PATHOLOGY

RENAL

Azotemia and uremia

AZOTEMIA is an elevation of **blood urea nitrogen** (BUN) and serum **creatinine** levels.

- azotemia gives rise to ***clinical manifestations*** and systemic biochemical abnormalities, it is termed uremia
- **UREMIA** Glomerular filtration rate falls below **60 ml/min** which causes very **high plasma concentration of urea**

Types of azotemia

- Prerenal (Excessive blood loss or rapid fluid depletion),
- Intrinsic (Renal diseases by itself),
- Postrenal (Renal- pelvic obstruction, Ureteric obstruction, Bladder- urethral obstruction).

For BUN is 8-20 mg/dL,

For serum creatinine is 0.7-1.4 mg/Dl,

Normal glomerular filtration rate is 125ml/min.

Classification of Glomerular Diseases

Syndrome	Characteristics	Examples
Nephrotic Syndrome	- Heavy **proteinuria** (>3.5 g/day). - **Hypoalbuminemia**, edema. - **Hyperlipidemia** and **lipiduria**. - Minimal hematuria.	- Minimal Change Disease (MCD). - Focal Segmental Glomerulosclerosis (FSGS). - Membranous Nephropathy. - Membranoproliferative GN (can also have nephritic features). - Amyloidosis. - Diabetic nephropathy.
Nephritic Syndrome	- **Hematuria** (dysmorphic RBCs, RBC casts). - **Oliguria**, azotemia. - Mild proteinuria. - **Hypertension**.	- IgA Nephropathy. - Rapidly Progressive Glomerulonephritis (RPGN). - Post-streptococcal GN. - Membranoproliferative GN (can also have nephrotic features). - Lupus nephritis.

Nephrotic vs. Nephritic Syndromes – Key Points

Feature	Nephrotic Syndrome	Nephritic Syndrome
Pathophysiology	**Podocyte injury** leading to increased permeability to proteins.	**Immune complex** deposition causing inflammation.
Microscopy	Fatty casts in urine. (FOAMY)	RBC casts in urine. (COLA COLOURED)
Diseases	Minimal change disease, FSGS, membranous nephropathy.	Post-streptococcal GN, IgA nephropathy, RPGN.

Acute Tubular Necrosis (ATN)

Acute **injury** to renal tubules causing **necrosis** and **loss of function**, leading to acute kidney injury (**AKI**).

Causes

1. **Ischemic ATN**: Reduced blood flow to kidneys (shock, sepsis, dehydration)
2. **Nephrotoxic ATN**: Direct toxic damage by substances (aminoglycosides, contrast media, heavy metals, myoglobin)

Pathophysiology

- Injury to tubular epithelial cells → cells slough off into the lumen → obstruction and backleak → reduced GFR.
- Commonly affects **proximal tubules** and **thick ascending limb**.

Clinical Features

- Oliguria or anuria (reduced urine output)
- Azotemia (↑ BUN, creatinine)
- Muddy brown casts in urine
- Hyperkalemia, metabolic acidosis

Diagnosis

- **Urine microscopy**: Muddy brown granular casts
- **Blood tests**: Elevated creatinine, BUN
- **Fractional excretion of sodium (FENa)** >2% (helps distinguish from prerenal causes)

Management

1. **Supportive care**: Maintain blood pressure and hydration
2. **Dialysis**: If severe (acidosis, hyperkalemia, fluid overload)
3. **Avoid nephrotoxic agents**

Prognosis

- Reversible mostly.
- Recovery phases: **Initiation → Maintenance → Recovery**

AKI= An abrupt decline in renal function defined by:

- an increase in serum creatinine > 26.5 umol/l within 48hours or
- 1.9 times baseline known or presumed in the last 7 days.

OR

- a decrease in urine output to < 0.5ml / kg / hour for 6 hours or < 300mls in 12 hours.

ADEQUATE URINE IS 0.5ml/kg

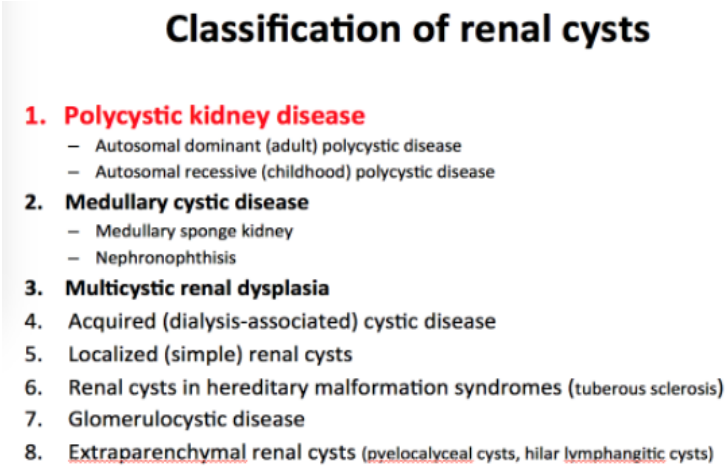
GLOMERULAR DISEASES:

Disease	Key Features	Pathogenesis	High-Yield Robbins Points	Tricky MCQ Points
Minimal Change Disease (MCD)	- Most common cause of nephrotic syndrome in **children**. - Sudden onset of proteinuria. - **Responds well to steroids**.	- Immune-mediated injury to podocytes. - Loss of foot processes → selective proteinuria (albumin).	- LM: Normal. - IF: Negative. - EM: Diffuse effacement of foot processes. - Associated with **Hodgkin lymphoma**, NSAIDs.	CHILDREN AND STEROIDS
Focal Segmental Glomerulosclerosis (FSGS)	- Nephrotic syndrome, often **steroid-resistant**. - **Segmental** sclerosis and hyalinosis. - Common in **adults**.	- Primary: Idiopathic. - Secondary: HIV, heroin use, obesity, sickle cell anemia.	- LM: Segmental sclerosis. - IF: Negative or nonspecific IgM and C3. - EM: Podocyte foot process effacement. - Can progress to ESRD.	SEGMENTAL, ADULTS
Membranous Nephropathy	- Common cause of nephrotic syndrome in adults. - Associated with cancer, HBV, SLE, drugs (NSAIDs, penicillamine).	- Immune complex deposition (**anti-PLA2R antibodies** in primary disease).	- LM: Diffuse capillary wall thickening. - IF: Granular deposits of IgG and C3. - EM: Subepithelial immune complex deposits (spike and dome).	- Anti-PLA2R antibody - Shows "**spike and dome**" on EM.
Membranoproliferative GN (MPGN)	- Mixed **nephrotic-nephritic** syndrome.	- Type I: Immune complex mediated. - Type II (**C3 glomerulopathy**) Alternative complement pathway dysregulation.	- LM: **Tram-track appearance** (GBM splitting). - IF: Type I: C3 and **IgG**. Type II: Dense deposits in GBM.	- Type I associated with HBV/HCV infection. - **Tram-track splitting** -T11 aka dense deposit disease
C3 Glomerulopathy	- Persistent activation of the **alternative complement pathway**. - Associated with dense deposit disease.	- Abnormalities in complement regulation (e.g., mutations in complement factor H).	- LM: Similar to MPGN. - IF: **Bright C3 deposits** without IgG. - EM: Dense intramembranous deposits.	- Strong link with complement factor H mutations.
IgA Nephropathy (Berger's Disease)	- **Most common** glomerular disease worldwide. - **Recurrent hematuria**, usually **following mucosal**	- Deposition of IgA in the mesangium. - Linked to abnormal IgA glycosylation.	- LM: Mesangial hypercellularity. - IF: IgA and C3 deposits in the mesangium.	- **Synpharyngitic hematuria** (occurs concurrently with infections). - Does not cause nephrotic syndrome.

	infections (e.g., URTI).		- EM: Electron-dense mesangial deposits.	- Often progresses to chronic kidney disease (CKD).
Rapidly Progressive GN (RPGN)	- Severe nephritic syndrome with rapid decline in GFR. - **Crescent formation** on biopsy.	- Type I: Anti-GBM (e.g., Goodpasture syndrome). - Type II: Immune complex (e.g., lupus nephritis). - Type III: Pauci-immune (ANCA-associated).	- LM: Crescents (proliferation of parietal cells and fibrin). - IF: Linear (Type I), granular (Type II), or negative (Type III).	- Type I linked to Goodpasture syndrome (anti-GBM antibodies target the alpha-3 chain of type IV collagen). - ANCA-associated RPGN lacks immune deposits.
Hereditary Nephritis	- Includes **Alport syndrome** and thin basement membrane disease. - Hematuria, hearing loss, and ocular abnormalities.	- Mutations in type IV collagen (COL4A3, COL4A4, COL4A5).	- Alport: GBM splitting and basket-weave pattern. - Thin basement membrane disease: Uniform thinning of GBM.	- Alport syndrome has a basket-weave pattern on EM. - Thin basement membrane disease causes benign familial hematuria.

Alport Syndrome: X-linked disorder causing **glomerulonephritis, sensorineural hearing loss, and ocular abnormalities** due to defective **type IV collagen**.

Cystic kidney diseases: CYSTS Develop from **renal tubule segments**



Inherited = involve **Autosomal Dominant (ADPKD)-ADULTS and Autosomal Recessive (ARPKD)-CHILDREN**

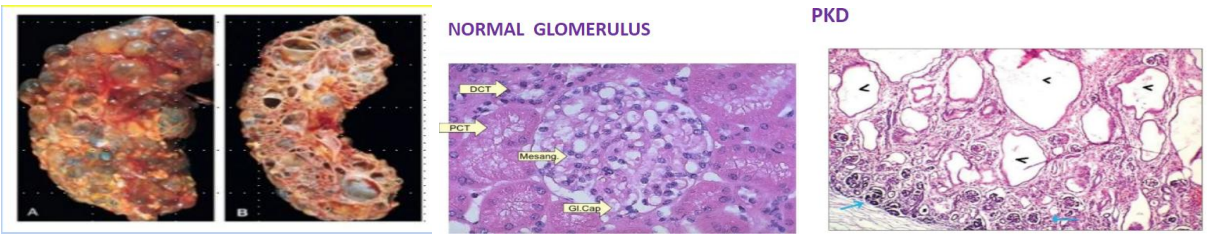
ADPKD= bilateral renal cysts, multisystem (liver, pancreas, arachnoid membrane cysts), mutations **PKD1** (80-85%) and **PKD2** (10-15%)

- PKD1 (chr 16p) encodes for →**POLYCYSTIN-1** (in tubular epithelial cells esp distil nephrons), cell-cell and cell-matrix interaction

- PKD2 (chr 4q) encodes for → **POLYCYSTIN-2** (functions as a Ca2+ permeable cation channel.)

➢ Polycystin 1 and 2 form a protein complex that **regulates intracellular calcium (Ca^{2+})** in response to fluid flow.

ARPKD= mutations in **PKHD1**



RFTS

Test	Significance
Serum Creatinine	↑= AKI or CKD
GFR	↓= CKD risk
BUN	↑= Kidney dysfunction (check with creatinine, urine protein, hydration)
Urine Protein & Microalbumin	Protein = Kidney damage; **Microalbumin** = Early kidney stress (diabetes, HTN)
Electrolytes (K^+, Na^+, Ca^{2+}, Phosphate)	Imbalance → Arrhythmias, hyperkalemia, late-stage CKD (↑ Phosphate)
Acid-Base (Bicarbonate)	↓ Metabolic acidosis in CKD

Causes of Protein Loss in Urine

1. **Glomerular Damage** – Nephrotic Syndrome, Glomerulonephritis
2. **Tubular Damage** – Tubular disorders (e.g., acute tubular necrosis)
3. **Overflow Proteinuria** – Multiple Myeloma (excess light chains)
4. **Post-Renal Causes** – Infections, tumors in urinary tract

Edema Causes

1. **Increased Hydrostatic Pressure** – Heart failure, DVT
2. **Decreased Oncotic Pressure** – Nephrotic syndrome, liver disease
3. **Increased Capillary Permeability** – Infection, burns, allergic reactions
4. **Lymphatic Obstruction** – Cancer, surgery, filariasis
5. **Sodium Retention** – Kidney disease, hyperaldosteronism

Renal Stones (Urolithiasis) - High-Yield Table

Type of Stone	Composition	Risk Factors	Appearance
Calcium Oxalate	Calcium oxalate	- Hypercalciuria (**most common**) - Hypocitraturia - Hyperoxaluria (e.g., excessive spinach, rhubarb) - Crohn's disease	Envelope/Dumbbell-shaped

Calcium Phosphate	Calcium phosphate	- **Alkaline urine** (pH > 7.5) - Renal tubular acidosis - Primary hyperparathyroidism	Wedge-shaped prisms
Struvite	Magnesium ammonium phosphate	- Urease-producing bacteria (Proteus, Klebsiella) - Recurrent UTIs	Coffin lid-shaped
Uric Acid	Uric acid	- **Acidic urine** (pH < 5.5) - Hyperuricemia (e.g., gout, high purine diet) - **Dehydration**	Rhomboid/Rosette-shaped
Cystine	Cystine	- Genetic defect in cystine reabsorption (autosomal recessive) - **Acidic urine**	Hexagonal-shaped

- **Radio-opaque:** Calcium oxalate, Calcium phosphate, Struvite, Cystine (faint).
- **Radiolucent:** Uric acid.

Malignant Hypertension

Definition: Severe, sudden rise in blood pressure **(>200/120 mmHg)** causing acute damage to the kidneys (malignant nephrosclerosis).

Pathogenesis

- Acute endothelial damage → fibrinoid necrosis.
- Platelet activation → ischemia and microvascular occlusion.
- RAAS activation worsens BP elevation.

Renal Neoplasms:

Renal Neoplasm	Key Features	Histology	High-Yield Points for MCQs
Renal Cell Carcinoma (RCC)			
Clear Cell RCC	- **Most common** (70-80%) renal cancer. - Originates from **proximal tubules.** - Associated with **VHL** mutation.	Clear cytoplasm due to lipid/glycogen accumulation.	- **VHL gene** mutation on chromosome **3p25.3**. - Often presents with **hematuria**, **flank pain**, and **palpable mass** ("classic triad").
	- Sporadic or hereditary forms. - Rich vascular network ("**chicken-wire" vessels**).		- Metastasis often to **lungs** (cannonball lesions) and bones. - Smoking, obesity, and male gender are risk factors.
Papillary RCC	- Second most common type. - Originates from **distal convoluted tubules**.	- Papillae with **foamy macrophages**. - **Psammoma bodies** may be seen.	- Associated with **dialysis-associated cystic disease**. - Trisomies **7 and 17**. - May show familial autosomal dominant inheritance.

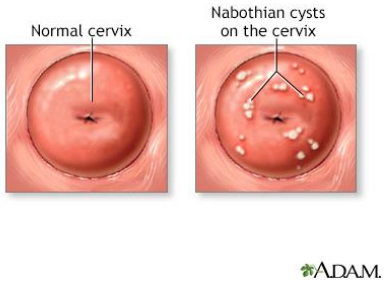
	- Associated with **MET gene** mutations.		
Chromophobe RCC	- Arises from **intercalated cells** of **collecting ducts**. - Better prognosis compared to other RCCs.	**Plant-like cell membranes**. - Perinuclear halos seen.	- Stains with **Hale's colloidal iron**. - Associated with **Birt-Hogg-Dube syndrome**.
Collecting Duct RCC (Bellini Duct)	- Rare and aggressive. - Originates from **medullary collecting ducts**.	Irregular nests of malignant cells in **desmoplastic stroma**.	- Associated with **sickle cell trait**. - Poor prognosis, rapid progression.
Renal Medullary Carcinoma	- Extremely rare. - Seen in young individuals with **sickle cell trait**. - Aggressive tumor.	Undifferentiated carcinoma with rhabdoid features.	- Exclusively associated with **sickle cell trait**. - Poor prognosis.
Benign Renal Tumors			
Renal Oncocytoma	- Benign tumor from **intercalated cells of collecting ducts**. - Presents as a **mahogany brown mass with a central scar**.	Large **eosinophilic cells**, lots of mitochondria.	- **Central stellate scar** characteristic. - Associated with **Birt-Hogg-Dube syndrome**. - Gross mimics RCC but benign.
Angiomyolipoma (AML)	- Hamartoma consisting of blood vessels, smooth muscle, and fat. - Associated with **tuberous sclerosis**.	Mixed tissue: fat, muscle, vessels.	- Seen in **tuberous sclerosis** (TSC1/TSC2 mutation on **chromosome 9 or 16**). - Risk of hemorrhage when > 4 cm.
Wilms Tumor (Nephroblastoma)			
Wilms Tumor	- **Most common renal tumor in children** (ages 2-5). - Presents as a large, palpable abdominal mass.	**Triphasic pattern**: epithelial (tubules), blastemal, stromal.	- Associated with **WT1/WT2 mutations**. - Syndromes: **WAGR** (Wilms, aniridia, genital anomalies, retardation), Beckwith-Wiedemann.
	- Can be part of syndromes: WAGR, Denys-Drash, Beckwith-Wiedemann.		- Risk of metastasis to lungs. - Presents with hematuria or hypertension in advanced cases.

Question= genes in renal neoplasms

RCC

REPRO/ GYNAE

Nabothian cysts: **Nabothian Cyst:** Benign, mucus-filled cervical gland cyst due to **blocked endocervical glands**, commonly found on the cervix, asymptomatic, and requires no treatment.



"**Dating the Endometrium**" refers to the process of examining the histological features of the endometrium (the lining of the uterus) **to determine its phase in the menstrual cycle**

Used to assess

- Hormonal status,
- Document ovulation (After ovulation, the endometrium enters the **secretory phase**, characterized by **glandular secretion** and **stromal changes**, which can be confirmed microscopically.)
- Causes of endometrial bleeding
- Infertility.

NORMAL SHEDDING (UPPER HALF TO TWO-THIRDS, BASAL THIRD RETAINED)

This retained basal= PROLIFERATIVE PHASE → grows GLANDS and STROMA

SECRETORY PHASE →, glands are dilated, secretions are discharged into the gland lumens, glands have serrated or "**saw-toothed**" appearance)

Ovulation is confirmed by the presence of

- **basal vacuolation** (earliest signs of ovulation)
- **secretory exhaustion** (This leads to a "saw-toothed" or tortuous appearance), or

- **predecidual changes**, (This refers to the transformation of stromal cells, where they become larger and more eosinophilic (cytoplasmic staining), preparing the endometrium for potential implantation of a fertilized egg.)

Ovulation **cannot be confirmed during the proliferative phase (OCCURS BEFORE OVULATION) or in the late stages of shedding**, as these phases precede or follow the active secretory period of the menstrual cycle.

