clonorchis sinensis and Ascaris lumbricoides |

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## Breast carcinoma-Treatment

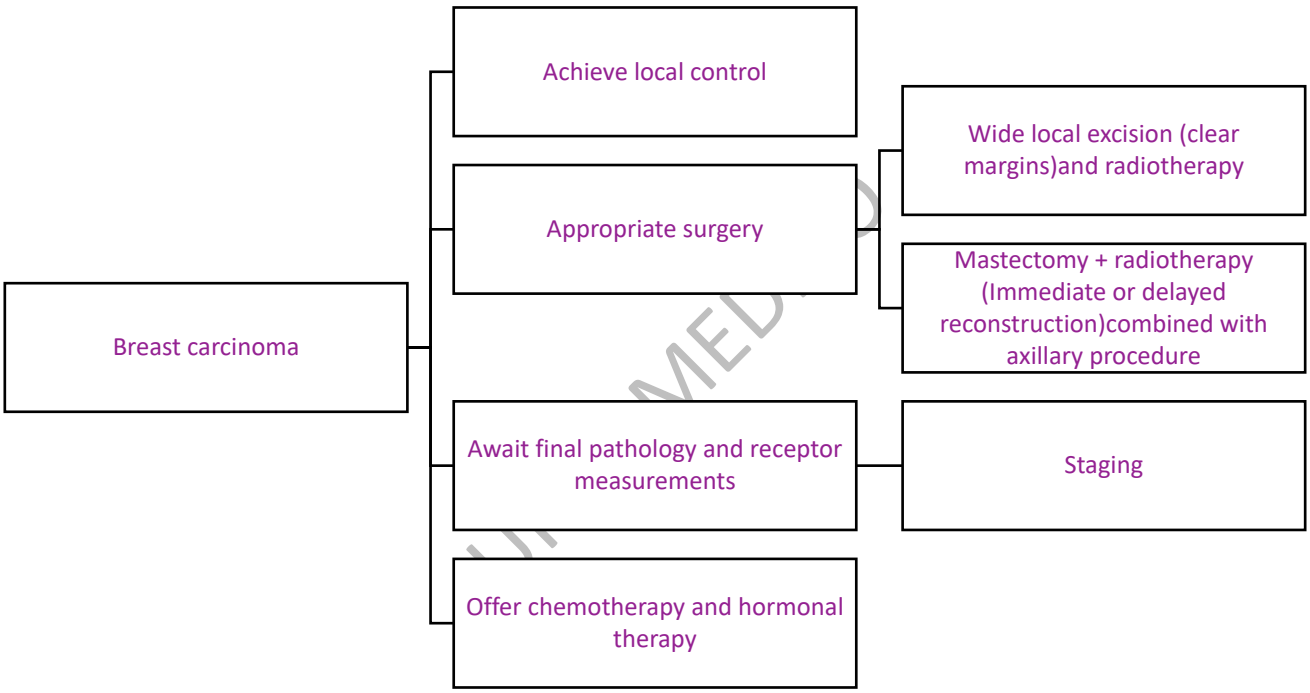
**The two basic principles of treatment are to reduce the chance of local recurrence and the risk of metastatic spread.**

Treatment of early breast cancer (tumor limited to breast and hasn't spread to lymph nodes) will usually involve surgery with or without radiotherapy.

Systemic therapy such as chemotherapy or hormone therapy is added if there are adverse prognostic factors such as lymph node involvement, indicating a high likelihood of metastatic relapse.

At the other end of the spectrum, locally advanced or metastatic disease is usually treated by systemic therapy to palliate symptoms, with surgery playing a much smaller role.

## Algorithm for management of operable breast cancer




After mastectomy women tend to worry about the effect of the operation on their appearance and relationships, whereas after conservative surgery they may remain fearful of a recurrence.

**Local treatment of early breast cancer**

**MASTECTOMY**

**Indications**

1. Large tumors relative to the size of the breast
2. Central tumors beneath or involving the nipple
3. Multifocal disease
4. Local recurrence
5. PATIENT PREFERENCE

- **Simple mastectomy**-Removal of breast + axillary tail
- **Patey mastectomy**-Removal of breast + axillary tail + axillary lymph nodes **(PREFERRED)**
- **Halsted radical mastectomy**-Removal of breast + axillary tail + axillary lymph nodes + Pectoralis major and minor (NO LONGER INDICATED)

**UPTO DATE TREATMENT PROTOCOLS IN SURGICAL ONCOLOGY**

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# LATEST PSM UPDATES

**Current LF overview in INDIA**
333 endemic districts in 2023

136 districts cleared TAS 1 & in Post MDA surveillance
176 districts reported more than 1% microfilaria (mF) rate and are under MDA

75% of MDA districts are from 5 states of Bihar, Jharkhand, UP, Odisha and chhattisgarh.
5.5 lakhs Lymphedema cases till 2022 (provisional)
1.5 lakhs Hydrocele cases till 2022 (provisional)