Causes of Abnormal Uterine Bleeding by Age Group:

Age Group	Causes
Prepuberty	Precocious puberty (hypothalamic, pituitary, or ovarian origin)
Adolescence	Anovulatory cycle, coagulation disorders
Reproductive age	Complications of pregnancy (abortion, trophoblastic disease, ectopic pregnancy)
	Organic lesions (leiomyoma, adenomyosis, polyps, endometrial hyperplasia, carcinoma)
	Anovulatory cycle
	Ovulatory dysfunctional bleeding (e.g., inadequate luteal phase)
Perimenopausal	Anovulatory cycle
	Irregular shedding
	Organic lesions (carcinoma, hyperplasia, polyps)

ANOVULATORY CYCLE: excessive and prolonged **estrogenic stimulation without the development of the progestational phase** that regularly follows ovulation.

Less commonly, lack of ovulation is the result of

(1) Endocrine disorder,
(2) Primary lesion of the ovary, such as a functioning ovarian tumor (granulose-theca cell tumors) or polycystic ovaries
(3) Generalized metabolic disturbance

Most common at menarche and the perimenopausal period.

ENDOMETRIAL CHANGES INDUCED BY ORAL CONTRACEPTIVES:

Oral contraceptives cause **thinning of the endometrial lining**, reducing glandular development and secretion, leading to a **less receptive endometrium** for implantation.

ENDOMETRIOSIS: Presence of endometrial glands or stroma in abnormal locations outside the uterus.

Sites, in descending order of frequency

- Ovaries;
- Uterine ligaments;
- Rectovaginal septum;
- Pelvic peritoneum;

- Laparotomy scars; and
- rarely in the umbilicus, vagina, vulva, or appendix.

Often causes **infertility, dysmenorrhea, pelvic pain**

ADENOMYOSIS: Presence of endometrial tissue in **myometrium**.

ENDOMETRIOSIS THEORIES:

There are three main theories explaining the **origin of dispersed endometriotic lesions**:

1. **Regurgitation/Implantation Theory**:

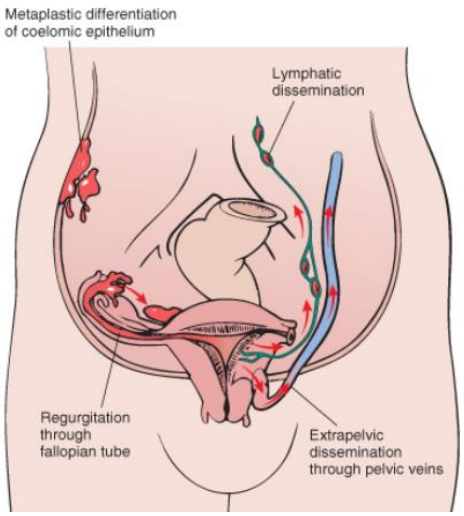
- **Mechanism**: This theory posits that **endometrial tissue can be pushed backward through the fallopian tubes into the peritoneal cavity during menstruation**. This backward flow is known as retrograde menstruation.
- **Evidence**: It is noted that retrograde menstruation can occur in many women without causing endometriosis, but it may **facilitate the spread of endometrial cells to other locations**.
- **Cervical Mucosa**: Endometriosis is often found in the cervical mucosa, especially after surgical procedures, supporting the idea that endometrial tissue can implant in locations above the uterus.

2. **Metaplastic Theory**:

- **Mechanism**: This theory suggests that endometrial tissue can develop directly from coelomic epithelium, which is the layer of cells that lines the body cavities. The müllerian ducts, which form during embryonic development, eventually develop into the uterus and endometrium.
- **Implication:** It implies that **some women may have a predisposition to develop endometriosis if their coelomic epithelium differentiates into endometrial tissue inappropriately.**

3. **Vascular or Lymphatic Dissemination Theory:**

- **Mechanism:** According to this theory, **endometrial cells can spread through the vascular system (veins) or lymphatic system, allowing them to reach distant sites such as the lungs or lymph nodes.**
- **Evidence**: This theory helps explain why endometriotic lesions can be found in areas not directly connected to the pelvic cavity, which is not easily explained by the first two theories.



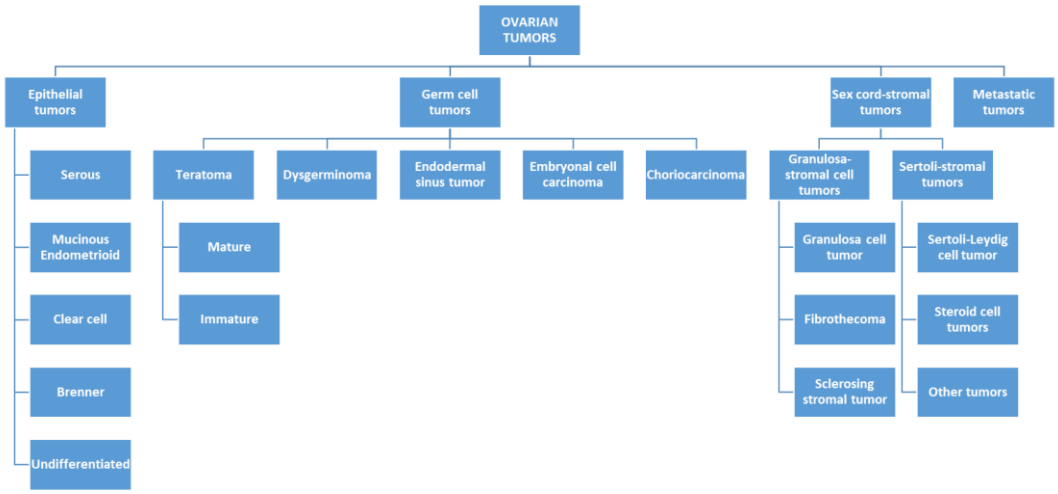
MORPHOLOGY OF ENDOMETRIOSIS:

- **Nodules:** Red-blue to yellow-brown appearance on or beneath serosal surfaces at the site of involvement.
- **Extensive Disease**: Organizing hemorrhage can lead to extensive fibrous **adhesions** between tubes, ovaries, and other structures. May cause obliteration of the pouch of Douglas, complicating diagnosis in long-standing cases.
- **Histologic Diagnosis**: Confirmed by the presence of endometrial stroma or, in its absence, müllerian epithelium with subjacent hemosiderin pigment.
- **Ovarian Changes**: Ovaries may show large cystic masses (3 to 5 cm) filled with brown blood debris, known as "**chocolate cysts**."

Indications for Endometrial Biopsy:

- Abnormal uterine bleeding (e.g., postmenopausal bleeding, heavy menstrual bleeding)
- Suspected endometrial hyperplasia or carcinoma
- Evaluation of infertility or recurrent pregnancy loss
- Monitoring of hormone therapy effects
- Suspicion of endometrial infection or tuberculosis

COMMON OVARIAN TUMORS



Ovarian Tumors

Ovary has 3 cell types: surface epithelium, germ cells, stroma.

1. Surface Epithelial Tumors

These tumors arise from the epithelial lining of the ovary, and they can be benign, borderline, or malignant. **MC OVARIAN TUMORS 70%**

Tumor Type	Benign	Malignant	Features
Serous Tumors	Serous Cystadenoma	Serous Cystadenocarcinoma	**Most common ovarian tumor**. Frequently bilateral, often cystic. **Psammoma bodies** in malignant type.
Mucinous Tumors	Mucinous Cystadenoma	Mucinous Cystadenocarcinoma	**Multiloculated, filled with mucin**. Rarely bilateral. **Pseudomyxoma peritonei** in malignant form.

Endometrioid Tumor	Endometrioid Cystadenoma	Endometrioid Carcinoma	Associated with **endometriosis**. Malignant form has solid areas and **glandular structures**.
Brenner Tumor	Brenner Tumor	Rarely malignant	**Urothelial-like epithelium** with **coffee-bean nuclei**. Benign but may rarely become malignant.

Markers

- **CA-125** is elevated in malignant surface epithelial tumors and is useful for monitoring therapy and recurrence.
- **ASS W/ BRCA1 MUATIONS**
- **Prophylactic salpingo-oophorectomy.**

2. Germ Cell Tumors

These tumors arise from the reproductive cells of the ovary, most commonly seen in younger women.

1. Fetal tissue (cystic teratoma and embryonal CA)
2. Oocytes (dysgerminoma)
3. Yolk sac (endodermal sinus tumor)
4. Placental tissue (choriocarcinoma)

Type	Key Features	Pathogenesis	Clinical Presentation	Notes	Histo
Cystic Teratoma (dermoid cyst)	Tumor with tissues from **all three germ layers.**	Arises from totipotent germ cells.	Mass effect, pain; may contain hair, teeth, or skin.	Mature (benign) or immature (malignant). **Struma ovarii: teratoma** with functional thyroid tissue.	**Contains elements from all three germ layers** (skin, hair, teeth, etc.). Most common in young women.
Dysgerminoma	Large cells with clear cytoplasm ("fried egg").	Most common malignant germ cell tumor.	Abdominal mass, pain, increased LDH.	Good prognosis; responsive to radiotherapy.	**Large cells** with **clear cytoplasm** and **central nuclei** ("fried egg appearance"). Produces **LDH**.
Yolk Sac Tumor	Schiller-Duval bodies (glomerulus-like structures).	Secretes alpha-fetoprotein (AFP).	Rapidly growing pelvic mass, pain.	Aggressive but responds well to chemotherapy.	**Schiller-Duval bodies** (glomeruloid structures) in histology. **AFP** is a marker
Choriocarcinoma	Malignant tumor of trophoblastic tissue.	Secretes hCG; arises from germ cells or following pregnancy.	Amenorrhea, elevated hCG, hemorrhagic mass.	Poor response to chemotherapy if germ cell origin.	Trophoblastic cells, produces hCG, very aggressive, hematogenous spread.

3. Sex Cord-Stromal Tumors

These tumors arise from the supportive tissue of the ovary and often secrete hormones.

Tumor Type	Benign	Malignant	Key Features
Granulosa-Theca Cell Tumor	Benign, often **estrogen-producing**	Malignant (rare)	**Call-Exner bodies** (small, follicle-like structures). **Estrogenic effects** can lead to **endometrial hyperplasia**.
Sertoli-Leydig Cell Tumor	Benign, may produce **androgens**	Malignant (rare)	Contains **Reinke crystals**. **Virilization** in patients due to androgen production.
Fibroma	Benign	Malignant (very rare)	Associated with **Meigs Syndrome** (fibroma, ascites, pleural effusion). **No hormone production**.

4. Metastatic Tumors

These tumors arise from other primary malignancies that spread to the ovaries.

Tumor Type	Origin	Key Features
Krukenberg Tumor	**Gastric carcinoma**	**Bilateral ovarian metastases**, mucin-producing **signet ring cells**. Typically, **poor prognosis**.
Pseudomyxoma Peritonei	**Appendix**, **mucinous ovarian tumor**	**Mucinous ascites**; associated with **mucin-producing tumors** in the appendix or ovary.

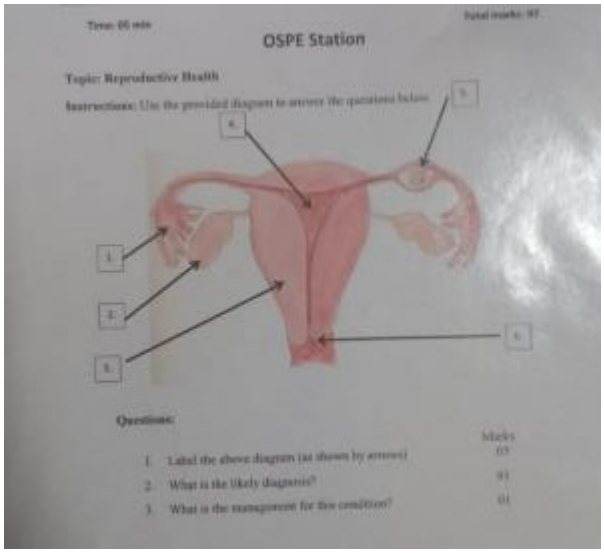
Tumor Markers

Marker	Associated Tumor	Clinical Use
CA-125	Surface epithelial tumors (Serous, Mucinous)	Monitor for recurrence in malignant tumors.
AFP	Yolk Sac Tumor, Embryonal Carcinoma	Diagnostic, also used to monitor recurrence.
hCG	Choriocarcinoma, Dysgerminoma	Diagnostic and monitoring, especially in choriocarcinoma.
LDH	Dysgerminoma	Diagnostic, elevated in dysgerminomas and certain other germ cell tumors.

Hydatidiform Mole

1. **Definition:** Abnormal conception with swollen and edematous villi, forming a mass resembling **grape clusters.**
2. **Types:**
    - **Complete Mole:**
        - **Karyotype: 46,XX or 46,XY** (all paternal DNA).
        - **No** fetal tissue.
        - High **β-hCG**.
        - **Increased risk of choriocarcinoma**.
    - **Partial Mole:**
        - **Karyotype: 69,XXX / 69,XXY.**
        - **Fetal** tissue present.
        - Mild β-hCG elevation.
        - **Lower risk** of malignancy.
3. **Clinical Presentation:**
    - Vaginal bleeding.
    - Uterus larger than expected for gestational age.
    - **Hyperemesis gravidarum**.
    - **Passage of grape-like tissue** per vagina.
4. **Diagnosis:**
    - **Ultrasound: Snowstorm pattern**, absence of fetus in complete mole.
    - **β-hCG:** Significantly elevated.
5. **Treatment:**
    - **D&C (dilation and curettage)**.
    - Weekly β-hCG monitoring until it normalizes.
    - **Methotrexate** for persistent disease or choriocarcinoma.

Vulvovaginitis : Redness of the vulva. Vulvar and/or vaginal itching. Vaginal discharge or bleeding. Stinging or burning sensations.



Labels:

1. Fallopian Tube
2. Ovary
3. Uterus
4. Cervix
5. Vagina

Answers to Questions:

1. **Most Diagnosed Condition**: Ectopic Pregnancy (common site: fallopian tube)
2. **Management**:
    - **Medical**: Methotrexate (if stable and unruptured)
    - **Surgical**: Salpingectomy or salpingostomy (if ruptured or unstable

1. **Pap smear test**
2. **Risk factors for cervical cancer**

- HPV infection
- Smoking
- Having a weakened immune system
- Oral contraceptives
- Having HIV
- Age
- Diethylstilboestrol
- Obesity
- Sexual active women
- Multiple Sexual partners
- Family history of cervical cancer
- Multiple pregnancies
- sexually transmitted infections (Chlamydia infection)
- Family history

3. **HPV**
4. **Adequacy of pap smear?**
    - **Presence of an Adequate Number of Squamous Cells**
    - **Adequate Endocervical/T-Zone Component**: Presence of **endocervical cells or metaplastic cells from the transformation zone**, indicating the sample was taken from the correct area of the cervix.
    - Proper Fixation and Staining: The sample must be well-fixed and properly stained to avoid obscuring the cells, ensuring accurate assessment.
    - **Absence of Obscuring Factors**: The sample should be free **from blood, mucus, or inflammation** that might obscure the cellular details, although some degree of these is acceptable.
    - **Satisfactory Specimen Volume**: The quantity of cells should be enough to ensure a representative sample, neither too scant nor too dense
    - Pap smear specimen should be obtained 2 weeks after the first day of LMP taken by BRUSHING or SCRAPING
5. **Name the Spatula used AYRES SPATULA**

Gonorrhea, also known as "the clap," is a sexually transmitted infection caused by a bacterium called **Neisseria gonorrhoeae**. It can be passed from person to person **through sexual contact**, including vaginal, anal, or oral sex. Symptoms may include pain or burning during urination, abnormal discharge from the genitals

Vacuum or suction aspiration is a procedure that uses a vacuum source to remove an embryo or fetus through the cervix. The procedure is performed to **induce abortion**, as a **treatment for incomplete spontaneous abortio**n or **retained fetal and placental tissue**, or to obtain a **sample** of uterine lining.

Triple negative breast cancer is a subtype of breast cancer that lacks three specific receptors: estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor 2 (HER2). This means that the cancer cells do not have these receptors, which are typically targeted by certain treatments.—MOST AGGRESIVE

A significant **urinary tract infection (UTI)** is defined by the presence of **>105 colony-forming units (CFU)** of a single organism in a properly collected urine sample

How OCPs Work (GYNAE STATION)

Mechanism of Action:

1. **Inhibit Ovulation**: Suppress LH and FSH secretion, preventing the LH surge.
2. **Thicken Cervical Mucus**: Blocks sperm entry.
3. **Alter Endometrium**: Makes it unfavorable for implantation.

If you want it even shorter:
"OCPs prevent ovulation, thicken cervical mucus, and alter the endometrium to prevent pregnancy."

Types of OCPs

1. **Combined Oral Contraceptive Pills (COCs)** – Contain both **estrogen and progestin**
    - **Monophasic**: Same hormone dose throughout the cycle
    - **Biphasic/Triphasic**: Varying hormone doses to mimic the natural cycle
2. **Progestin-Only Pills (POPs)** – Only progestin (used for breastfeeding women or those with estrogen contraindications)

Patterns of OCPs

1. **21-day regimen**: 21 active pills + 7 pill-free days
2. **24/4 regimen**: 24 active pills + 4 placebo pills
3. **Extended-cycle pills**: 84 active pills + 7 placebo pills (period every 3 months)

Missed Pills Protocol

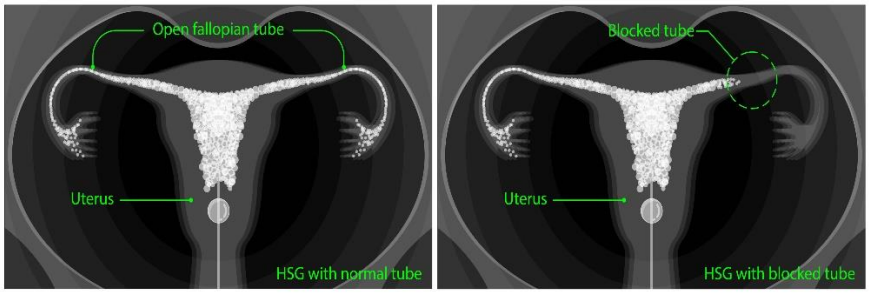
For Combined Pills:

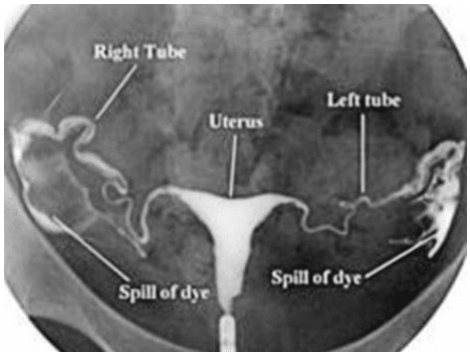
- **1 missed pill:** Take it as soon as you remember; continue the rest as usual. No backup needed.
- **2+ missed pills:** Take the most recent missed pill, skip the others, and use backup contraception for 7 days.

For Progestin-Only Pills:

- **>3 hours late:** Take the pill immediately and use backup contraception for 48 hours.

HYSTOSALPINGOGRAM





Hysterosalpingogram (HSG)

- **What it is**: X-ray procedure to evaluate the **uterus** and **fallopian tubes**.
- **Purpose**: Check for causes of infertility, like tubal blockages or uterine abnormalities.
- **Procedure**: Contrast dye is injected into the uterus and fallopian tubes, followed by X-ray imaging.
- **Findings**:
  - Normal: Free spill of dye into the peritoneal cavity.
  - Abnormal: Blockage, adhesions, or uterine anomalies.
- **Complications**: Pain, infection, or allergic reaction to contrast dye.

Short OSPE answer:
"HSG evaluates uterine and tubal patency using X-rays and contrast dye, commonly used for infertility assessment."

Ectopic Pregnancy (High-Yield Points)

- **Most Common Site**: Ampulla of the fallopian tube.
- **Classic Triad**: Abdominal pain, amenorrhea, vaginal bleeding.
- **Diagnosis**: β-hCG not doubling every 48 hours + empty uterus on ultrasound.
- **Risk Factors**: PID, tubal surgery, IUD, smoking, IVF.
- **Complication**: Rupture → hemoperitoneum, shock.
- **Treatment**:
  - **Methotrexate** for stable, early cases.
  - **Surgical**: Laparoscopy if unstable or ruptured.

POLYCYSTIC OVARIAN SYNDROME

Diagnostic Criteria	**Rotterdam Criteria** (2 of 3 required): 1. Oligo- or anovulation. 2. Clinical/biochemical hyperandrogenism. 3. Polycystic ovarian morphology on ultrasound: **≥12 follicles <10 mm, increased stroma.**

Investigations	- **TVUSS**: Assess polycystic morphology. - **Serum Hormones**: - Elevated **LH:FSH ratio (>2:1)**. - Testosterone and DHEAS (to rule out other causes). - Fasting glucose/insulin ratio for insulin resistance.

ENDO

Difference between Cushing disease and Cushing syndrome?

- **Cushing syndrome** refers to a group of symptoms caused by high levels of cortisol in the body, **regardless of the cause**. On the other hand,
- **Cushing disease** specifically refers to a form of Cushing syndrome **caused by a pituitary gland tumor** that produces excessive amounts of

The dexamethasone suppression test typically lowers cortisol levels in cases of pituitary adenomas, but not in adrenal tumors or ectopic ACTH production

Diagnostic Tests for Cushing's Syndrome and Addison's Disease

Cushing's Syndrome (Excess Cortisol)

1. **Initial Screening Tests:**
   - **24-hour urinary free cortisol** (elevated)
   - **Low-dose dexamethasone suppression test** (cortisol remains high)
   - **Late-night salivary cortisol** (elevated)
2. **Confirmatory Tests:**
   - **High-dose dexamethasone suppression test** (**differentiates pituitary from ectopic source**)
   - **ACTH levels** (low in adrenal tumors, high in ACTH-dependent causes)

Addison's Disease (Adrenal Insufficiency)

1. **ACTH Stimulation Test**: No cortisol rise in primary Addison's.
2. **Plasma ACTH**: Elevated in primary Addison's, low in secondary.
3. **Serum Cortisol**: Low morning cortisol (<3 mcg/dL) indicates Addison's.
4. **Electrolytes**: Low sodium, high potassium.

primary hyperaldosteronism is caused by an aldosterone secreting adenoma= CONN'S SYNDROME

CAUSES OF ADRENAL INSUFFICIENCY

Primary Adrenal Insufficiency (Addison's Disease)

- **Autoimmune destruction** (most common in developed countries)
- **Infections** (TB, HIV, fungal)
- **Adrenal hemorrhage** (Waterhouse-Friderichsen syndrome)
- **Metastases** (lung, breast cancer)
- **Congenital adrenal hyperplasia**

Secondary Adrenal Insufficiency (due to decreased ACTH)

- **Chronic glucocorticoid use** (most common)
- **Hypopituitarism** (tumors, trauma, Sheehan's syndrome)

Tertiary Adrenal Insufficiency (due to hypothalamic dysfunction)

- Sudden **withdrawal of prolonged glucocorticoid therapy**

Difference between adrenal insufficiency and adrenal crisis?

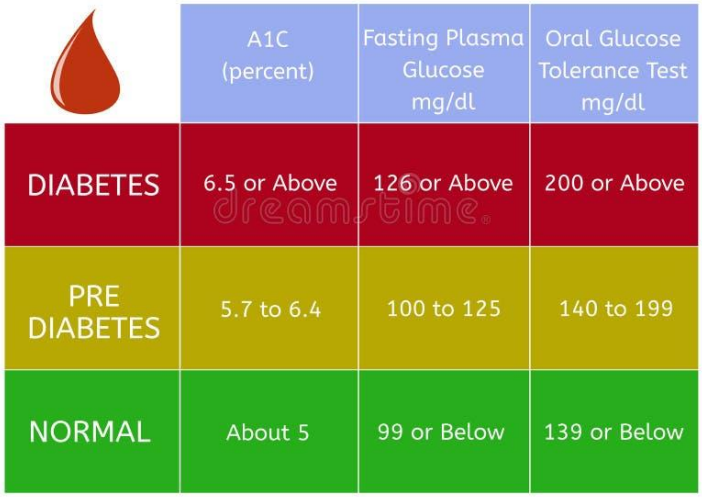
	Chronic Adrenal Insufficiency	**Adrenal Crisis (Acute Adrenal Insufficiency)**
Symptoms	Fatigue, anorexia, weight loss, myalgia, arthralgia Dizziness Nausea, vomiting, diarrhea Salt craving (in primary AI only)	Severe weakness Acute abdominal pain, nausea, vomiting Altered sensorium
Signs	Orthostatic hypotension Fever Hyperpigmentation of the skin creases and buccal mucosa (in primary AI only)	Hypotension Fever Abdominal tenderness or guarding Reduced consciousness
Biochemical	Hyponatremia Hyperkalemia (primary AI) Hypoglycemia Hypercalcemia Mild normocytic anemia, lymphocytosis, eosinophilia	Hyponatremia Hyperkalemia (primary AI) Hypoglycemia Hypercalcemia

1. **Adrenal Insufficiency**: This refers to a condition where the adrenal glands don't produce enough hormones, such as cortisol. It can be primary (caused by a problem with the adrenal glands themselves) or secondary (caused by a problem with the pituitary gland or hypothalamus). Symptoms can include fatigue, weakness, weight loss, and low blood pressure.

2. **Adrenal Crisis**: This is a severe form of adrenal insufficiency that occurs when there is a sudden and significant drop in cortisol levels. It is a medical emergency and can be life-threatening. Symptoms can include severe fatigue, abdominal pain, nausea, vomiting, low blood pressure, and even loss of consciousness.

DIABETES

BLOOD SUGAR TEST LEVELS



	A1C (percent)	Fasting Plasma Glucose mg/dl	Oral Glucose Tolerance Test mg/dl
DIABETES	6.5 or Above	126 or Above	200 or Above
PRE DIABETES	5.7 to 6.4	100 to 125	140 to 199
NORMAL	About 5	99 or Below	139 or Below

Any of these confirmed on **two separate occasions** is diagnostic of diabetes.

For OSPE: **"FPG ≥ 126 mg/dL or HbA1c ≥ 6.5% is the gold standard for diagnosis."**

Glycosylated hemoglobin (HbA1c): Best for monitoring long-term glucose control over 2-3 months

Types of Diabetes (Short Version)

1. **Type 1 Diabetes** – Autoimmune destruction of β-cells, insulin-dependent
2. **Type 2 Diabetes** – Insulin resistance with β-cell dysfunction
3. **Gestational Diabetes** – Diabetes during pregnancy
4. **Secondary Diabetes** – Due to conditions like pancreatitis, Cushing's syndrome, or medications (steroids)

Prediabetes is a serious health condition where blood sugar levels are higher than normal, but not high enough yet to be diagnosed as type 2 diabetes.

100 to 125 mg/dL indicates you have prediabetes,

common complications associated with diabetes:

1. **Microvascular Complications**:
   - **Retinopathy** (leading cause of blindness in adults)
   - **Nephropathy** (leading to chronic kidney disease)
   - **Neuropathy** (autonomic and peripheral)
2. **Macrovascular Complications**:
   - **Coronary artery disease (CAD)**
   - **Cerebrovascular disease**
   - **Peripheral vascular disease (PVD)**

3. **Infections**:
    - Increased risk of skin, urinary tract, and respiratory infections.
4. **Diabetic Foot**:
    - Due to neuropathy and poor circulation, leading to ulcers and infections.
5. **Diabetic Ketoacidosis (DKA)**:
    - Acute, life-threatening complication in Type 1 diabetes due to insulin deficiency.
6. **Hyperosmolar Hyperglycemic State (HHS)**:
    - More common in Type 2 diabetes, characterized by severe hyperglycemia, dehydration, and altered mental status.
7. **Atherosclerosis**:
    - Accelerated in diabetes, contributing to cardiovascular disease.
8. **Cataracts**:
    - Due to sorbitol accumulation in lens of the eye.

In type 2 diabetes, also known as non-insulin-dependent diabetes mellitus (NIDDM), there are a few **key defects** that contribute to the development of the condition:

1. **Insulin Resistance**
2. **Beta-cell Dysfunction**

Developmental Causes of Diabetes

1. **Genetic Mutations and Syndromes**
2. **Congenital Pancreatic Anomalies**
3. **Maternal Factors during Development**

Diabetic Foot Examination (High-Yield Points)

1. **History**
    - Foot pain, numbness, tingling
    - History of ulcers, infections, or previous amputations
2. **Inspection**
    - **Skin:** Color changes, cracks, ulcers, infections
    - **Deformities:** Charcot foot, claw toes, bunions
    - **Nails:** Fungal infections, ingrown toenails
    - **Footwear:** Check for improper fit or wear patterns
3. **Palpation**
    - **Temperature:** Coolness may indicate ischemia
    - **Pulses:** Dorsalis pedis and posterior tibial arteries
    - **Capillary Refill:** Normal <2 seconds
4. **Sensory Examination**
    - **Monofilament Test:** 10g monofilament at specific sites
    - **Vibration:** Tuning fork (128 Hz) at bony prominences
    - **Proprioception:** Position sense in toes
    - **Pinprick and Light Touch:** Assess peripheral neuropathy
5. **Reflexes**
    - Ankle reflex (may be absent in diabetic neuropathy)
6. **Special Tests**
    - **Ankle-Brachial Index (ABI):** To assess peripheral arterial disease

- **Ulcer Assessment:** Size, depth, base (necrotic tissue or granulation), discharge

Documentation:

Include sensory loss, presence of ulcers, and vascular status.

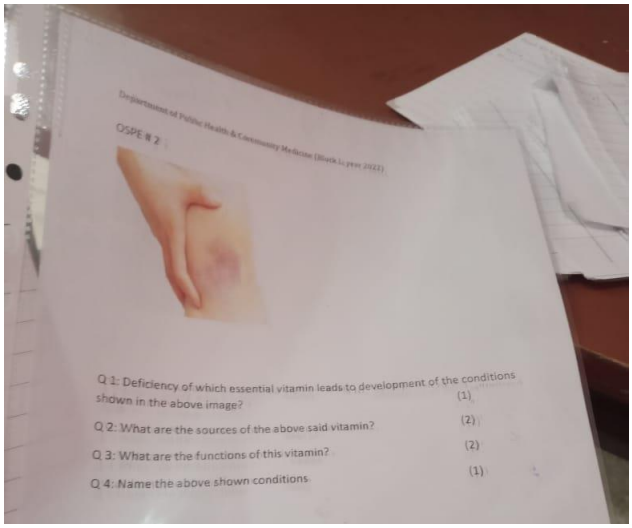
LIST OF CAUSES OF SECONDARY HYPERPARATHYROIDISM:

1. **Chronic kidney disease**: When the kidneys are unable to maintain the balance of calcium and phosphorus in the body, it can lead to an overproduction of parathyroid hormone.

2. **Vitamin D deficiency**: Insufficient levels of vitamin D can disrupt the body's ability to absorb calcium, leading to secondary hyperparathyroidism.

3. **Malabsorption disorders**: Certain conditions that affect the absorption of nutrients, such as celiac disease or inflammatory bowel disease, can contribute to secondary hyperparathyroidism.

4. **Calcium and vitamin D supplementation**: Excessive intake of calcium or vitamin D supplements without proper monitoring can disrupt the balance of parathyroid hormone in the body.



⍰ Deficiency of which essential vitamin leads to the development of the condition shown in the image?

- **Vitamin D**

⍰ What are the sources of the above-said vitamin?

- **Sunlight**, **fortified dairy products**, **fish liver oils**, **egg yolk**

⍰ What are the functions of this vitamin?

- **Calcium and phosphorus absorption**
- **Bone mineralization**
- **Prevention of rickets and osteomalacia**

 Name the above-shown condition.

- **Rickets** (in children) or **Genu valgum (knock knees)** due to Vitamin D deficiency

Thyrotoxicosis vs. Hyperthyroidism

Feature	Thyrotoxicosis	Hyperthyroidism
Definition	Clinical syndrome due to excess thyroid hormone in blood	Subtype of thyrotoxicosis caused by overactive thyroid gland
Causes	Any cause of elevated thyroid hormones (e.g., hyperthyroidism, thyroiditis, exogenous hormone intake)	Mainly Graves' disease, toxic multinodular goiter, toxic adenoma
Thyroid Gland	May or may not be overactive	Always overactive
T3/T4 Levels	Elevated	Elevated
TSH Levels	Low (except in TSH-secreting tumor)	Low
Symptoms	Weight loss, heat intolerance, tachycardia, tremors, palpitations	Same as thyrotoxicosis but typically more chronic
Treatment	Depends on the cause (antithyroid drugs, beta-blockers, iodine therapy)	Antithyroid medications, radioactive iodine, surgery

In short:

- **Hyperthyroidism** is one cause of **thyrotoxicosis**.
- **Thyrotoxicosis** is a broader term that includes all conditions with excess thyroid hormone, even if the thyroid gland isn't overactive (e.g., exogenous intake or thyroiditis).

In hyperthyroidism, you would typically expect:

- Increased levels of thyroid hormones (T3 and T4).
- Suppressed TSH due to negative feedback from high levels of thyroid hormones.
- CATECHOLAMINES INCREASED
- IODINE UPTAKE INCREASED

Hyperthyroidism:

- **Findings**: Tachycardia, tremors, heat intolerance, exophthalmos (in Graves' disease)
- **Symptoms**: Weight loss, increased appetite, anxiety, irritability, diarrhea, sweating
- **Labs**: Low TSH, high T3/T4, low cholesterol
- **Causes**: Graves' disease, toxic multinodular goiter, thyroiditis, excess iodine
- **Treatment**: Antithyroid drugs (methimazole, PTU), radioactive iodine therapy, surgery

Primary Hypothyroidism:

- **Findings**: Deep voice, bradycardia, delayed Achilles' reflex
- **Symptoms**: Weight gain, fatigue, cold intolerance, constipation, slow speech, memory loss

- **Labs**: High TSH, low T4, hypercholesterolemia
- **Causes**: Hashimoto's thyroiditis, radioactive iodine, thyroidectomy, radiotherapy
- **Treatment**: Levothyroxine (T4) replacement

Secondary Hypothyroidism:

- **Labs**: Low/normal TSH, low T3/T4
- **Causes**: Pituitary tumor, infarction, sarcoidosis, infiltrative diseases

Hyperthyroidism & Thyrotoxicosis

Diagnosis:

- **Thyroid function tests (TFTs)**: Low or undetectable TSH, elevated free T4/T3.
- **Clinical features**: Tachycardia, weight loss, heat intolerance, tremor, and goiter (depending on the subtype).

Management:

- **Beta-blockers** for symptomatic relief (e.g., propranolol).
- **Antithyroid drugs (ATDs)**: Methimazole or propylthiouracil (PTU) for reducing thyroid hormone synthesis.
- **Definitive therapy**: Radioactive iodine ablation (RAIA) or thyroid surgery in cases of toxic multinodular goiter or failure to control hyperthyroidism.

Graves' Disease

Diagnosis:

- **TFTs**: Low TSH, high T4/T3.
- **Specific test**: Thyroid receptor antibodies (TRAb).
- **Imaging**: Thyroid ultrasound or, if not pregnant, radioactive iodine uptake (RAIU) test.

Management:

- **Antithyroid drugs**: Methimazole or PTU.
- **Symptom management**: Beta-blockers.
- **Definitive therapy**: RAIA or thyroidectomy if severe

Thyroid Storm (Severe Hyperthyroidism)

Diagnosis:

- A life-threatening exacerbation of hyperthyroidism.
- **Clinical features**: High fever, tachycardia (>140/min), atrial fibrillation, hypotension, delirium, and shock.
- Diagnosed based on clinical presentation and TFTs.

Management:

- **ICU admission** and aggressive treatment.
- **Beta-blockers** (propranolol) and **antithyroid drugs** (PTU preferred).
- **Iodine solutions** to inhibit thyroid hormone release.
- **Glucocorticoids** to reduce T4 to T3 conversion

Exogenous Thyrotoxicosis

Diagnosis:

- Caused by excessive intake of thyroid hormone.
- **TFTs**: Low TSH, high T4/T3, low thyroglobulin (Tg), and low RAI uptake.
- **Clinical features**: Absence of goiter.

Management:

- Stop exogenous thyroid hormone.
- Consider beta-blockers for symptom control.

Hashimoto's Thyroiditis

Diagnosis:

- Signs of hypothyroidism or thyrotoxicosis (less common).
- **Lab tests**: Elevated TSH, low T4, positive TPO antibodies.
- **Additional investigations**: Thyroid ultrasound may show diffuse hypoechogenicity.