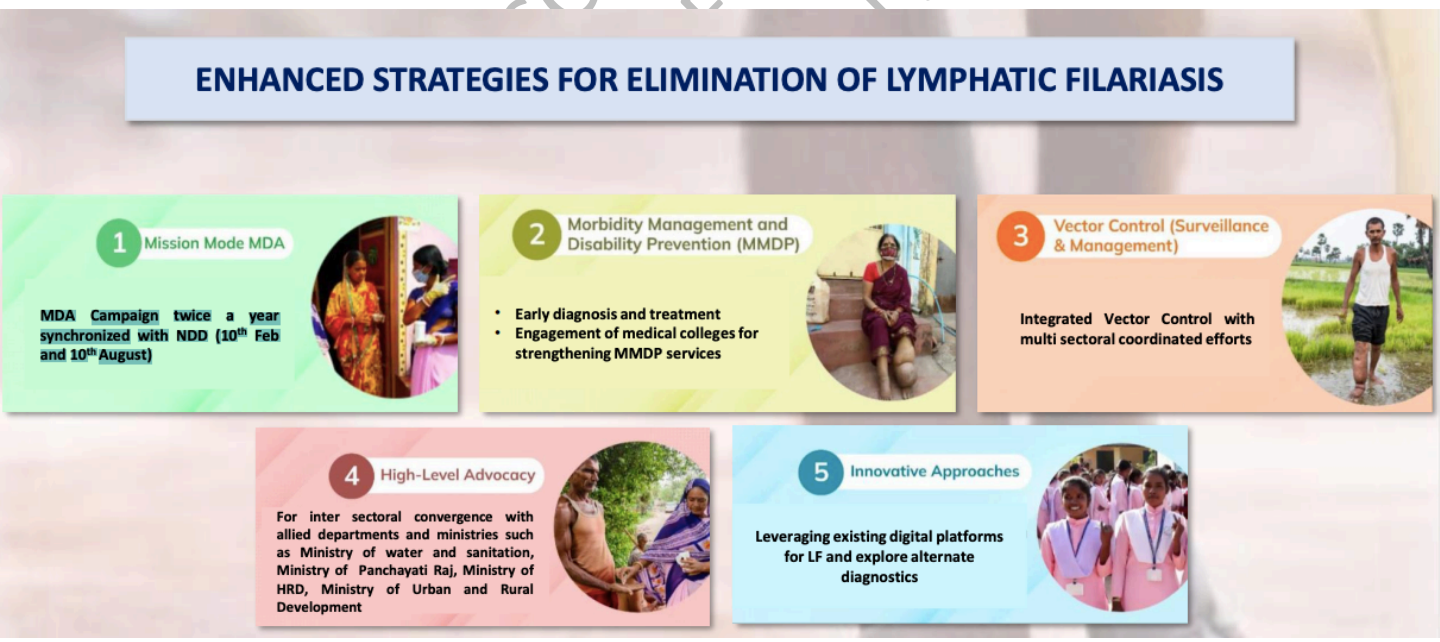
**Building India's Roadmap to Eliminate Lymphatic Filariasis by 2027**

For India, LF is not a Neglected Disease, but a Priority Disease for Elimination

National Center for Vector Borne Disease Control (NCVBDC) in collaboration with Global Health Strategies (GHS) and its partners organized a National Symposium on Building India's Roadmap to Eliminate Lymphatic Filariasis by 2027 - three years ahead of the global target, through the five-pronged roadmap.

**A renewed five-pronged strategy for elimination of LF is as follows:**

1. Multi-drug administration (MDA) Campaign twice a year synchronized with National Deworming Day (10th Feb and 10th August)
2. Early diagnosis and treatment; engagement of medical colleges for strengthening Morbidity management and disability (MMDP) services
3. Integrated Vector Control with multi sectoral coordinated efforts
4. For inter sectoral convergence with allied departments and ministries
5. Leveraging existing digital platforms for LF and exploring alternate diagnostics




**ABOUT MDA : MASS DRUG ADMINISTRATION**

- Mass Drug Administration of single dose medication for 5 years or more to the eligible population (except pregnant women, children below 2 years of age and seriously ill persons) to interrupt transmission of the disease.
- MDA started as mass campaign from 2004. Initially with single dose of DEC only.
- In the year of 2007 with DEC + Albendazole co-administration
- Form 2018 Triple Drug Therapy (IDA) i.e. **DEC + Albendazole + Ivermectin** is launched initially in five selected districts. Since elimination target is approaching first all the left out districts which are yet to achieve elimination will be brought under IDA.

# ANEMIA MUKT BHARAT ABHIYAAN 2026

## MAJOR CHANGES – QUICK REVISION

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### 1. TRANSITION

From **Anemia Mukt Bharat** (AMB)
to **Anemia Mukt Bharat Abhiyaan** (AMB Abhiyaan)

More comprehensive, people-centric & technology-enabled approach

### 2. NEW 7x7x7 STRATEGY

**7th Beneficiary Group**
Low Birth Weight (LBW) babies (0–6 months)

**7th Intervention**
"Eating Right" – Iron-rich & diversified diet as daily habit

**7th Institutional Mechanism**
Strengthened Monitoring & Evaluation (M&E) with digital tracking

### 3. T4 APPROACH (Earlier T3)

**TEST** → Regular Hb testing

**TREAT** → Treatment as per national anemia protocols

**TALK** → Counselling on nutrition & diet

**TRACK** → Digital follow-up, referral & monitoring

**T4 = Test, Treat, Talk & Track**

### 4. STRENGTHENED CLINICAL MANAGEMENT

For pregnant & lactating women with severe anemia or non-responders to oral iron:

**IV Iron Therapy – Ferric Carboxymaltose (FCM) & Iron Sucrose**

### 5. DIGITAL INTEGRATION

**JANANI Portal** (Pregnant Women) → **RBSK Portal** (Children) → **U-WIN Portal** (Child Health) →

**Unified AMB Abhiyaan Portal**
For comprehensive monitoring & analysis

### 6. JAN BHAGIDARI / JAN CHETNA

Nationwide participation & community engagement to accelerate anemia reduction

**GOAL:** Accelerate progress towards a healthier and **ANEMIA MUKT BHARAT**

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# SUMAN ROADMAP 2030
## HIGHLIGHTS

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Empowering Doctors Creating Leaders

**SUMAN** = Surakshit Matritva Aashwasan

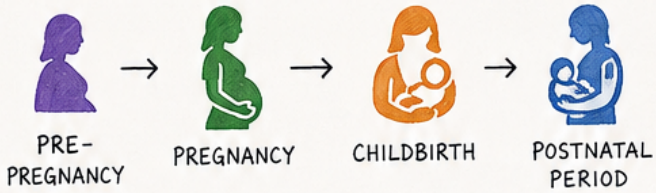
Launched by MoHFW on 29 June 2026 to accelerate progress towards SDGs for maternal & newborn health.

### KEY GOALS

- MMR < 70/1 lakh live births by 2030
- Reduce NMR & IMR
- Achieve universal saturation of quality maternal & newborn health services
- Ultimately achieve zero preventable maternal & newborn deaths

### LIFE-CYCLE APPROACH

Under RMNCHA+N




Convergence with child health, adolescent health, family planning & nutrition.

### HIGH-RISK PREGNANCY – 4 STAGE TRACKING

1. Antenatal period
2. Third trimester
3. Intrapartum period
4. Postnatal period

→ Early identification + tracking + timely management of high-risk pregnancies

### FOCUSED INTERVENTION

130 districts in 13 high-focus States:

Assam, Bihar, Chhattisgarh, Haryana, Jharkhand, Karnataka, Madhya Pradesh, Odisha, Punjab, Rajasthan, Uttar Pradesh, Uttarakhand & West Bengal.

### KEY INTERVENTIONS

- SUMAN Package for pregnant women
- Early registration + complete ANC
- Quality clinical assessment
- Adequate postpartum institutional stay
- Bi-weekly ASHA home visits during 8th & 9th months
- Birth preparendenss + danger-sign identification
- Nutrition counselling
- Referral transport for obstetric emergencies
- Birth Waiting Homes
- Maternal & Child Health Wings
- Obstetric HDU/ICU strengthening



### NEW / IMPORTANT INNOVATIONS

- AI-enabled labour rooms
- JANANI Portal for digital monitoring
- Climate-responsive maternal & newborn care
- NASG for obstetric haemorrhage
- Strengthening MDSR & Maternal Near-Miss reviews
- Optimisation of Caesarean section practices
- SSBSK integration for home-based care from birth to 36 months

### COMMUNITY & HEALTH-SYSTEM STRENGTHENING

SUMAN PANCHAYATS | MOTHERS' PICNIC | CENTRES OF EXCELLENCE | CENTRALISED SUMAN CALL CENTRE | STRONGER REFERRAL LINKAGES | DIGITAL MONITORING & GRIEVANCE REDRESSAL

### UPSC ONE-LINER

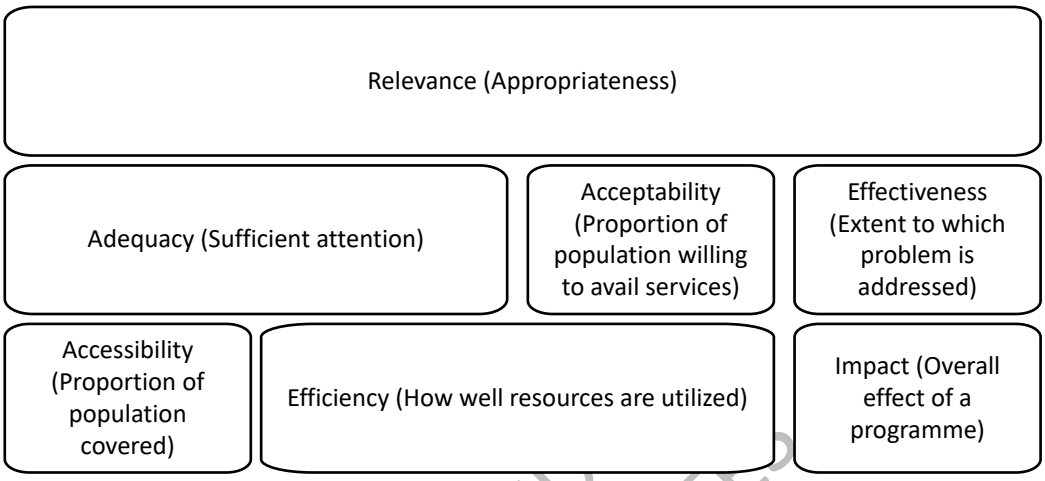
SUMAN Roadmap 2030 = RMNCHA+N + 4-stage HRP tracking + 130 districts/13 States + digital/AI innovations + community participation → MMR < 70 + zero preventable maternal & newborn deaths by 2030.

## Evaluation of health services

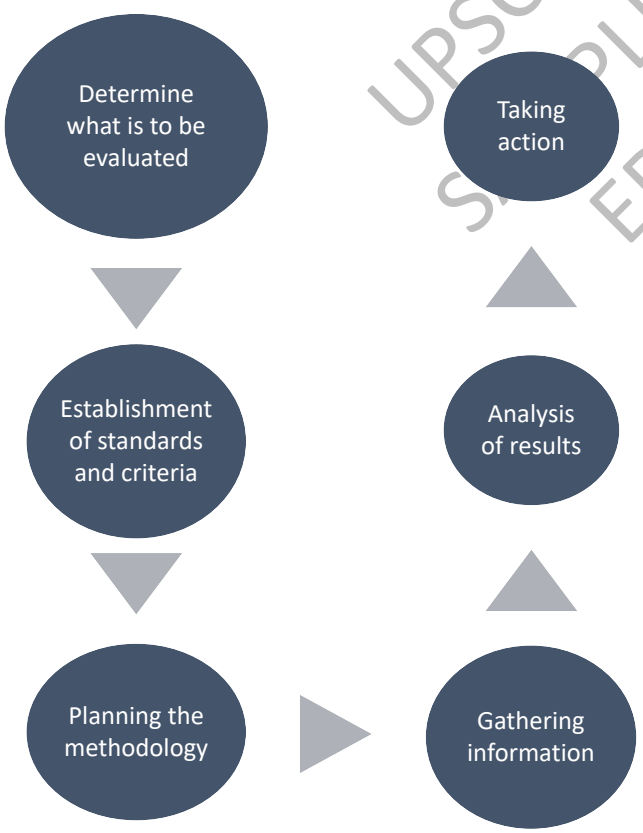
An evaluation study addresses following issues/Questions raised/concerns

1) Quality of health care
2) Utilization and coverage of health services
3) Benefits to community health in terms of morbidity and mortality reduction
4) Improvement in health status of the recipients of care