Management:

- **Overt hypothyroidism**: Lifelong levothyroxine replacement.
- **Subclinical hypothyroidism**: Consider low-dose levothyroxine based on patient profile.
- **Goiter**: Consider thyroidectomy for obstructive symptoms

Subacute Thyroiditis (De Quervain's and Lymphocytic Thyroiditis)

Diagnosis:

- **Granulomatous thyroiditis**: Painful goiter, preceded by a viral infection.
- **Lymphocytic thyroiditis**: Painless goiter, commonly postpartum or drug-induced.
- Lab findings: Hyperthyroid phase followed by hypothyroid phase.

Management:

- **Beta-blockers** for symptomatic thyrotoxicosis.
- Levothyroxine for hypothyroidism.
- Monitor thyroid function every 4–8 weeks until euthyroid.

(**Reactive Thyroiditis**

- **Cause**: Post-viral inflammation (e.g., subacute thyroiditis)
- **Symptoms**: Painful thyroid, fever, fatigue, transient hyperthyroidism → hypothyroidism → recovery
- **Diagnosis**: ↑ ESR, ↓ TSH (initially), normal antibodies
- **Treatment**: NSAIDs, beta-blockers, steroids (if severe)**)**

Struma Ovarii

- Rare ovarian teratoma with **thyroid tissue** (>50%)
- Can cause **hyperthyroidism**
- Symptoms: Abdominal mass, pain, menstrual issues, signs of hyperthyroidism
- Diagnosis: Ultrasound, thyroid function tests, histopathology
- Treatment: Surgery; radioactive iodine if malignant or functional

Thyroid Cancer

Diagnosis:

- Initial evaluation with TSH, thyroid ultrasound, and fine-needle aspiration (FNA) of suspicious nodules.
- Tumor markers for specific cancers:
  - **Thyroglobulin** for differentiated thyroid cancer.
  - **Calcitonin** for medullary carcinoma.

Management:

- Total thyroidectomy followed by radioactive iodine therapy if indicated.
- Lifelong monitoring of tumor markers and imaging for recurrence or metastases.

Thyroid Examination for OSCE:

1. **Introduction**:
   - Wash hands, introduce yourself, and explain the procedure to the patient.
2. **Inspection**:
   - Ask the patient to sit comfortably and extend their neck slightly.
   - Look for any visible swelling, asymmetry, or obvious goiter at the neck level.
   - Observe the skin for signs of thyroid dysfunction (e.g., dry skin, exophthalmos).
3. **Palpation**:
   - Stand behind the patient. Place your hands on their neck.
   - Ask the patient to swallow water.
   - Feel for the **isthmus** (central part) and **lobes** of the thyroid on each side.
   - Palpate for any **lumps**, **nodules**, or **tenderness**.
   - Assess for **firmness** or **softness** of the thyroid tissue.
4. **Auscultation**:
   - Use your stethoscope to listen over the thyroid for a **bruit**, particularly in suspected hyperthyroidism (e.g., Graves' disease).
5. **Functional Tests** (optional in OSCE, if demonstrated):
   - Check for signs of **hyperthyroidism** (e.g., tremors, rapid pulse) or **hypothyroidism** (e.g., dry skin, slow reflexes).
6. **Conclusion**:
   - Summarize the findings, explain the next steps if necessary, and thank the patient.

Ovarian cancer biomarkers

- CA-125
- HE4
- BRCA1
- BRCA2

Types of Pituitary Adenomas

Classified based on **hormonal secretion** and **size**.

1. Hormone-secreting (Functional) Adenomas

- **Prolactinoma (Most common)**
  - ↑ Prolactin → Galactorrhea, amenorrhea, infertility
- **Somatotroph Adenoma (GH-secreting)**
  - Acromegaly (adults), gigantism (children)
- **Corticotroph Adenoma (ACTH-secreting)**
  - Cushing's disease (↑ Cortisol)
- **Thyrotroph Adenoma (TSH-secreting)**
  - Secondary hyperthyroidism (↑ T3, T4)
- **Gonadotroph Adenoma (FSH/LH-secreting)**
  - Often clinically silent, may cause hypogonadism or mass effect

2. Non-functional (Non-secreting) Adenomas

- Usually present with **mass effect** (headache, bitemporal hemianopia)

3. Based on Size

- **Microadenoma** (< 1 cm)
- **Macroadenoma** (≥ 1 cm)

Breast Examination (High-Yield Points)

1. **Inspection:**
   - Symmetry, size, and shape
   - Skin changes (dimpling, peau d'orange, redness)
   - Nipple changes (inversion, discharge)
2. **Palpation:**
   - **Position:** Sitting and lying down with arm raised
   - **Technique:** Use pads of fingers in circular motion
   - **Areas:** All quadrants, nipple-areola complex, axillary tail (Tail of Spence)
   - **Lymph nodes:** Axillary, supraclavicular, and infraclavicular
3. **Signs of Malignancy:**
   - Hard, fixed, irregular mass
   - Nipple retraction or discharge (bloody)
   - Skin ulceration or dimpling

Breast pathology:

Pathology	Key Features	Clinical Presentation	Risk/Associations
Acute Mastitis	Bacterial infection (Staph aureus)	Red, warm breast; purulent discharge	Breastfeeding (cracked nipples)
Periductal Mastitis	Squamous metaplasia of ducts	Subareolar mass with nipple retraction	Smoking
Mammary Duct Ectasia	Chronic inflammation, plasma cells	Green-brown discharge; postmenopausal	Rare, benign

Pathology	Key Features	Clinical Presentation	Risk/Associations
Fat Necrosis	Necrosis of fat due to trauma	Painless mass, calcifications on mammogram	History of trauma
Fibrocystic Change	Cystic, fibrosis, apocrine metaplasia	Lumpy breast, premenstrual pain	No increased cancer risk (most changes)
Intraductal Papilloma	Papillary growth in duct, fibrovascular core	Bloody nipple discharge	Pre-menopausal women
Fibroadenoma	Benign, stromal tumor	Mobile, well-circumscribed mass	Estrogen-sensitive
Phyllodes Tumor	Leaf-like projections, stromal tumor	Large, fast-growing mass	Can be malignant
DCIS (Ductal Carcinoma In Situ)	Malignant cells in ducts, no invasion	Detected on mammogram (microcalcifications)	Comedo subtype: high-grade, necrosis
Invasive Ductal Carcinoma	Firm, fibrous mass, duct-like structures	Rock-hard mass, dimpling of skin, nipple retraction	Most common type
Invasive Lobular Carcinoma	Single-file pattern (no E-cadherin)	Bilateral, multiple lesions	More common in older women
Paget Disease	DCIS involving skin of the nipple	Erythematous, ulcerated nipple	Underlying carcinoma
Inflammatory Carcinoma	Dermal lymphatic invasion	Peau d'orange (edema, thickened skin)	Poor prognosis

FORENSICS

Human Organ Transplantation Act (Pakistan)

- **Purpose**: Regulates organ donation and transplantation, prevents illegal trade.
- **Living Donor**: Only close relatives can donate organs.
- **Brain Death**: Organ donation allowed with family consent.
- **Approval**: Unrelated donors need ethical committee approval.
- **Punishment**: Up to 10 years jail and fines for illegal organ trade.
- **Authority**: Human Organ Transplant Authority (HOTA) oversees implementation.

PREGNANCY

Presumptive Signs

- Suppression of Menstruation
- Morning Sickness
- Sympathetic Disturbances
- Changes in the Breasts
- **Quickening**: Mother's subjective **sensation of movements of the fetus** and occurs at 4 to 4 & 1/2 month.
- Pigmentation of the skin
- Changes in Vagina: Due to increased vascularity and venous stasis due to pressure of gravid uterus after fourth month. The mucous membrane gradually changes from **pink to violet** and then

deepens to **blue** (**Chadwick's sign/ Jackquemier's sign)— Bluish discoloration of the cervix, vagina, and vulva.**

- Urinary Disturbances

Probable Signs

- Changes in the abdomen (Progressive enlargement, triae gravidarum / linea albicantes, Linea nigra, Everted umbilicus)
- **Softening of lower uterine segment** (At about the sixth week, the lower uterine segment becomes so soft and compressible that if one hand is placed on the abdomen just above the symphysis pubis and two fingers of the other hand are introduced in the posterior fornix, they can be felt touching each other as if there is no uterus in between. This is also known as **Hegar's sign**.)
- **Softening of the os** (Refers to softening of the cervix from below upwards from second month onwards due to increased vascularity (**Goodell's sign**).)
- Presence of cervical mucous plug
- Intermittent uterine contractions and relaxations (after 4th month, contraction=1minute, relaxation= 2-3 minutes, Referred to as **Braxton-Hick's sign**)
- **Ballottement** (This is a test to elicit the **presence of fetus floating in liquor amnii** from fourth to seventh month (best elicited during fourth and fifth months when the fetus is small compared to the amount of amniotic fluid). There are two methods to elicit this; External ballottement, Internal ballottement)
- **Uterine soufflé** (It is a **soft blowing murmur heard on either side of the uterus**, by auscultation just above the inguinal ligament, from about the fourth month onwards. It is **synchronous with maternal pulse** and is due to the passage of blood through dilated uterine vessels.)
- Biological tests/immunological tests

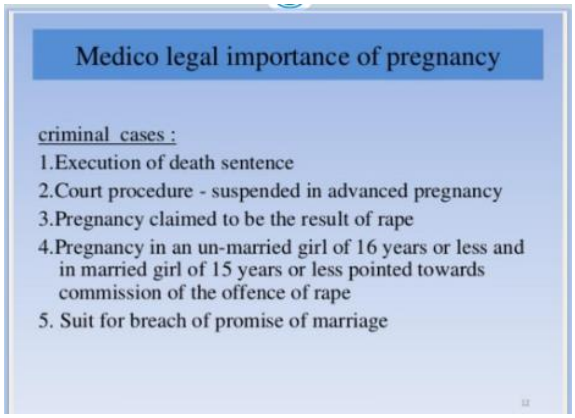
Conclusive Signs *Only signs to be relied upon. Diagnosis of pregnancy should be absolutely based on conclusive signs*

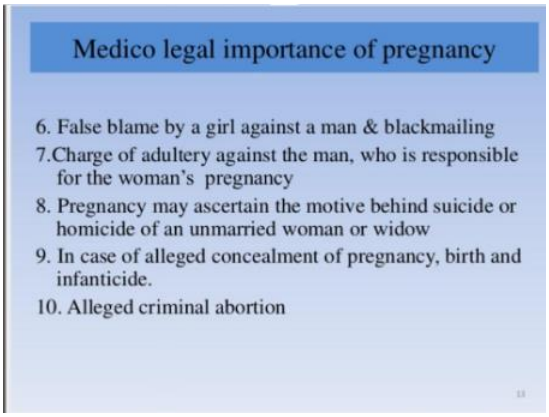
- Hearing of fetal **heart sounds** (other than maternal pulse)
- Feeling the fetal **movements** and parts
- **Radiograph** of the fetus
- **Ultrasonography**
- Presence of **fetal cells in the mother's blood**
- Technically advanced imaging techniques

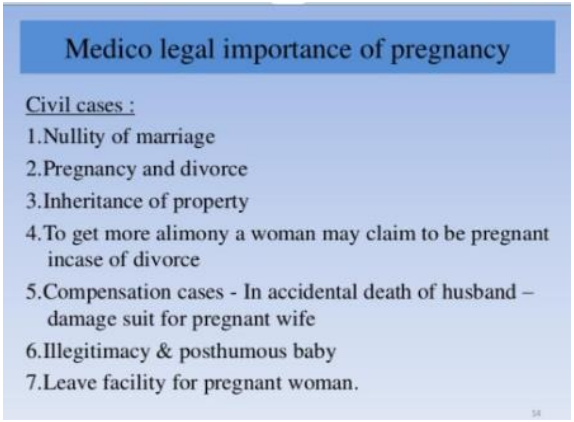
Signs of Pregnancy in the Dead

In post-mortem examination, the following diagnostic signs should be looked for;

1. Presence of an **ovum or foetus/placenta/membranes/other products of conception**
2. **Uterine changes**
3. Presence of **corpus luteum** in ovary







DEFINITION OF ZINA

The sexual intercourse committed by a man who is an adult and is not insane with a woman who is adult and not insane whom he is not or does not suspect himself to be married to.

Isqat-e-Haml (Section 338)

Causing a woman with child **whose organs have not been formed**, to miscarry, without good faith for the purpose of saving life of the woman or providing necessary treatment.

Punishment of Isqat-e-Haml (Section 338 A)

- If with consent of woman: 3yrs imprisonment
- If without consent of woman: 10yrs imprisonment

Isqat-e-Janin(Section338 B)

Causing a woman with child some of whose organs have been formed, to miscarry, without good faith for the purpose of saving life of the mother.

Punishment of Isqat-e-Janin(Section 338 C)

- If dead born child: 1/20th of diyat
- Live born but dies due to act of offender: full diyat
- Imprisonment: upto 7yrs

Delivery refers to the **process of giving birth to a baby**. It's when a pregnant woman goes into labor and the baby is born. It can be a **natural delivery**, where the baby is born through the birth canal, or

it can be a **cesarean section** (C-section), where the baby is delivered through a surgical incision in the mother's abdomen.

Medicolegal Issues of IVF

1. **Legitimacy of child**: Whether child born through surrogate method would be legitimate? Law says "no". However, if the parents adopt the child then the child becomes legitimate.
2. **Name of mother**: In some legal documents, name of mother has to be entered. The question arises whose name should be entered as mother of child? The name of genetic mother should be entered.
3. **Commercial transaction**: There is no specific law in India; however, in general law prohibits the use of body for commercial purpose.
4. **Revoking of contract**: Surrogate mother may revoke the contract and refuse to hand over the child to the couple

Unnatural sexual offences: Sexual gratification is obtain other than natural ways

- •buccal coitus
- •sodomy
- •bestiality
- •trabadism

Medicolegal importance of placenta

- At term placenta is about 500 gm in weight.
- **Period of gestation** can be estimated.
- Some **poisons may be detected** in placenta.
- **Retained placenta** or pieces of placenta may be found in criminal abortion and may be the **cause of death** due to hemorrhage.
- **Disease** can be ascertained.
- **Transfer of poisons**, drugs, bacteria or antibodies across placenta (placental barrier) may result in fetal death, fetal infections or fetal malformations.

Average Duration of Pregnancy

- The average duration of pregnancy is 266 days (38 lunar weeks) from conception or it **is 280 days (40 lunar weeks, 10 lunar months or 9 calendar months and 7 days**) from the first day of the last menstrual period in woman with regular menstrual cycles. The former is called as ovulatory age or fertilization age and later is called as **gestational age or menstrual age**.
- The ovulatory or fertilization age is usually used by histologist or embryologist
- The gestational or menstrual age is used by Obstetricians and legal professionals.

Expected date of delivery (EDD) is calculated by:

1. **Nagele's rule** – in this traditional method, EDD is calculated by **adding 7 days to the first day of the last menstrual period (LMP)** and count back three months (90 days). If a leap year intervenes, add 6 days instead of 7 days.

Example:

- **LMP**: April 10, 2024
- Add 9 months → **January 10, 2025**
- Add 7 days → **January 17, 2025** (Expected due date)

2. **Sonography method** – by measuring **crown rump length**, biparietal diameter

Evidences of Recent Delivery in Dead

1. Uterus enlarged.
2. Ovaries and fallopian tubes are **congested**.
3. Broad and round ligaments are lax.
4. Peritoneum – covering over lower part of uterus is folded and wrinkled
5. Bladder mucosa – shows congestion and edema.

Evidences of Remote Delivery in Dead

6. Uterus – size enlarged than nulliparous state. The walls are concave from inside forming a round or pear shaped uterine cavity
7. Cervix – External os shows transverse slit like opening– Cervical canal is cylindrical in shape – Internal os ill defined – Cervix may show areas of healed scars

Precipitate Labor

- It usually occurs in multigravida having wider pelvis and strong contractions
- Precipitate labour is a labour that occurs suddenly and the three stages of labour are not well defined.

Lochia: It is an alkaline discharge from the uterus having a peculiar, sour, disagreeable smell. It is composed of red blood cells, white blood cells, debris of deciduas, epithelial cells and bacteria. If infected, lochia is foul smelling. As duration of puerperium progress, the lochia changes as:

- Lochia rubra – for first 4 to 5 days, it is red and contains blood clots
- Lochia serosa – 5 to 10th day, it is watery, serous and pale
- Lochia alba – after 10th day onward, it becomes yellowish-white, thicker and scantier.
- At about 2 to 3 weeks it disappears.

Lochia is vaginal discharge that occurs after giving birth

postpartum hemorrhage, prolonged hypotension, and symptoms such as fatigue, inability to breastfeed, and failure to resume menstruation—all of which suggest **Sheehan's syndrome**. This condition is caused by **ischemic necrosis of the pituitary gland** following severe blood loss during or after childbirth.

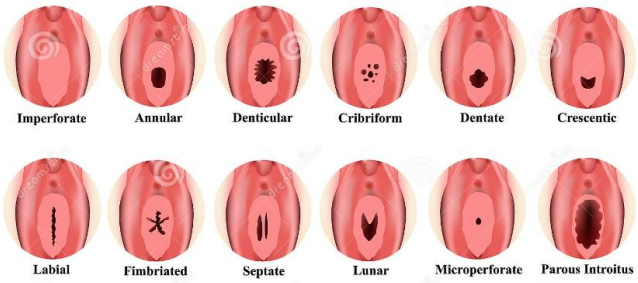
Features of a full term baby

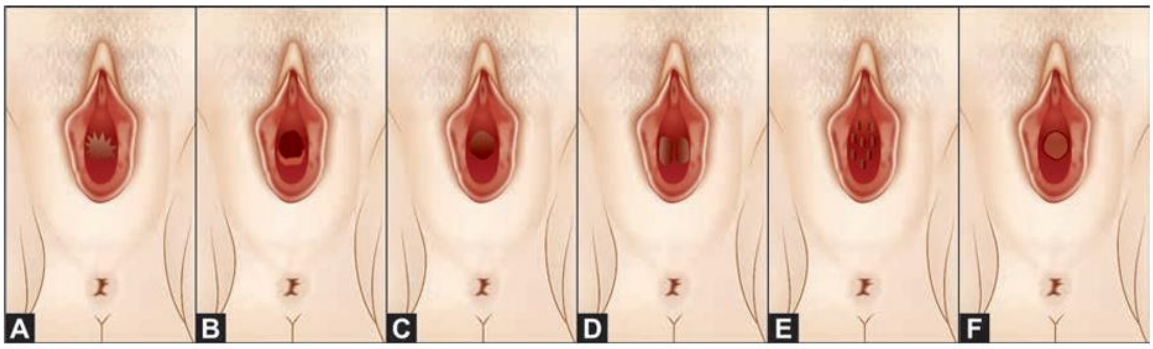
- **Length:** Crown-heel length is 48–52 cm.
- **Weight:** 2.5–3.3 kg.
- **Head Circumference:** 30–35 cm.
- **Skin:** Covered with **vernix caseosa**—whitish covering, with lanugo present only on the shoulders.
- **Nails:** Project beyond the fingertips and toe tips.
- **Genitalia:** Testicles descended in males, labia closed in females.
- **Ossification Centers:** Present at the lower end of the femur and sometimes in the cuboid .
- **Lanugo hair**

A **virgin** is a woman who has **never had any sexual intercourse**. *Defloration means loss of virginity*.