## Elements of evaluation of health services




## General steps of evaluation of health services



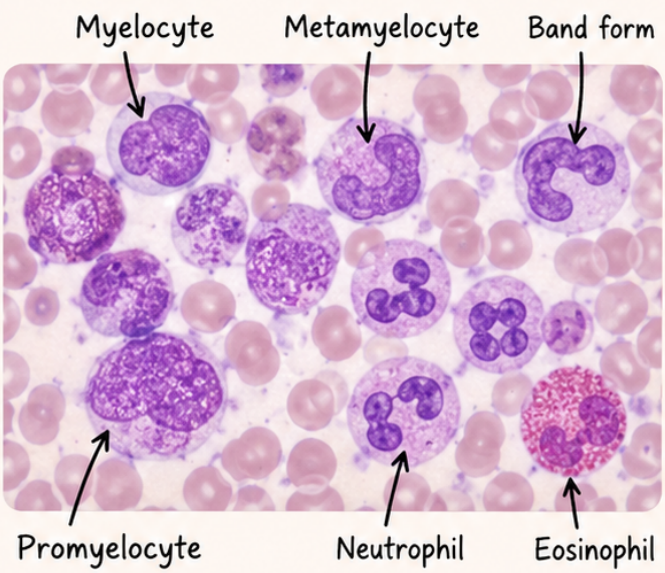

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SAMPLE NOTES
EDITION 3

SMART ARTS FOR BETTER LEARNING

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# CML

## Peripheral blood smear



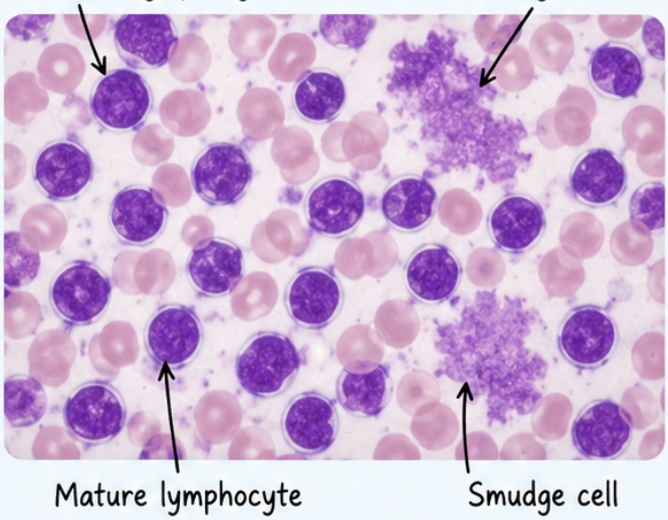

### "Garden party appearance"



Due to presence of all stages of granulocytic maturation

# CLL

## Peripheral blood smear




### "Convent girls appearance"



Due to predominance of small, mature, monotonous lymphocytes

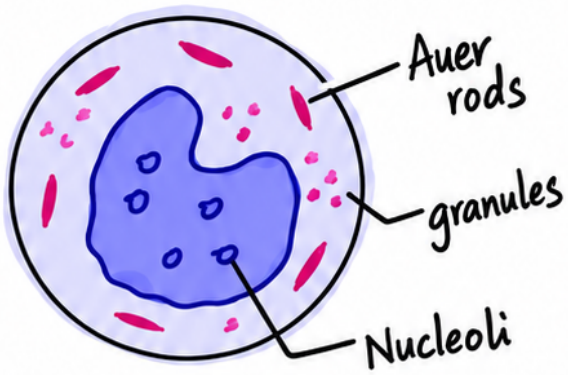
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**HISTOPATHOLOGY IMAGES WITH PROPER LABELLING AND COLOR CODING**

# Myeloblast vs Lymphoblast

## Myeloblast

**Size:** 20 µm




**Nucleus :**
- Curved
- Smaller in comparison to lymphoblast
- Fine chromatin
- 2-5 nucleoli (prominent)

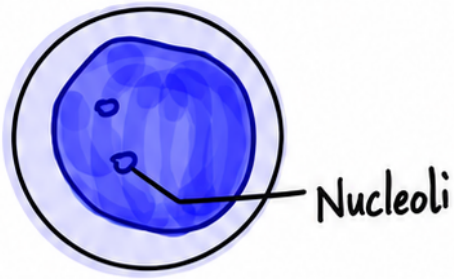
**Cytoplasm :**
- Blue / Slanty / Granular
- Auer rods +

**Differentiates into :**
- Eosino / Baso / Neutro phils

**Histochemistry :**
- MPO +

## Lymphoblast

**Size:** 15 µm




**Nucleus :**
- Large / Rounded

**Chromatin :**
- Clumped chromatin
- 1-2 nucleoli (inconspicuous)

**Cytoplasm :**
- Blue / Scanty
- Auer rods −

**Differentiates into :**
- T / B lymphocytes

**Histochemistry :**
- MPO −
- PAS + Glycogen granules

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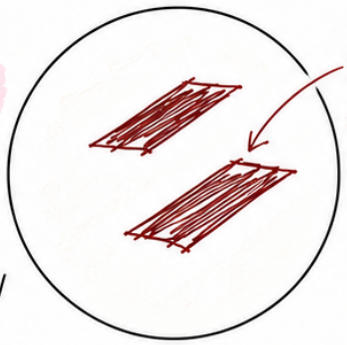
# Stain for Biological Evidence

## Presumptive tests for Seminal stains

### Florence test

**Reagent**

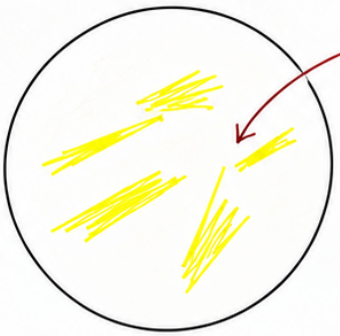
Iodine 8% w/v + KI 5% w/v




### Barberio's test

**Reagent**

Picric acid (saturated)

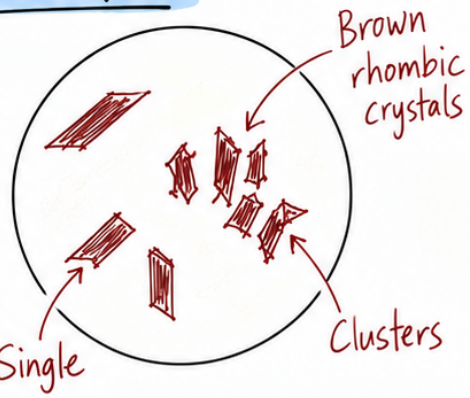



## Confirmatory tests for Blood stains

### Teichmann test

**Reagent**

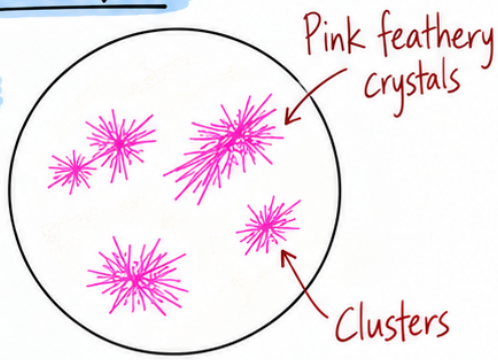
NaCl + Glacial acetic acid




### Takayama test

**Reagent**

Pyridine + NaOH + Glucose



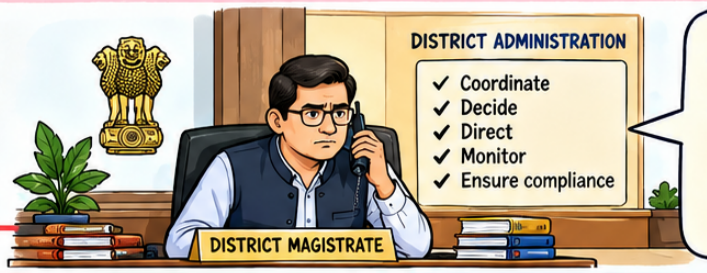

MEDICAL SCIENCE OPTIONAL

**HAND DRAWN IMAGES IS THE MOST IMPORTANT UDPATE**

# MEDICO-LEGAL FORMALITIES IN A SHOPPING MALL FIRE

## ROLE OF THE DISTRICT MAGISTRATE

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### NODAL AUTHORITY

- Overall in-charge of the disaster response
- Coordinates all departments (police, fire services, health, revenue, municipal authorities)
- Ensures medico-legal, administrative and legal formalities are properly carried out

### 1 IMMEDIATE RESPONSE AND RESCUE

- Activate disaster management mechanism.
- Direct fire services, police and health department for rescue and evacuation.
- Arrange ambulances, hospitals, burns units and blood bank support.
- Set up a casualty collection / relief centre.
- Ensure proper triage and emergency medical care.



### 2 RECORDING AND DOCUMENTATION

- Maintain a record of all injured persons (name, age, address, hospital, condition).
- Separate list of dead, injured, missing and rescued persons.
- Document time, place and circumstances of the incident.
- Preserve CCTV footage, staff records and available evidence.




### 3 HANDLING OF DEATHS (IDENTIFICATION)

- Tag, photograph and properly document each body.
- Preserve clothing, personal belongings and other identifying material.
- Maintain chain of custody.
- Create missing persons register and match with unidentified bodies.



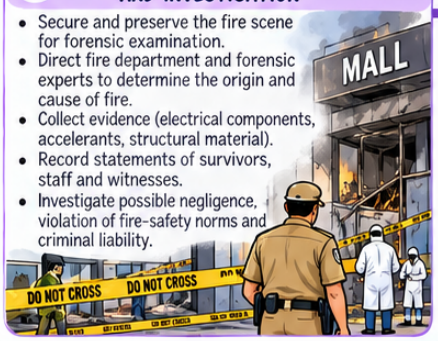
### 4 POST-MORTEM EXAMINATION

- Inform police and executive magistrate.
- Arrange medico-legal post-mortem examination.
- Obtain fingerprints, dental records, photographs and DNA samples, especially in charred bodies.
- Ensure bodies are not released until proper identification and legal formalities are completed.



### 5 PRESERVATION OF SCENE AND INVESTIGATION

- Secure and preserve the fire scene for forensic examination.
- Direct fire department and forensic experts to determine the origin and cause of fire.
- Collect evidence (electrical components, accelerants, structural material).
- Record statements of survivors, staff and witnesses.
- Investigate possible negligence, violation of fire-safety norms and criminal liability.




### 6 DISPOSAL AND HANDOVER OF BODIES

- After completion of medicolegal formalities, hand over bodies to relatives following proper identification and documentation.
- Unclaimed bodies should be disposed of as per applicable legal/local procedures.




### 7 RELIEF, COMPENSATION AND SUPPORT

- Maintain consolidated record of casualties.
- Notify state government and disaster management agencies.
- Arrange compensation/relief as per government provisions.
- Provide psychological support and rehabilitation to survivors and families.