Causes of rupture of hymen

- First coitus
- Masturbation
- Trauma
- Sanitary tampons
- Gynecological examination

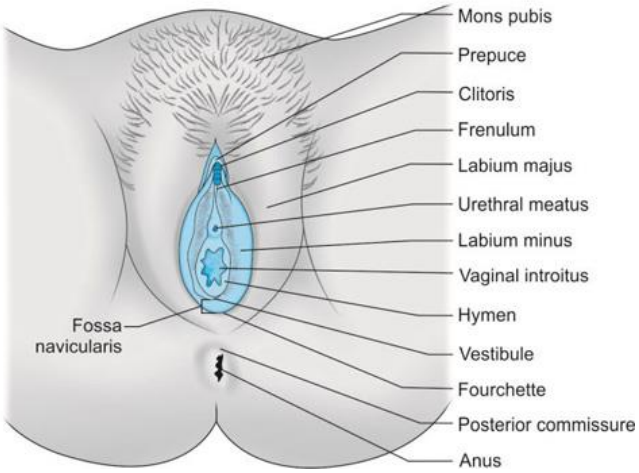




FIGS 16.1A to F: Different types of hymen. **A:** Fimbriated; **B:** Crescentic; **C:** Annular; **D:** Septate; **E:** Cribriform; **F:** Imperforate

Table 16.1: Difference between virgin and deflorated

Features	*Virgin*	*Deflorated*
Definition	One who has never had sexual intercourse	Means loss of virginity
Breast	Hemispherical and firm, areola pinkish, nipple small	Pendulous, enlarged
Labia majora	Firm, lie in apposition	Separated and flabby
Labia minora	Pink, soft	Enlarged, pigmented, separated, peep out
Fourchette	Intact	May be intact/torn or may show healed scar
Fossa navicularis	Less conspicuous	Disappears
Hymen	Intact, edges are distinct and regular with narrow opening	Usually torn (in false virgin, it may remain intact)
Vagina	Narrow, apposed, mucosa rugose, sensitive	Wide, capacious, rugosity may partially lost



IMPORTANCE OF HYMEN

- The *marginal type* of hymen may appear intact even when sexual intercourse has taken place whereas the *fimbriated type* of hymen may appear torn even in the intact state
- The hymen may remain intact even after sexual inter course. In such cases, the hymen is elastic, fleshy and yielding type. Such female who had sexual intercourse and even have intact hymen are called as **false virgins**.
- **Hymenoplasty** – is surgical repair to form a hymen. The hymen is usually *taut*, has *narrow aperture* and reveal *fine surgical scars* at the site of repair of previous tears

RUPTURE OF HYMEN:

As a result of **sexual intercourse**, the hymen is usually torn **posteriorly** at **6 O'clock position** or may tear at **postero-lateral** sites (**5 O'clock** and/or **7 O'clock position**) as bilateral tears

A **habituated female** (i.e. female who had frequent sexual intercourse) shows torn hymen known as **carunculae hymenalis**

A female who had given **birth to child** exhibits only remnants of hymen known as **carunculae myrtiformes**

disease like **diphtheria** destroys the entire hymen

Sexual offences are classified as:

2. Natural sexual offenses
- Rape (**375 PPC**. Rape)
- Adultery
- Incest (This is the act of sexual intercourse by a man with a woman within a certain degree of blood relationship.)

3. Unnatural sexual offenses
- Sodomy (It is anal intercourse between man and man or between man and woman i.e. it is **penile-anal intercourse**. AKA **buggery**. The person who is doing anal intercourse (i.e. the **offender**) is called as **active agent** and other partner is called as passive agent. It is called as **pederasty** when the passive agent is a child and child is known as **catamite**. • Rarely, sodomy may be practiced by two men who **alter natively act as active and passive agent**)
- Lesbianism (Also called as tribadism, sappism or female homo-sexuals)

- Bestiality (It means sexual intercourse by a human being with a lower animal)
- Buccal coitus (**Buccal-penile** act is called as "**fellatio**"---- "**cunnilingus**" (i.e. the practice is **Buccal-vaginal** act----**Anilingus** is the sexual activity in which the **anus** is licked, sucked or rubbed by the lips and/or tongue.)

4. Sexual deviations/perversions/paraphilias

- **Fetishism** (In this sexual deviation, the male experiences sexual gratification by seeing some part of body of a female or some article belonging to her)
- **Transvestism** (In this deviation, there is desire to wear the clothes of opposite sex)
- **Sadism** (In sadism, the person gets sexual gratification (sexual arousal and orgasm) **by inflicting pain**, torture and humiliation to other partner.)
- **Masochism** (Here the person gets sexual gratification from being bit ten, tortured or humiliated by partner)
- **Bondage** (This is a condition where both sadism and masochism are present)
- **Exhibitionism** (In exhibitionism, the sexual pleasure is obtained by indecent exposure of the genital organ in public place.)
- **Voyeurism** (scoptophilia) • In this deviation, sexual pleasure is obtained by repeatedly seeing (or looking or peeping) the other person while undressing, bathing or doing sexual intercourse. PEEPING TOMS
- **Myxoscopia** Sexual pleasure obtained by watching sexual intercourse of other person or couple. It is a type of voyeurism
- **Troilism**: It is extreme form of voyeurism where husband get sexual gratification by watching or seeing his wife doing sexual intercourse with another person.
- **frotteurism** • In this deviation, sexual satisfaction is obtained by touching the body or body parts of other person. For example in a crowded city bus, a male may rub his genital organ with buttocks of female standing with him or a person may touch private parts of female.
- **necrophagia** • Sexual pleasure is obtained by eating flesh of a dead person. • It is extreme degree of sadism
- **necrophilia** • In this condition, sexual pleasure is obtained by doing sexual intercourse with dead bodies
- **Masturbation** • In this condition, sexual gratification is obtained by deliberate self-stimulation of own genital organ. • It is offense when practiced in public place.
- **Pedophilia:** A pedophile is an adult who repeatedly engages in sexual activities with pre-pubescent children
- **satyriasis** Excessive sexual desire and drive in males.
- **nymphomania** Excessive sexual desire and drive in females.
- **Pornographomania** Sexual pleasure obtained by watching or referring porno graphic material or literature.
- **Erotographomania** Sexual pleasure is obtained by obscene and vulgar writings in public places. For example, writing vulgar things in public urinals, train toilets etc.
- **Coprolalia** Sexual pleasure obtained by using obscene and vulgar language in public.
- **undism** Sexual satisfaction obtained by watching the act of urination of another person.
- **Coprophilia** Sexual gratification achieved by smelling or touching fecal matter (stool) of opposite sex.
- **Ecoutage** Sexual pleasure obtained by hearing sounds of love-making or sexual intercourse.
- **Pygmalionism** Sexual gratification achieved by watching or handling nude statues of opposite sex.

- **gerontophilia** or **gerontosexuality** The term gerontophilia is used to denote a specific sexual inclination towards the elderly.
- **Bobbit syndrome:** In this type of perversion, the female partner amputes the penis of her male partner with a sharp cutting weapon.

5. Sex-linked offenses

- Indecent assault (It is an offense committed on a female with intent or knowledge to outrage her modesty. For example, slapping over buttock or pressing thigh)
- Offenses under Immoral Traffic Act

Rape definition: A man is said to commit rape who has sexual intercourse with a woman under circumstances falling under any of the five following descriptions,

(i) against her **will**
(ii) without her **consent**
(iii) with her consent, when the consent has been obtained by **putting her in fear of death** or of hurt,
(iv) with her consent, when the man knows that he is not married to her and that the consent is given because **she believes that the man is another person** to whom she is or or believes herself to be married; or
(v) With or without her consent when she is **under sixteen years of age**.

Medicolegal aspects of rape

- Rape and resistance
- Raping a woman in deep sleep
- Anaesthesia and rape charges
- Rape by false impersonation
- False accusation of rape or feigned rape
- Rape by misrepresented facts

Steps of examination of rape and sodomy: (IMP)

STEP	DESCRIPTION
Pre examination	Authority, consent, bio data information, establishment of personal identity
History	General, obstetric (in females) and specific
General impression	Dress , makeup and mental status
Examination of body general systemic genital	Built, stature, vitals and general injuries All organ systems Condition of the genitals and anal canal
Collection of specimens	From the clothes, body and genitals

Doctors, examining a victim of rape are shouldered with dual responsibilities, firstly they have to **treat the patient** and provide support and secondly they have to **examine the victim and collect material evidences** to facilitate and aid the justice.

1. Written informed consent
2. History:

General and obstetric history

- Medication within the last 24 hour
- Previous sexual experience and marital status.
- Menstrual history
- Detailed obstetrical history
- Change of clothes, general bath or washing of the genitals.

Specific History

- Time and place of the act
- Who removed the clothes
- Relative position during the act
- Pain during or after the act
- Violence used by assailant
- Penile penetration
- Whether ejaculation took place outside or inside

Examination of clothes

- Make the examining stand on plain white cloth.
- Undressing by the examinee herself while standing on the sheet.
- Any items or material dropped during undressing should be collected for further examination in the laboratory to confirm the source of origin.
- Clothes are spread in proper light and inspected for any derangement, damage and staining.

Examination of the body

- General physical examination.
- Skin of whole body is inspected to locate injuries, stains, lose hair or any other form of trace evidence.
- Injuries may be bruises, abrasions or bite marks and should be palpated for tenderness.

Systemic examination

- Systemic examination of both assailant and victim should be done in all types of cases.
- It is necessary to rule out the possibility of subsequent false defense plea by the assailant on the grounds of physical inability or any systemic disease.

Genital examination

- Most important step of the examination.
- Findings of vagina and anal canal will depend upon physical disproportion between these canals and the penis of the accused and upon the extent of physical violence.
- Factors like time interval between the sexual act, previous experience of the sexual intercourse, first aid rendered after the act, change of clothes and washing of the parts modifies findings.

Vaginal examination

- It is performed in lithotomy position in a place properly equipped.

- Light should be adequate.
- There are four steps: ***IBDS***

Inspection (visual scrutiny) youtube

- Special attention is paid to the condition of **labia majora** and **minora, mons pubis** and **adjacent thighs**.
- Note any redness, swelling, lesion, bleeding or discharge from vulva.
- Injuries, such as bruises or scratches, stains and loose hair in the area should be looked for.
- Pubic hair soiled or matted.

Bilateral traction

- It is performed to see the condition of the hymen.
- *A female with an intact hymen is called* ***Virgo intacta***.
- In cases of laceration of hymen, **the site and extent of a tear is an important feature**.
- Determination of location is facilitated by use of **Glaister keen glass rods** by placing the lit end of the rod on the inner side of the hymen and moving it along the edges.
- The instrument is also useful in differentiating recent from old tears.
- **Digital tears** (caused by fingers) are incomplete and are situated either anteriorly or posteriorly
- Whereas **tears due to sexual intercourse** are complete and situated posterolaterally really extending beyond the hymenial attachment
- Extended injury occurs in cases of great disproportion
- If victim is virgo intacta, digital and instrumental examination must not be performed.

Digital examination

- It is meant to gauge the **size**, **tone**, any **tenderness** or **laxity** of the **vaginal canal**.
- It is done by introducing a gloved index finger into the vagina and moving its palmer aspect over the vaginal epithelium all around to note the degree of lateral pressure over the index finger and extent of rouginess on the bulb of the finger.

Specular examination

- *It should be performed in sexually experienced women only*.
- An appropriate size speculum is introduced into the vagina to inspect the condition of the vaginal mucosa, its rouginess and to locate any bleeding, injury or any other condition of the vaginal mucosa.
- The cervical part of the uterus can also be inspected during this stage.
- The examination may be painful in cases of recent injury.
- This examination allows the inspection of vaginal mucosa.

- The bruises of the vaginal mucosa appear as dark brown areas mostly on the anterior wall in the upper third.
- Laceration of vagina usually does not occur.

List of specimen from victim (IMP)

2. **Clothes** entire lot (bearing stains and soiling)
3. Loose and matted **hair**
4. **Swabs**
    a) from the **body**
    1. **seminal** stains (areas other than vagina)
    2. **salivary** stains from bite marks
    b) from the **vagina**
    1. from introitus, perinium
    2. from lower vagina (passing a swab just into the area above to hymenal boundary)
    3. from high vagina
    c) from **anal margins**
    d) from the **posterior fornix**
5. Scrapings from **under surface of the nails**.
6. **urine** for screening of drugs and venereal diseases (diseases/infections due to intercourse).
7. Control specimen
    a) Blood
    b) Plucked hair (2 each)
        a. head hair
        b. pubic hair
    c) Saliva

Examination of the accused

- The preliminary data
- Physical examination and mental condition
- Signs of struggle on the clothes and body
- Local examination of the genitals
- The examination of the accused should always be made as soon as it is can be arranged for and the exact time and date should be mentioned.

Physical examination

- Note the **size** and **physique** of the assailant to determine the ability of the victim to offer resistance and to assess genital injuries sustained by her.
- The mental condition and any signs of drunkenness should be specially noted

Signs of struggle

- **Injuries** inflicted by the victim.
- Clothes should be examined for **missing buttons** or presence of **foreign hairs**, **foreign fabrics**, **lipstick** or **makeup soiling**, **mud stains**, **grass** etc.
- General marks of violence such as **bites**, **bruises** and **scratches** may be found on the face, hands or private parts.

Genital examination

- Seminal stains and blood stains may be found about the pubic hair.
- The blood stains if dry should be scrapped with a clean, blunt scalpel.
- The penis should be examined for the presence of **smegma**.
- The presence of a **torn frenum** is consistent with a recent intercourse.
- In a recent case the penis should be examined for the presence of **vaginal epithelial cells** on its surface unless the assailant has used a condom.
- The assailant should be examined to determine if there is anything to suggest that he is impotent.
- Blood can also be taken for grouping, and this may be of value if the group of the seminal matter found on the victim can be ascertained.

Opinion

- It should include **both positive and negative findings**.
- The opinion must be **based on the recorded data**.
- If the damage is to the vagina and female victim are proportionate to the size of the penis of the assailant, it should be certified accordingly stating that the medical examination findings are consistent with the allegation.

LOCAL EXAMINATION OF A SODOMY

- Knee elbow position
- Inspection for local injuries
- Collection of specimens
- Digital examination of tone and tenderness of external anal sphincter
- Take swabs in and out of anal canal
- NON-HABITUAL CATAMITE: anal orfice dilated, tender, bruising, gait and defecation is painful
- HABITUAL CATAMITE: anal skin smooth and thick, anal orfice deep (funnel shaped), anal fissure maybe present.

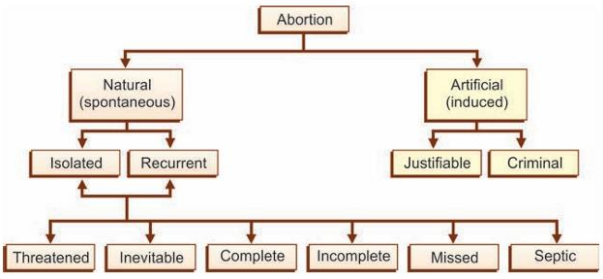
Abortion: termination of pregnancy (aboriri= to detach)

Abortion is premature expulsion of products of conception from womb, either spontaneous or induced at any time before the period of gestation is completed

- WHO definition= expulsion of fetus/embryo from mother less than 500gm which is not capable of independent survival.
- Legal Definition= epulsion of the product of conception from uterus prior to full term
- Unsafe abortion= service not provided by approved facilities
- Abortus= no viable product of abortion
- Acc to gynae(1^{st} trimester= abortion. 2^{nd} trimester= miscarriage. 3^{rd} trimester= premature delivery) acc to forensics (all are termed as abortions)
  CLASSIFICATION OF ABORTION
  1. Spontaneous (natural)
     - isolated
     - recurrent (repeated)
  2. Induced (artificial)--- willfully/deliberately
     - legal
     - criminal

3. fabricated

Table 19.1: Causes of spontaneous abortion
Causes of abortion
1. Chromosomal abnormalities
- Trisomy
- Triploidy
- Turner's syndrome
- Blighted ova
2. Abnormalities of placenta
- Acute hydramnios
- Multiple pregnancy
- Hydatidiform mole
- Placenta praevi
3. Infection of mother
- Acute infections like malaria
- Toxoplasmosis
- Syphilis
- Listeria monocytogens
4. Disease of mother
- Hypertension
- Chronic nephritis
5. Drugs/radiation
- Inhalation of nitrous oxide
- X-rays
6. Local abnormalities
- Retroverted uterus
- Fibromyoma
- Cervical incompetence



Motives of criminal abortion:

- Unmarried girls/widows (when child is product of illicit sexual intercourse)
- Poor family (to avoid the addition of a member to family.)
- Female feticide (killing of female fetus)

It is illegal to force the doctor to tell the sex of the baby.

Isqat e hamal (sec 338 PPC) ---- TO PROTECT THE LIFE OF MOTHER AND PROVIDE NECESSARY TREATMENT--- ORGANS NOT FORMED

Isqat e janin (sec 338-B PPC)--- TO PROJECT THE LIFE OF MOTHER--- SOME ORGANS FORMED

Methods to induce Criminal Abortion are

1. Use of abortifacient drugs
2. Application of mechanical violence

Table 19.2: Means used to induce criminal abortion
Methods used
A. *Abortifacient drugs*
1. Ecbolics
2. Emmenogogues
3. Irritant poisons
4. Systemic poisons
5. Abortion pills
6. Abortion stick
B. *Mechanical violence*
1. General violence
2. Local violence

ABORTIFACIENT DRUGS

- **Ecbolics**: These drugs initiate **uterine contraction** and causes abortion. Examples are Ergot preparations– Synthetic estrogen– Pituitary extract– Quinine (ANTI MALARIAL)

- **Emmenagogues**: These drugs promote **uterine congestion** and **induce bleeding** thus expelling product of conception. Examples are: – Borax– Sanguinarine– Oil of savin
- **Genitourinary tract irritants** – these agents produce inflammation of genitorurinary tract and **reflexly irritate the uterus** and induce uterine contraction – example Cantharides, turpentine oil.
- **Gastrointestinal tract irritants** – these agents cause **reflex contraction of uterine muscles** – example: croton oil, colocynth etc.–
- **Systemic poisons** – For example: arsenic, mercury, calatropis, copper, unripe fruit of papaya, Plumbago etc.–
- **Abortion pills** – these pills are made up of **lead diphenylephylene**

MECHANICAL VOILENCE

General violence – may act **directly** (blows or kicks over abdomen OR cupping (placental seperation)) or **indirectly** (Severe form of exercise like excessive cycling, riding, jumping) on uterus.