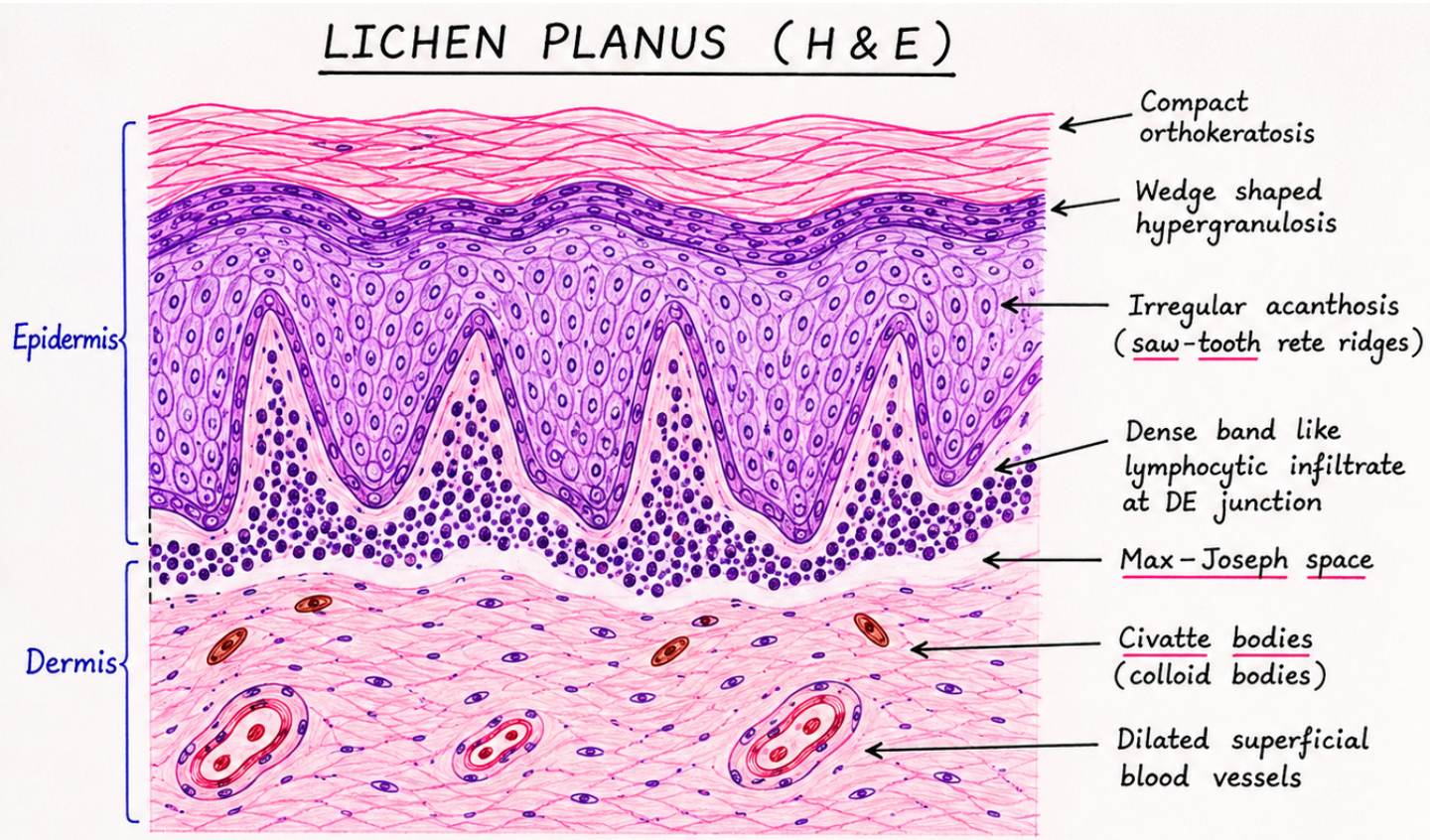

### 8 FINAL REPORT AND PREVENTIVE MEASURES

- Prepare a detailed disaster report (casualties, cause of fire, response and gaps).
- Recommend preventive measures and ensure compliance with fire-safety regulations in public buildings like malls.




**FORENSIC MEDICINE NOTES NOW CONTAINS ALL MEDICO LEGAL APPROACH PATTERNS**

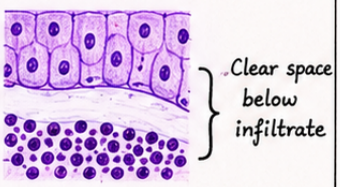
# LICHEN PLANUS (H & E)



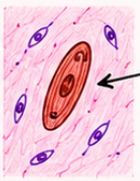

**KEY FEATURES :**

1. Hyperkeratosis (compact orthokeratosis)
2. Wedge shaped hypergranulosis
3. Irregular acanthosis – Saw tooth appearance
4. Dense band like lymphocytic infiltrate at DE junction
5. Max – Joseph space
6. Civatte (colloid) bodies
7. Dilated superficial blood vessels in dermis

**Max – Joseph Space**




**Civatte Body**




**MAJOR FOCUS ON DERMO HISTO PATHOLOGY**

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# Previous Year Paper Model Answers
# SAMPLES

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SAMPLE NOTES

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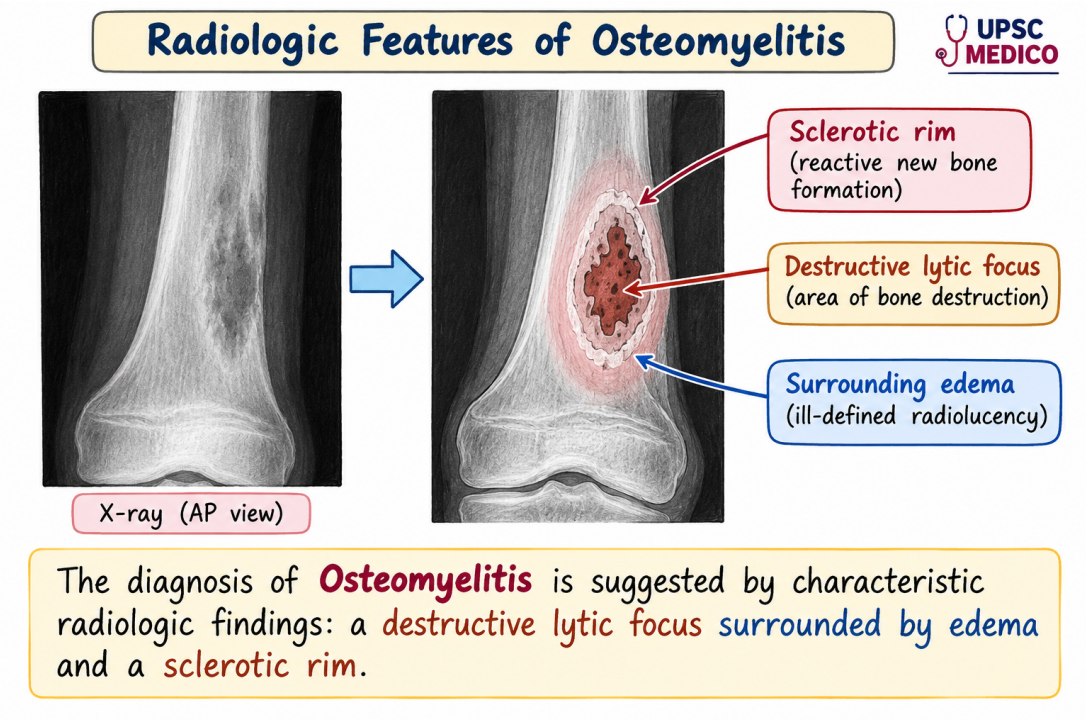
**5.c. A 16-year-old boy presented with fever, chills and malaise. On history, he revealed intense throbbing pain around the right knee. X-ray of the knee revealed a lytic focus of bone destruction surrounded by a zone of sclerosis.**
**(i) What is the most probable diagnosis?**
**(i) Describe the pathogenesis of this condition.**
**(il) Enumerate four complications. (10)**