Local method

A) By unskilled or semiskilled person – **Rupture** of membrane by abortion stick, metal rod, knitting needle, hair pin etc. Application of **abortion paste**– Use of root of plant as **Abortifacient agent** – **Syringing**: either for aspiration of fluid or forced filling of uterine cavity with fluid and air.

B) By skilled person– Low rupture of membrane– Vacuum aspiration– Dilatation and evacuation– Use of laminaria tent– Use of prostaglandin

FIG. 19.6: Abortion stick

Table 19.3: Showing difference between natural and criminal abortion

Features	*Natural abortion*	*Criminal abortion*
Reason	Predisposing disease	History of pregnancy in unmarried girl or widow
Infection	Rare	Frequent
Injuries to genitals	Absent	Frequently present
Signs of violence	Absent	Present
Application of chemical or drugs	Absent	Present
Foreign body	Absent	Present

Complication of Criminal Abortion

- **Immediate**:
  1. Haemorrhage
  2. Perforation of uterus
  3. Shock due to vagal inhibition resulting from instrumentation
  4. Fat embolism (due to SOAPY FLUID)
  5. Air embolism (due to AIR INSUFFLATION)
  6. Amniotic fluid embolism
  7. Incomplete abortion
  8. Local injury
- **Delayed**
  1. Septicaemia
  2. Tetanus
  3. Endometritis
  4. Renal failure
  5. Peritonitis
  6. Sterility

7. Recurrent abortion

- **Systemic**

  1. jaundice
  2. Hepatitis
  3. RF
  4. Endocarditis
  5. Pneumonitis
  6. Pulmonary embolism
  7. Suppurative meningitis
- **Remote**
  1. Ill health
  2. Secondary infertility
  3. Dyspenuria
  4. Repseated abortions

Causes of Death in Criminal Abortion 1. Vaso-vagal shock 2. Hemorrhagic shock 3. Perforation of uterus 4. Septicemia 5. Embolism 6. Disseminated intravascular coagulation

Legal Duties of a Doctor in Case of Criminal Abortion

1. **Patient Examination:**
   - Gather detailed history, especially regarding how the abortion was induced.

- Document general condition, signs present in the genital organs, and any visible injuriesreatment and Care:**
- Provide the best possible care for the patient.
- Do not attempt any treatment that may lead to criminal charges.

2. **Professional Responsibility:**
   - Keep the information confidential (doctor–patient privilege).
   - If the patient is seriously ill, inform the police.
   - In case of imminent death, arrange for a **dying declaration** or deposition before a magistrate .
3. **Duties (If Death Occurs):**
   - Do not issue a death certificate.
   - Report the matter to the police for further investigation .
4. **Avoid Crimiy:**
   - Take necessary precautions to avoid actions that could result in criminal charges.
   - Seek consultation with a professional colleague when needed .

DUTIES OF RMP: When a female comes to RMP with history of criminal abortion or attempted criminal abortion, then**: 1**. Doctor should record history of the incident, the method adopted to procure abortion. **2**. If death is imminent, doctor must arrange for dying declaration. **3**. If female dies, he should report matter to the police.

SEPTIC ABORTION: mixed infection--- 1. Strept, staph, pseudomonas ----causes: medical quacks, incomplete evacuation of the product of conception, injuries>95% cases

Criminal abortion klye knse specimens collect keye jatte hai..

Examination of Female (After Death)

- Clothes: Undergarments may show blood, clots, pieces of product of conception, stains of chemicals used etc.
- Uterus: Enlarged, cavity may show presence of partially separated product of conception, foreign body, blood clots, presence of any paste or chemical, evidence of injury or perforation etc.
- Evidence of infection
- Ovaries: Presence of corpus luteum

Medical Evidence of Abortion It consists of

1. Examination of **female**.

2. Examination of **aborted material**.

Informed refusal: inform the authority but DON'T examine

Medicolegal Importance of Abortion

1. When abortion is induced **without proper indication** or in contravention to the provisions of MTP Act, it is considered as criminal abortion and is **punishable by law**.
2. When Doctor violates the provisions of MTP Act, he is liable to be punished by the law and similarly his act amount to misconduct in professional sense.
3. To bring a **false charge of assault against any person**, a female may plead that she has been assaulted and due to assault, **abortion was induced**.
4. A female may be **falsely charged** or implicated **for inducing criminal abortion**.

Impotence, in male, is defined as “persistent inability to develop or maintain a penile erection sufficient to conclude coitus to orgasm and ejaculation

Types of Impotence Impotence may be: 1. Temporary 2. Permanent

Aversion to sexual intercourse with a particular female. It means that a person is potent with other female but becomes impotent with particular female. This condition is referred as **impotence quod hanc.**

Aversion to sexual practice in general i.e. with all females. This condition is called as **sexual aversion disorder**

CAUSES OF IMPOTENCE

- **Endocrine causes** –Testicular failure (primary or secondary) –Hyperprolactinemia
- **Disease of penis** –Peyronie’s disease –Previous priapism –Penile trauma
- **Disorders of CNS and spine** –Anterior temporal lobe lesions –Disease of spinal cord –Tabes dorsalis –Disease of dorsal root ganglia
- **Vascular disorders** –Leriche syndrome –Atherosclerotic occlusion or stenosis of the pudendal and/or cavernosa arteries –Arterial damage from pelvic radiation –Venous leak –Disease of sinusoidal spaces
- **Drug induced** –Histamine (H2) blockers e.g. cimetidine –Spironolactone –Ketoconazole –Clonidine –Beta blockers –Monoamine oxidase inhibitors –Tricyclic antidepressants –Barbiturates –Diazepam –Alcohol –Heroin –Tobacco –Methadone

MLI

Civil cases:

1. Nullity of marriage and divorce
2. In cases of disputed paternity – a man may claim that, he being impotent has not fathered the child
3. Compensation cases – a man may claim higher com pensation for an injury that has caused him impotent

Criminal cases:

1. Impotence may be taken as plea for rape cases, unnatural sexual offenses.
2. Impotence may be stated as plea for adultery.

Frigidity is a psychological defect in female having an abnormal aversion to sexual intercourse.

Vaginismus is a psychosomatic condition, which causes copulation difficult. Whenever, sexual inter course is attempted, there is **painful spasm** of sphincter vaginae and levator ani with simultaneous spasmodic contraction of the adductor muscles of thighs and erector spinee, thus making penetration impossible

Medicolegal Importance 1. Nullity of marriage 2. Divorce cases

Sterility means inability of a person to procreate

Medicolegal Importance

1. Disputed paternity – the putative father may take plea that he being sterile, has not fathered the child.
2. Compensation cases – for loss of reproductive capability as a result of injury or occupation or surgical operation.
3. In adoption cases – sterility can be taken as a plea for adoption purposes.
4. Absolute sterility in male may be one of indication for artificial insemination.

● **SUPERFOETATION**

● **SUPERFECUNDATION**

Fertilization of 2 separate ova which have been discharged from the ovary at the same period of ovulation by 2 separate acts of coitus

fertilization of 2 separate ova discharged from the ovary at different period of ovulation.

In order for a child to be considered legitimate, there are typically legal and social conditions that must be met. These conditions can vary depending on the jurisdiction and cultural norms. Legitimacy is often determined by the marital status of the child's parents at the time of birth. In many societies, a child born to married parents is automatically considered legitimate. However, in cases where the parents are not married, there may be legal processes, such as establishing paternity through DNA testing or the voluntary acknowledgment of paternity, that can establish the child's legitimacy.

Generally, if there is suspicion of criminal abortion, the authorities may collect various types of evidence, such as fetal tissue, blood samples, or DNA samples.

Legitimacy

A child born during the continuance of a valid **marriage** between his mother and any man or **within 280** days after its dissolution, the **mother remaining unmarried** is presumed to be legitimate.

The child becomes illegitimate or bastard, if:

1. The child is born out of wedlock OR
2. Birth of child is not within a competent period after the cessation of the relationship of a man and wife OR
3. Born within wedlock when procreation by the husband is not possible because of congenital or acquired malformation or disease

Medicolegal considerations:

Question of legitimacy of child arises in following conditions:

1. **Inheritance**: A legitimate child is entitled to inherit the property of his father.

2. **Affiliation cases**: If a woman had made charges against a man that he is father of that child, in such cases, the court can sanction a **monthly allowance for maintenance of child**.

3. **Suppositious child**: A suppositious child means fictitious child. A woman may produce a child (which is not her child) and **pretend** that she was pregnant and delivered this child by the particular man. Such cases occur for succession of estate.

4. Paternity cases

ATAVISM is a state where a child does not resemble his or her parents but resembles with grandfather

Posthumous child is a child born after the death of his father.

C. MED

Ergonomics.

Biomedical waste.

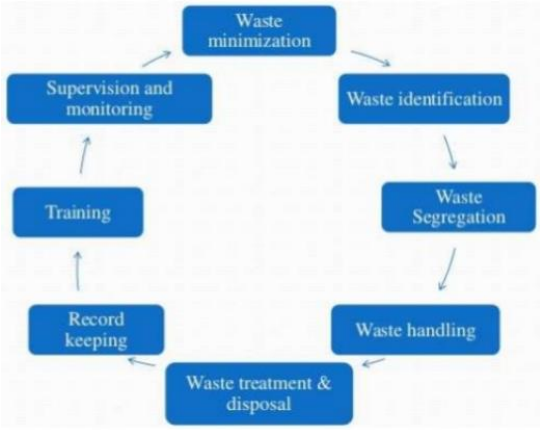
Everything is made for a defined purpose anything that is not intended for further use is called **waste**.

- **Hospital waste** is "Any **waste** which is generated in the diagnosis, treatment or immunization of human beings or animals or in research" in a **hospital**. This is also called 'Bio-Medical Waste' (BMW).
- **Hospital Waste** Management means the management of **waste** produced by **hospitals** using such techniques that will help to check the spread of diseases through.

WHO CLASSIFICATION

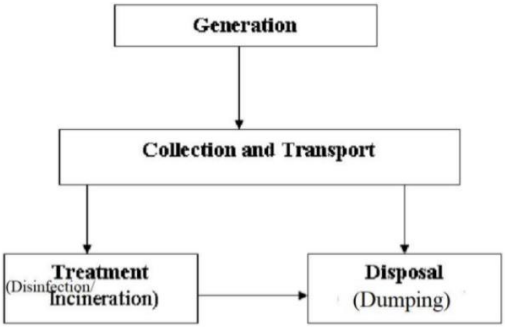
	Waste Categories	Description and Examples
Non-Hazardous:	1.General Waste	No risk to human health eg:office paper,wrapper,kitchen waste,general sweeping etc.
Hazardous:	2.Pathological Waste	Human Tissue or fluid eg:body parts,blood,body fluids etc.
	3.Sharps	Sharp waste eg:Needle,scaples,knives,blades etc.
	4.Infectious waste	Which may transmit bacterial,viral or parasitica disease to human being,waste suspected to contain pathogen eg:labrotory culture,tissues(swabs)bandage etc.
	5.Chemical waste	Eg:Labrotory reagent,disinfectants,Film Developer
	6.Radio-active waste	Eg: unused liquid from radiotherapy or lab research,contaminated glasswares etc.

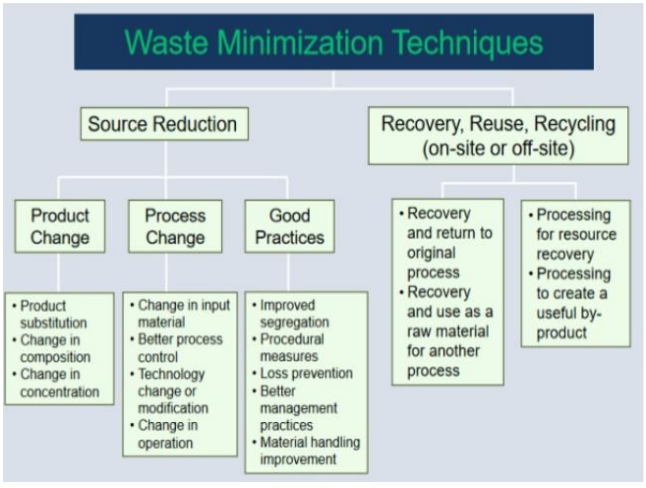
WHO Hospital Waste Management Cycle



Steps in Management of Hospital Waste

Steps in the management of hospital waste include : -
- Training and Awareness
- Generation
- Segregation / separation
- Collection
- Transportation
- Storage
- Treatment
- Final disposal





Waste minimization is a process of elimination that involves reducing the amount of waste produced in society and helps to eliminate the generation of harmful and persistent wastes.

Waste handling means the links between packing, storage and transportation of medical waste from every area of the institution by designated individual.

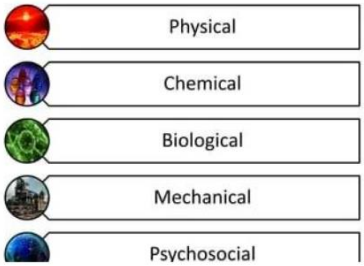
Occupational health: Bernardino Ramazzini (1633 - 1714) is known as the "father of occupational medicine.

Occupational Health

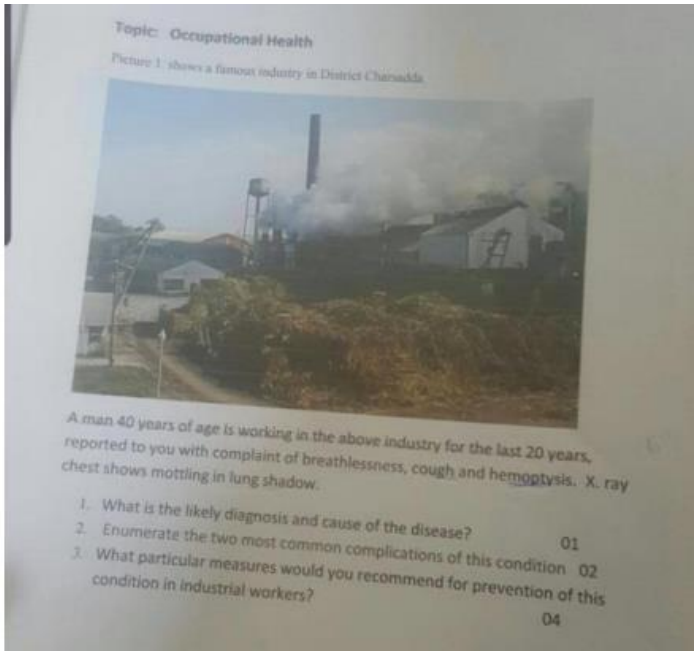
- *Aim* at the promotion and maintenance of the highest degree of **physical, mental and social well being** of workers in all occupations
- *Prevention* amongst workers of **departures from health** caused by their working conditions
- *Protection* of workers in their **employment from risks** resulting from factors adverse to health

- *Placing and maintenance of the worker* in an occupational environment **adapted to his physiological and psychological equipment**
- The adaptation of work to man and of each man to his job
- **Ergonomics** is now a well recognized discipline and constitutes an integral part of any advanced occupational health service. The term "ergonomics" is derived from the Greek ergon, meaning work and nomos, meaning law. It simply means: **"fitting the job to the worker"**

Occupational Hazards



On average, hospitals generate around 10-25% of hazardous waste and 75-90% of non-hazardous waste.

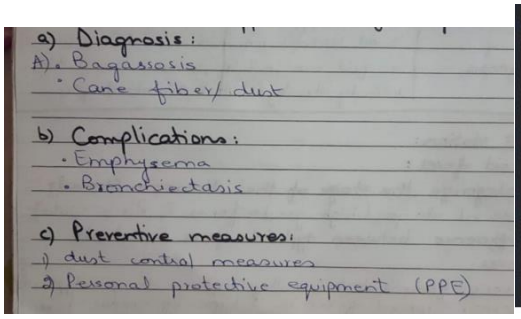


Topic: Occupational Health

Picture 1: shows a famous industry in District Charsadda

A man 40 years of age is working in the above industry for the last 20 years, reported to you with complaint of breathlessness, cough and hemoptysis. X. ray chest shows mottling in lung shadow.

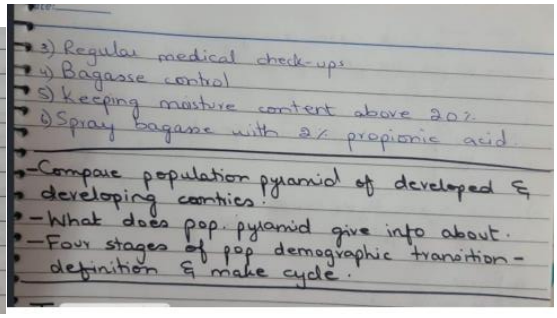
1. What is the likely diagnosis and cause of the disease? 01
2. Enumerate the two most common complications of this condition 02
3. What particular measures would you recommend for prevention of this condition in industrial workers? 04



a) Diagnosis:
A). Bagassosis
- Cane fiber/ dust

b) Complications:
- Emphysema
- Bronchiectasis

c) Preventive measures:
1) dust control measures
2) Personal protective equipment (PPE)



3) Regular medical check-ups
4) Bagasse control
5) Keeping moisture content above 20%
6) Spray bagasse with 2% propionic acid

-Compare population pyramid of developed & developing countries.
-What does pop. pyramid give info about.
-Four stages of pop demographic transition - definition & make cycle.

Health hazard types:

Health hazard definition

Disaster and types: A disaster is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources

1. Natural disaster
2. Manmade disaster

4 CAUSES BEHIND MANMADE DISASTERS

- Human intention
- Human negligence
- Human error
- Failure of system constituted

TERRORISM:

Violent action targeting civilians exclusively. Use or threatened use of violence for the purpose of creating fear in order to achieve a political, religious or ideological goals.