**PYQs**
**Give the aetiopathogenesis and gross and microscopic features of acute osteomyelitis. (2012)**
**Describe the pathological changes and complications of Acute Osteomyelitis. (2014)**
**Give the etiopathogenesis, Gross, and microscopic picture of Acute bacterial osteomyelitis (2019)**

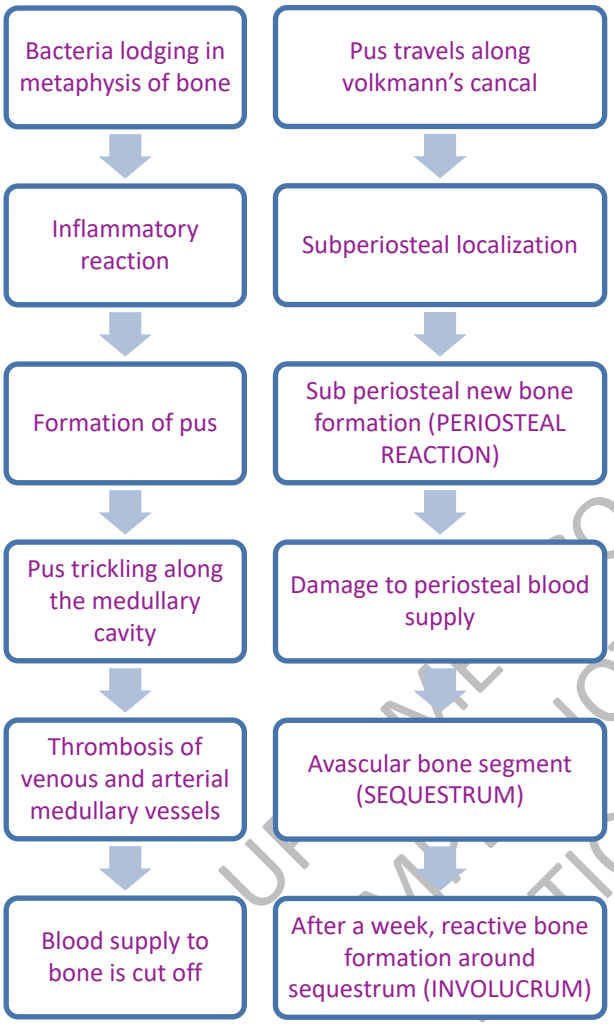
Clinical scenario:
16 year old boy
C/O Fever + Pain around right knee
X-Ray knee: Lytic focus of bone destruction surrounded by a zone of sclerosis

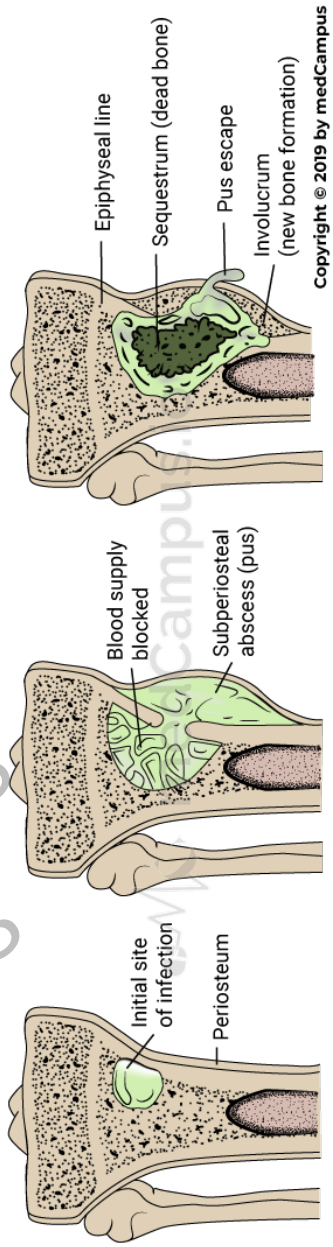
**Most probable diagnosis: Acute osteomyelitis**

*Osteomyelitis* is defined as inflammation of bone and marrow, but in common use it is virtually synonymous with infection. Osteomyelitis classically manifests as an acute systemic illness, with malaise, fever, leukocytosis, and throbbing pain over the affected region.



## Pathogenesis




## Complications

The important complications are : -

i) Septicemia and pyemia

ii) Septic arthritis

**iii) Chronic oseomyelitis (most common complication)**

iv) Metastatic infection to other bones, serous cavities, Lung or brain.

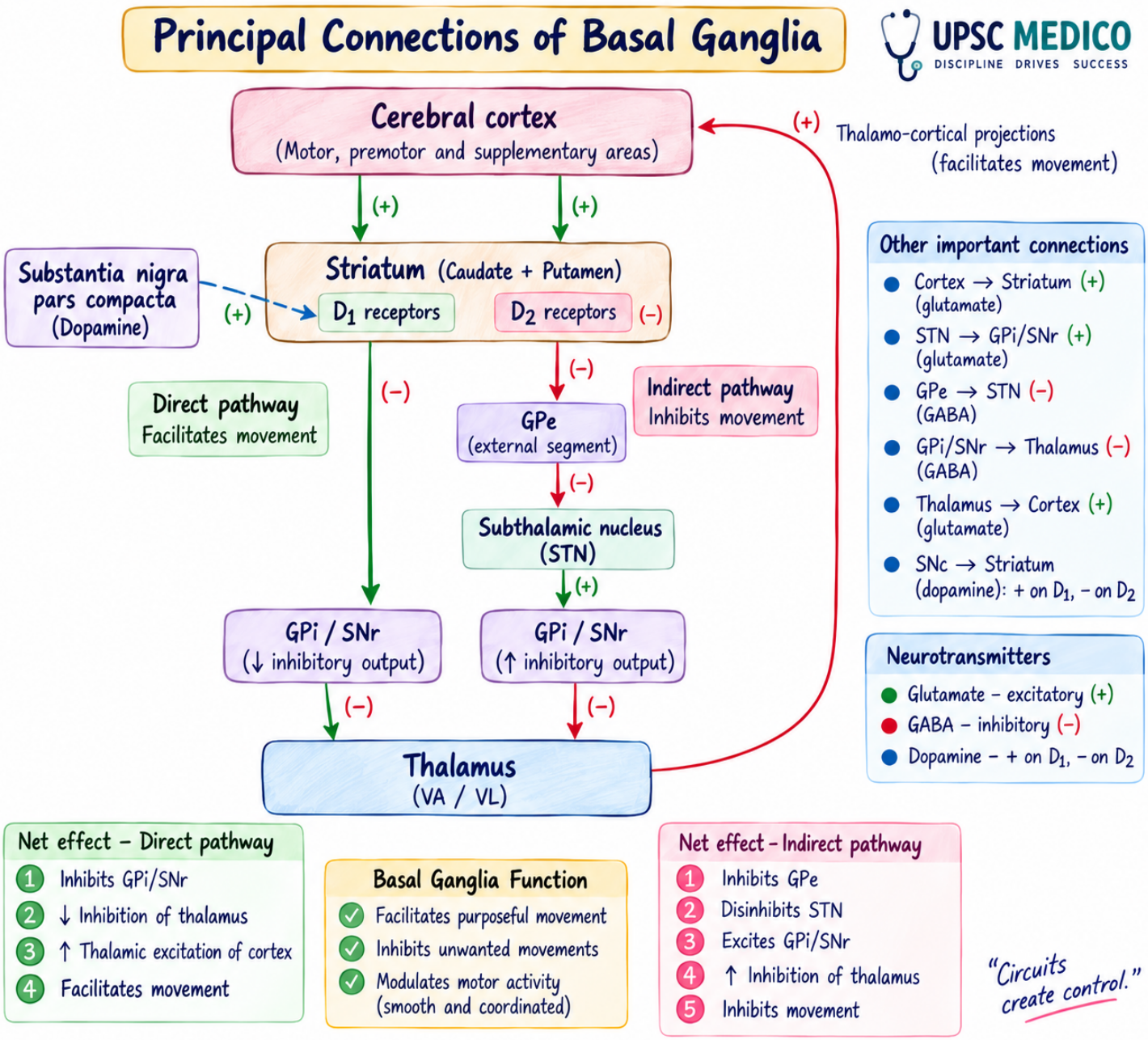
v) Pathological fracture

vi) Altered growth from damage to epiphyseal growth plate.

**Sinus tract malignancy and soft tissue contractures are complications of chronic osteomyelitis**

**1.e. With the help of a suitable well-labelled diagram, explain the principal connections of basal ganglia (10)**

Describe the functions of basal ganglia involuntary actions. Compare the functions of basal ganglia with primary cortex. (2017)
Describe the pathophysiology and clinical features of Parkinson's disease. Give a brief account of the physiological basis of its treatment. (2020)
Discuss the functions of basal ganglia. Add a note on Parkinson's disease. (2022)



UPSC MEDICO | Medical Science Optional

# Course Comparison – Edition 3.0

*Choose the learning plan that suits your preparation timeline.*

| Features | Plan A | Plan B | Plan C | Combo Course |
|---|---|---|---|---|
| Edition 3.0 Video Lectures | ✓ | ✓ | ✓ | ✓ |
| Edition 3.0 Digital Notes | ✓ | ✓ | ✓ | ✓ |
| Supplementary Handouts | ✓ | ✓ | ✓ | ✓ |
| Test Series | — | — | — | ✓ Included |
| Test Series Schedule | — | — | — | Flexible |
| Course Validity | 3 Months | 6 Months | 12 Months | **24 Months** |

## Understand the Difference

### Video Courses – Plans A, B & C

All three plans provide the same Edition 3.0 video lectures, digital notes and supplementary handouts.

- **Plan A :** 3-month validity
- **Plan B :** 6-month validity
- **Plan C :** 12-month validity

### Combo Course

Extended Package

Includes everything offered in Plans A, B and C, along with:

- ✓ Additional Test Series access.
- ✓ Flexible test-taking schedule.
- ✓ Extended 2-year course validity (24 months).

**Important**

The video lectures and teaching content remain the same across all four options. The difference lies in the validity period and the additional Test Series access offered with the Combo Course.

*Whether you need an intensive three-month preparation plan or a longer preparation window,* **UPSC MEDICO** *has an* ***Edition 3.0*** *plan to match your timeline.*

For any further assistance or help with course enrolment, contact us at

8978-444-188

Enrol on our website: upsc.medcampus.io | Email us at: dr.naveen@medcampus.io