Topic: Disaster Management

The above picture is taken after a disaster which took about 86000 human lives and an economical loss of about 5 billion us dollars?

1. Which type of disaster is shown in the above picture? [1]
2. What mitigation measures should be taken in an area after such a disaster? [2]
3. Which factors might have caused such a huge human loss? [2]
4. What psychological effects did the survivors of that incident suffer? [2]

Final professional exam 2016, Department of Community Medicine, KGMC.

Com Med KGMC Annual OSP

Topic: Disaster Management

Question: 6 (Total marks 7)

(Time 4 min)

Fig: shows a patient of heat stroke

A severe heat wave struck Pakistan in June 2015, mostly affecting Karachi and Sind, causing more than 3,000 deaths.

a) State the probable causes of this heat wave (03)

b) Describe briefly why so much causalities had occurred (03)

c) Write down the most appropriate way for the awareness of general public. (01)

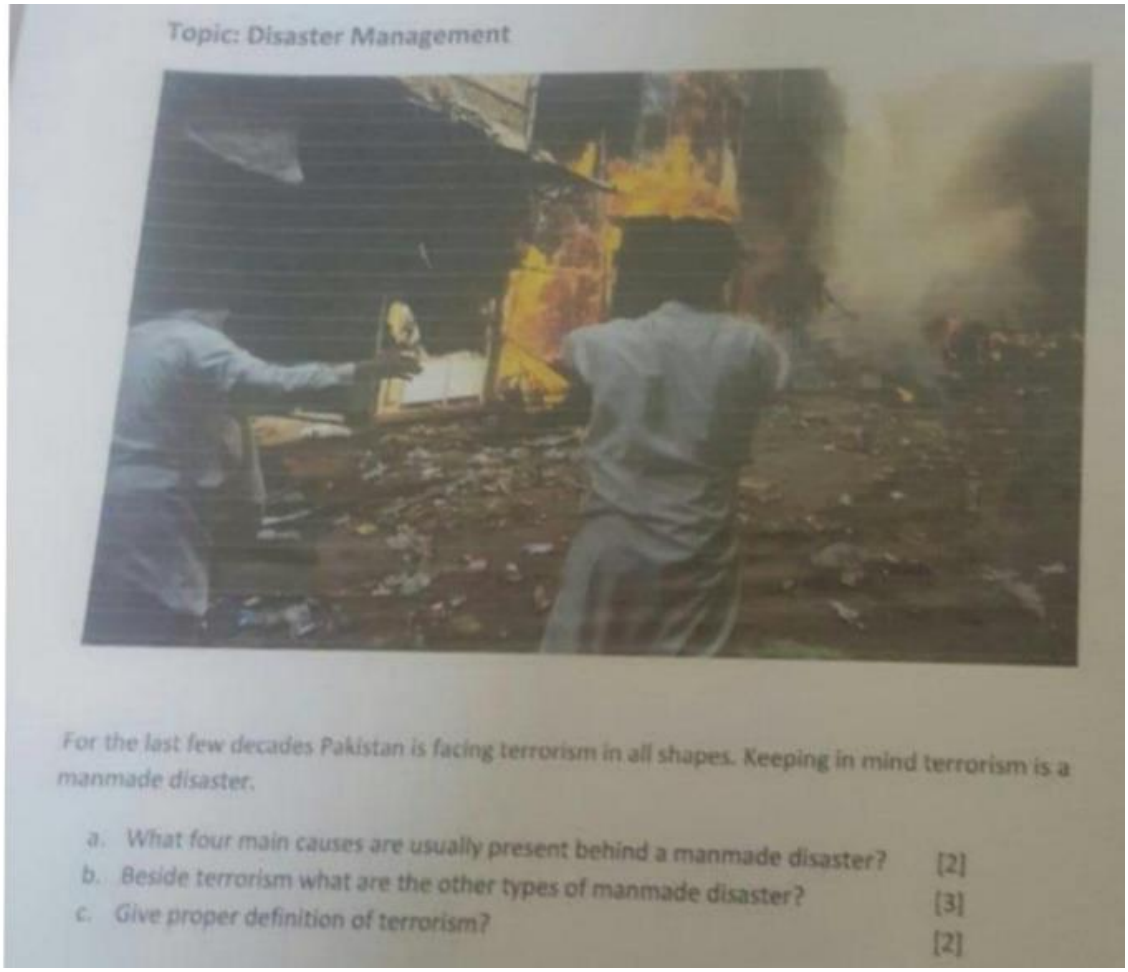
Disaster managment :- (Heat wave)

Probable causes :-

a) → Global climate change aggravated by deforestation, rapid urbanization & expansion of super-highways.

b) (i) Lack of managment
(ii) Lack of mass education

c) (i) Mass education through electronic media



Topic: Disaster Management

For the last few decades Pakistan is facing terrorism in all shapes. Keeping in mind terrorism is a manmade disaster.

a. What four main causes are usually present behind a manmade disaster? [2]
b. Beside terrorism what are the other types of manmade disaster? [3]
c. Give proper definition of terrorism? [2]

HIV and AIDS difference

HIV is the virus; AIDS is the late-stage disease caused by HIV.

- In children, parameters used to measure growth are weight in kilograms, height in meters and head and chest circumferences

The **6 Pillars of Safe Motherhood** are essential strategies to improve maternal health and reduce maternal mortality:

1. **Family Planning** – Preventing unintended pregnancies and ensuring proper birth spacing.
2. **Antenatal Care** – Regular check-ups during pregnancy to monitor and manage health risks.
3. **Obstetric Care (Essential and Emergency)** – Skilled care during childbirth and access to emergency services for complications.
4. **Postnatal Care** – Follow-up care for mother and baby in the immediate postpartum period.
5. **Prevention and Management of Unsafe Abortion** – Ensuring access to safe abortion services where legal and post-abortion care.
6. **Reproductive Health Education and Advocacy** – Raising awareness about maternal health, rights, and available services.

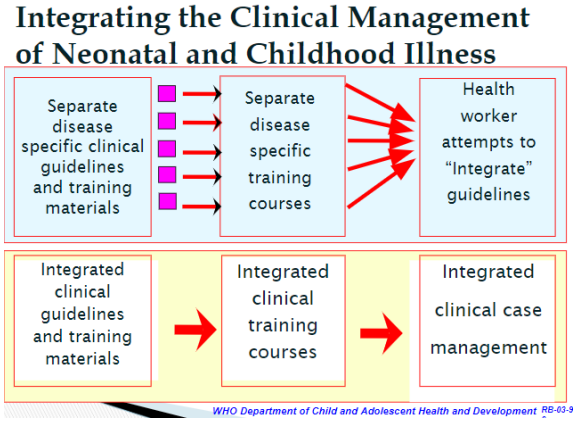
Ergonomics: The science of designing and arranging workplaces, products, and systems to fit the user, aiming to improve efficiency, comfort, and safety.

It focuses on reducing strain, preventing injuries, and enhancing productivity by adapting the environment to human needs.

IMNCI: Integrated Management of Neonatal and Childhood Illness (IMNCI) . It's a strategy to improve healthcare for kids. It focuses on early identification and proper management of common illnesses in children under five.

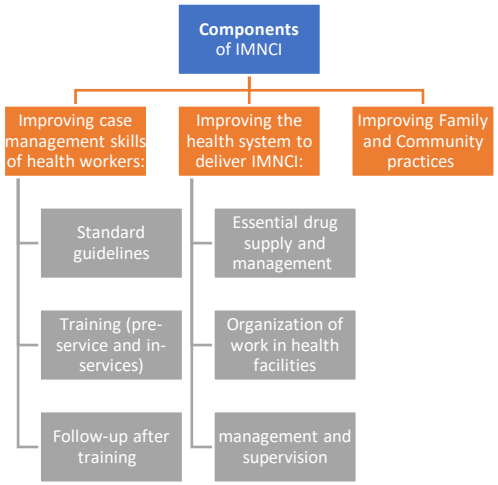
Objectives of IMNCI Strategy

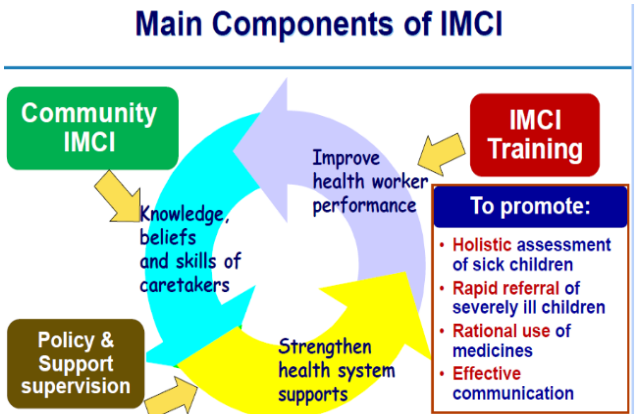
- To reduce significantly mortality and morbidity associated with the major causes of disease in children.
- To contribute to healthy growth and development of children.



Strategy

- *Is **not** another vertical program*
- Incorporates elements of diarrheal diseases and ARI control program and child oriented aspects of malaria control, nutrition, EPI and other relevant programs
- Depends on: effective functioning of essential drugs and EPI program
- Demands and Facilitates: active collaboration of all these existing programs
- Improves the quality of care of sick children in the primary health care context

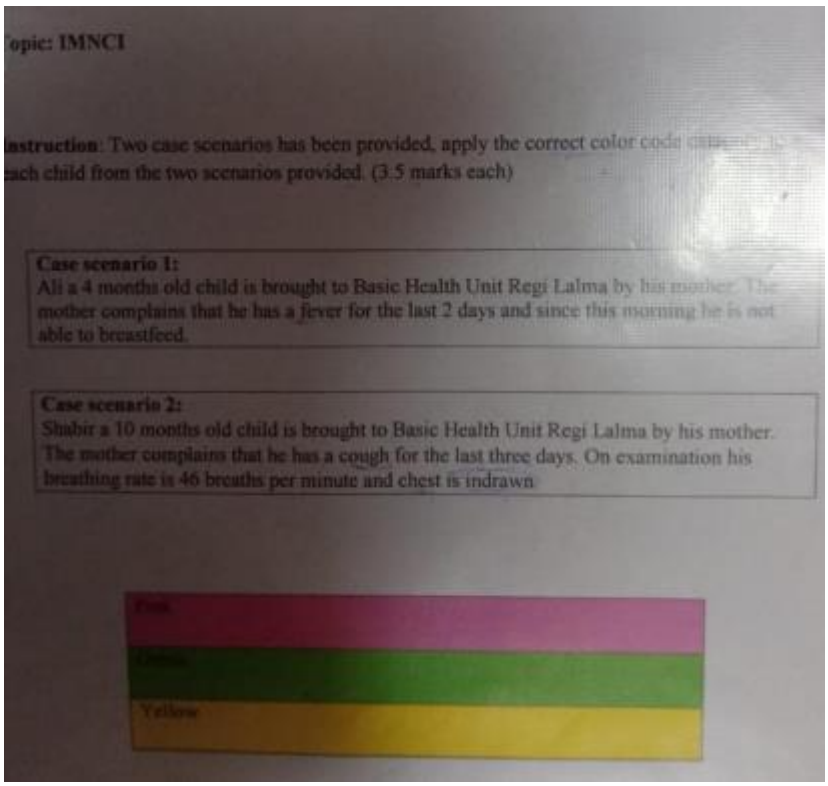




IMNCI Case Management Process

Classification based on a colour-coded triage system

Red – urgent pre-referral treatments and referral
Yellow – specific medical treatment and advice
Green – simple advice on home management



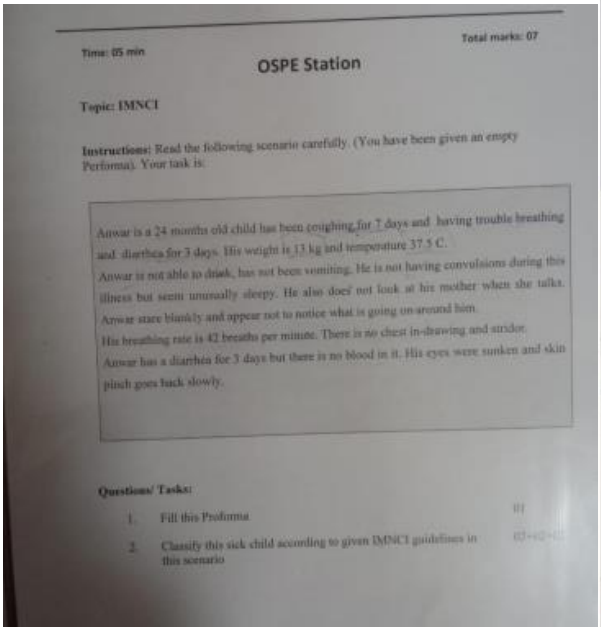
opic: IMNCI

structure: Two case scenarios has been provided, apply the correct color code
ach child from the two scenarios provided. (3.5 marks each)

Case scenario 1:
Ali a 4 months old child is brought to Basic Health Unit Regi Lalma by his mother. The mother complains that he has a fever for the last 2 days and since this morning he is not able to breastfeed.

Case scenario 2:
Shabir a 10 months old child is brought to Basic Health Unit Regi Lalma by his mother. The mother complains that he has a cough for the last three days. On examination his breathing rate is 46 breaths per minute and chest is indrawn.

Red
Green
Yellow



Time: 05 min

Total marks: 07

OSPE Station

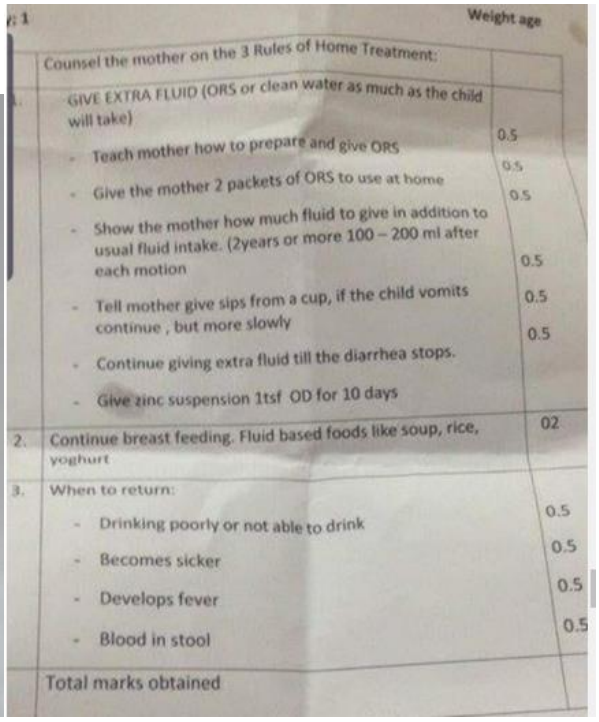
Topic: IMNCI

Instructions: Read the following scenario carefully. (You have been given an empty Performa). Your task is:

Anwar is a 24 months old child has been coughing for 7 days and having trouble breathing and diarrhea for 3 days. His weight is 13 kg and temperature 37.5 C.
Anwar is not able to drink, has not been vomiting. He is not having convulsions during this illness but seem unusually sleepy. He also does not look at his mother when she talks.
Anwar stare blankly and appear not to notice what is going on around him.
His breathing rate is 42 breaths per minute. There is no chest in-drawing and stridor.
Anwar has a diarrhea for 3 days but there is no blood in it. His eyes were sunken and skin pinch goes back slowly.

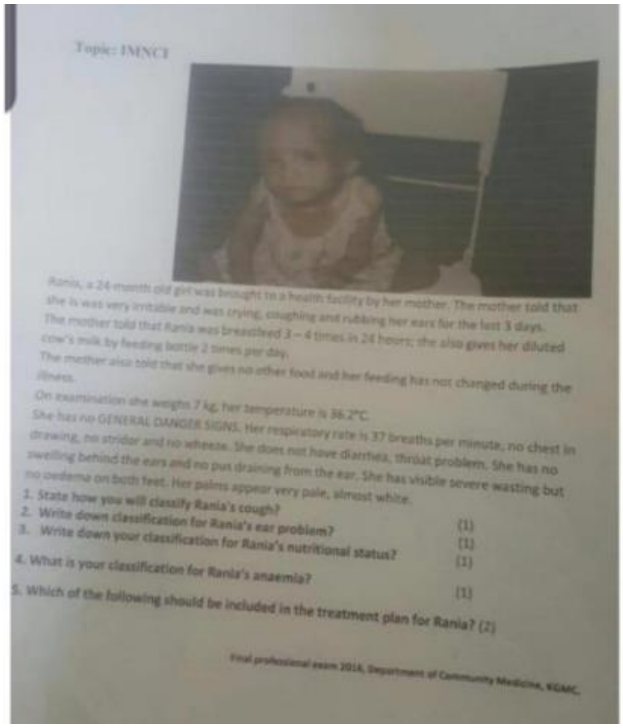
Questions/ Tasks:

1. Fill this Proforma
2. Classify this sick child according to given IMNCI guidelines in this scenario



	Weight age	
	Counsel the mother on the 3 Rules of Home Treatment:	
1.	GIVE EXTRA FLUID (ORS or clean water as much as the child will take)	
	- Teach mother how to prepare and give ORS	0.5
	- Give the mother 2 packets of ORS to use at home	0.5
	- Show the mother how much fluid to give in addition to usual fluid intake. (2years or more 100 – 200 ml after each motion	0.5
	- Tell mother give sips from a cup, if the child vomits continue , but more slowly	0.5
	- Continue giving extra fluid till the diarrhea stops.	0.5
	- Give zinc suspension 1tsf OD for 10 days	
2.	Continue breast feeding. Fluid based foods like soup, rice, yoghurt	02
3.	When to return:	
	- Drinking poorly or not able to drink	0.5
	- Becomes sicker	0.5
	- Develops fever	0.5
	- Blood in stool	0.5
	Total marks obtained	

DIAGNOSTIC SIGNS & TREATMENT OF ARI IN A CHILD AGED 2 MONTHS UP TO 5 YEARS				
Signs	• Not able to drink • Convulsions • Abnormally sleepy • Stridor in calm child • Severe malnutrition	Chest indrawing.	• No chest indrawing • No fast breathing	• No chest indrawing • No fast breathing
Classified as	Very severe Disease	Severe Pneumonia	Pneumonia	No pneumonia: Cough or cold
Treatment	• Refer urgently to hospital • Give first dose of an antibiotic • Treat fever • Treat wheezing	• Refer urgently to hospital • Give first dose of an antibiotic • Treat fever • Treat wheezing	• Advise mother to give home care • Give an antibiotic • Treat fever • Treat wheezing • Advise mother to return with child in 2 days for reassessment or earlier if child is getting worse (see below)	• If cough more than 30 days, refer for assessment of asthma, TB, whooping cough, etc • Assess and treat ear or throat problem, if present • Treat fever • Treat wheezing
REASSESS IN 2 DAYS A CHILD WHO IS TAKING AN ANTIBIOTIC FOR PNEUMONIA				
Signs	**Worsen** • Not able to drink • Has chest indrawing • Has other danger signs	**The Same**		**Improve** • Breathing slower • Less fever • Eating better
Treatment	Refer urgently to hospital.	Change antibiotic or refer.		Finish 5 days of antibiotic.



Topic: IMNCI

Rania, a 24-month old girl was brought to a health facility by her mother. The mother told that she is was very irritable and was crying, coughing and rubbing her ears for the last 3 days. The mother told that Rania was breastfeed 3 – 4 times in 24 hours; she also gives her diluted cow's milk by feeding bottle 2 times per day. The mother also told that she gives no other food and her feeding has not changed during the illness.

On examination she weighs 7 kg, her temperature is 36.2°C. She has no GENERAL DANGER SIGNS. Her respiratory rate is 37 breaths per minute, no chest in drawing, no stridor and no wheeze. She does not have diarrhea, thrüat problem. She has no swelling behind the ears and no pus draining from the ear. She has visible severe wasting but no oedema on both feet. Her palms appear very pale, almost white.

1. State how you will classify Rania's cough?
2. Write down classification for Rania's ear problem? (1)
3. Write down your classification for Rania's nutritional status? (1)
4. What is your classification for Rania's anaemia? (1)
5. Which of the following should be included in the treatment plan for Rania? (2)

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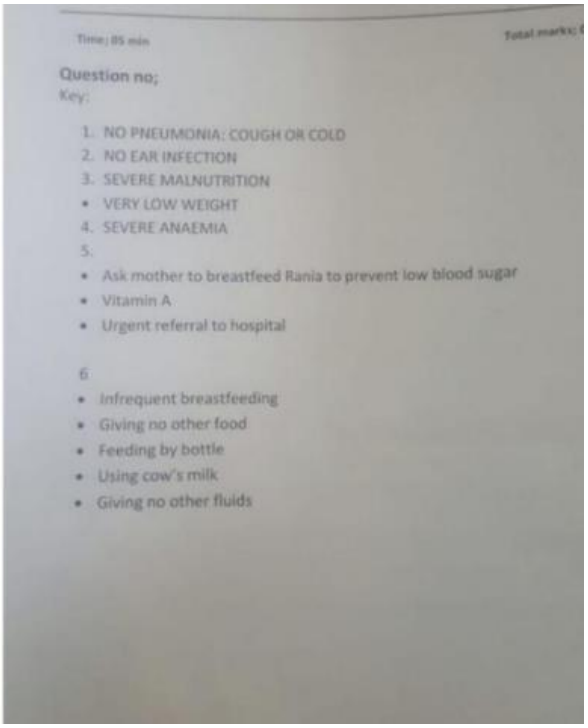


Time: 85 min

Question no;

Key:

1. NO PNEUMONIA: COUGH OR COLD
2. NO EAR INFECTION
3. SEVERE MALNUTRITION
   - VERY LOW WEIGHT
4. SEVERE ANAEMIA
5.
   - Ask mother to breastfeed Rania to prevent low blood sugar
   - Vitamin A
   - Urgent referral to hospital

6
- Infrequent breastfeeding
- Giving no other food
- Feeding by bottle
- Using cow's milk
- Giving no other fluids

DEMOGRAPHY: The study of the characteristics of human populations, such as size, growth, density, distribution, and vital statistics. OR The statistical science dealing with the distribution, density, vital statistics, etc. of human populations

Demographic processes:

- Fertility
- Mortality
- Composition
- Migration
- Social mobility

Census is defined as: "The total process of **collecting, compiling and publishing** demographic, economic and social **data** pertaining at a **specified time** or times to all persons in a country or delimited territory"

Uses:

- This data provides a frame of reference and base line for planning, action and research not only in the field of medicine, human ecology, and social sciences but in the entire governmental system

Methods used for censuses

- **De facto** – enumeration of individuals as of where they are found in the census, regardless of where they normally reside
- **De jure** - enumeration of individuals as of where they usually reside, regardless of where they are on census day

The **Demographic Transition Model (DTM)** is based on historical population trends of two demographic characteristics – birth rate and death rate.

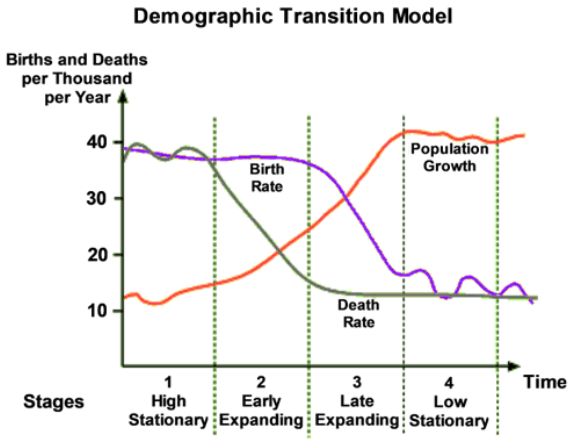
- It suggests that a country's total population growth rate cycles through stages as that country develops economically

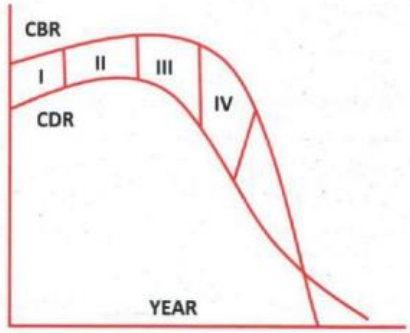
Balance: total population same over a period of time (high BR, high DR OR low BR, low DR)

Imbalance: total population increases over a period of time

Demographic Stages

1. **Stage 1: High Stationary**
    - High birth & death rates → No growth
    - Example: Pre-industrial societies
2. **Stage 2: Early Expanding**
    - High birth rate, falling death rate → Rapid growth
    - Example: Afghanistan
3. **Stage 3: Late Expanding**
    - Declining birth rate, low death rate → Slowing growth
    - Example: India
4. **Stage 4: Low Stationary**
    - Low birth & death rates → Stable population
    - Example: USA
5. **Stage 5: Declining**
    - Very low birth rate, low death rate → Population decline
    - Example: Japan





Population momentum: refers to population growth or decline, which continues despite the falling or rising birth or fertility rate. It naturally occurs towards the end of stage 3 of demographic transition

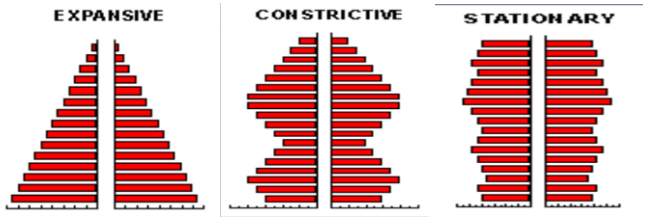
- Positive Population momentum is the propensity for a growing population to continue growing even through fertility or birth rate is declining
- Negative momentum is the tendency for a population to continue to fall despite a rise in birth rate

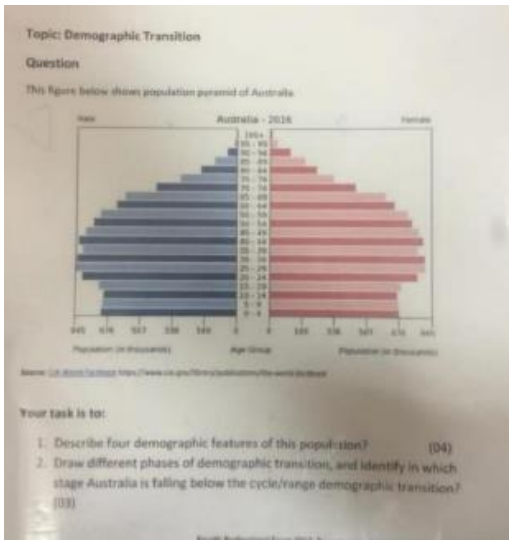
Population pyramid: The age-sex composition of a population is typically represented by a population pyramid which provides a demographic statement of the current age and sex distribution of a population. The youngs are always at the bottom and the old at the top

Types:

- Stable

- Expansive
- Constrictive
- Stationary




Topic: Demographic Transition

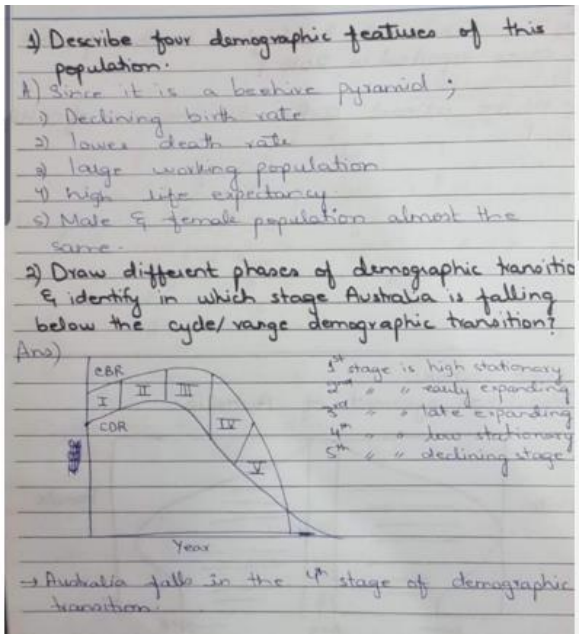
Question

This figure below shows population pyramid of Australia

Australia - 2016

Your task is to:

1. Describe four demographic features of this population? (04)
2. Draw different phases of demographic transition, and identify in which stage Australia is falling below the cycle/range demographic transition? (03)


1) Describe four demographic features of this population.

A) Since it is a beehive pyramid;
1) Declining birth rate
2) lower death rate
3) large working population
4) high life expectancy
5) Male & female population almost the same.

2) Draw different phases of demographic transitio & identify in which stage Australia is falling below the cycle/ range demographic transition?

Ans)

→ Australia falls in the 4th stage of demographic transition.

Dependency ratio is an index summarizing an age distribution.

Sex Ratio= number of males ×100

number of females

Sex Ratio

- **Definition:** The ratio of males to females in a population, usually expressed as the number of males per 100 females.
- **Formula:**

$$\text{Sex Ratio} = \left(\frac{\text{Number of Males}}{\text{Number of Females}} \right) \times 100$$

Factors Affecting Sex Ratio:

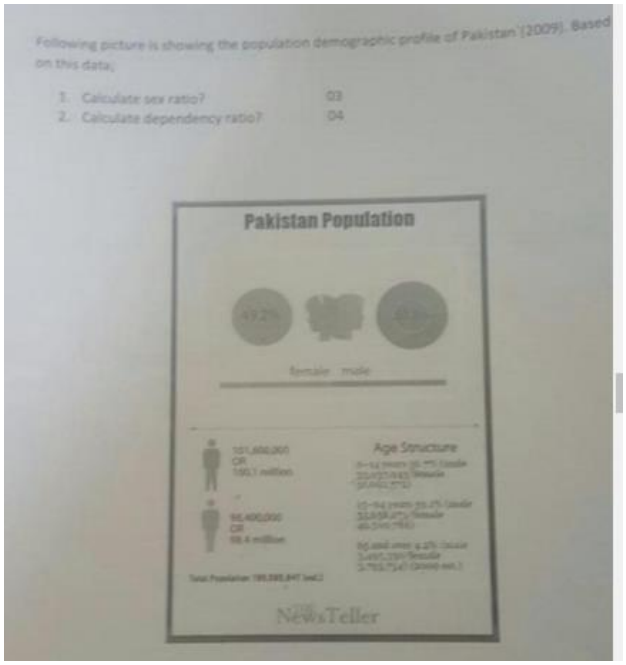
- Biological (higher male birth rate)
- Migration
- Social and cultural preferences (e.g., gender-based abortion)
- Mortality rates (higher in males)

Dependency Ratio

Definition: The ratio of dependents (people younger than 15 and older than 64) to the working-age population (15–64 years). It indicates the burden on the productive population.

Formula:

$$\text{Dependency Ratio} = \left(\frac{\text{Population under 15} + \text{Population over 64}}{\text{Population aged 15–64}} \right) \times 100$$



General Fertility Rate (GFR) Formula:

$$\text{GFR} = \left(\frac{\text{Total Number of Live Births}}{\text{Women Aged 15–49 Years}} \right) \times 1,000$$

Explanation:

- Measures the number of live births per 1,000 women of reproductive age (15–49 years).
- It is a more accurate fertility indicator compared to crude birth rate because it focuses on women who can give birth.

Population Growth Rate Formula:

$$\text{Growth Rate (\%)} = \left(\frac{\text{Births} - \text{Deaths} + \text{Net Migration}}{\text{Total Population}} \right) \times 100$$

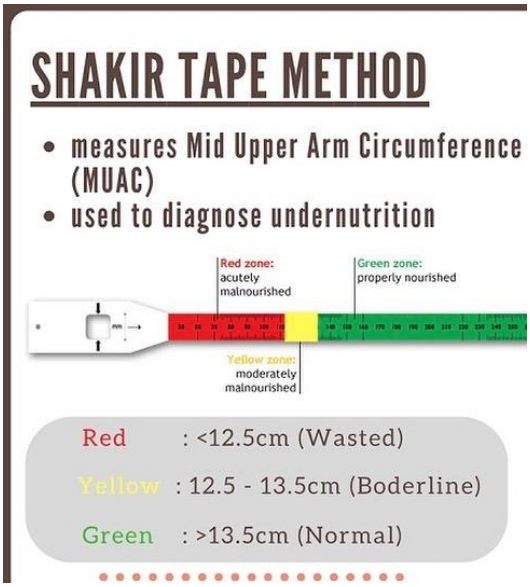
Simplified Formula (if natural increase only):

$$\text{Growth Rate (\%)} = \left(\frac{\text{Birth Rate} - \text{Death Rate}}{10} \right)$$

Where birth and death rates are expressed per 1,000 population.

SHAKIR TAPE

MUAC- mid upper arm circumference tapes used to measure UAC of children and pregnant women, identify malnutrition. Assesses nutritional status. Predicts MORTALITY



Prepare the patient:

- Ensure the patient's arm is relaxed and hanging down by their side or bent at a 90° angle.

Identify the measurement point:

- Find the midpoint between the shoulder (acromion process) and the elbow (olecranon process) on the **left arm**.

Position the tape:

- Wrap a flexible, non-stretch MUAC measuring tape around the mid-point of the upper arm (found in step 2), ensuring the tape is snug but not tight.

Read the measurement:

- Ensure the tape is level around the arm without compressing the skin or muscle.
- Record the measurement to the nearest **0.1 cm**.

Anthropometric indices include:

- Weight for age (Wt/Age)
- Height for age (Ht/Age)
- Weight for height (Wt/Ht)

There are a few key parameters that healthcare professionals look at:

1. Height: This is measured using a stadiometer to track a child's growth in terms of their height.
2. Weight: A scale is used to measure a child's weight, which can indicate if they are growing at a healthy rate.
3. Head circumference: This measurement helps assess brain development and is typically monitored in infants and young children.

Stages of Obesity (Based on BMI and health risk):

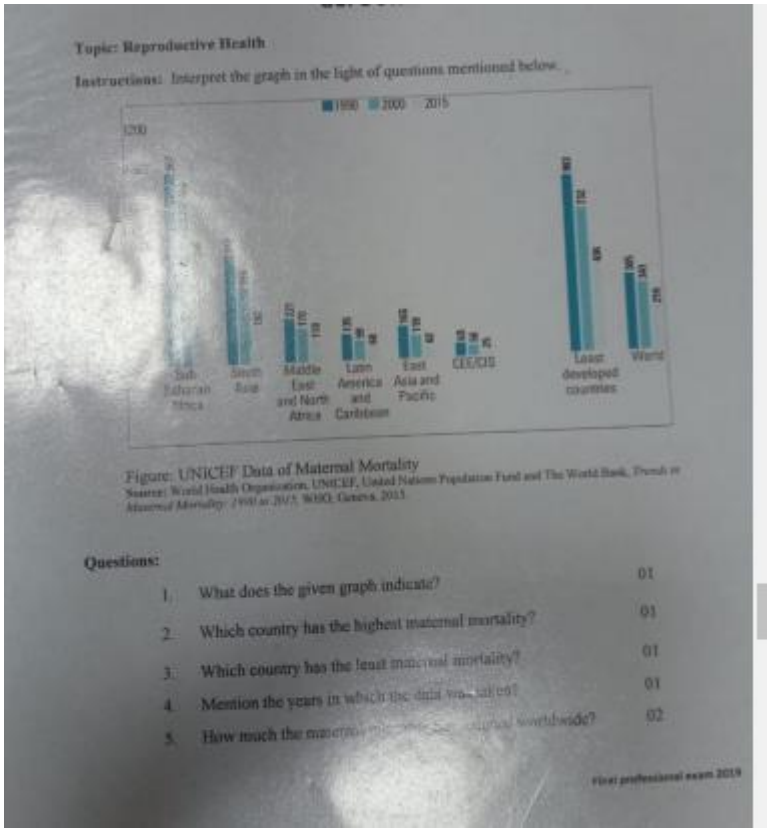
1. **Overweight (Pre-obesity)**: BMI 25–29.9 kg/m²
   - Increased risk of metabolic disorders.
2. **Obesity Class I (Mild)**: BMI 30–34.9 kg/m²
   - Moderate health risk (hypertension, diabetes).
3. **Obesity Class II (Moderate)**: BMI 35–39.9 kg/m²

- High risk of cardiovascular disease and other complications.

4. **Obesity Class III (Severe/Morbid)**: BMI ≥ 40 kg/m²
    - Severe health risks, life-threatening conditions.

Syphilis is a sexually transmitted infection caused by the bacteria Treponema pallidum. Here are some common symptoms of syphilis:

1. Primary stage: A painless sore called a chancre appears at the site of infection.
2. Secondary stage: A rash may develop on the body, along with flu-like symptoms.
3. Latent stage: The infection remains dormant with no visible symptoms.
4. Tertiary stage: If left untreated, syphilis can cause severe complications, including damage to the heart, brain,



Topic: Reproductive Health

Instructions: Interpret the graph in the light of questions mentioned below.

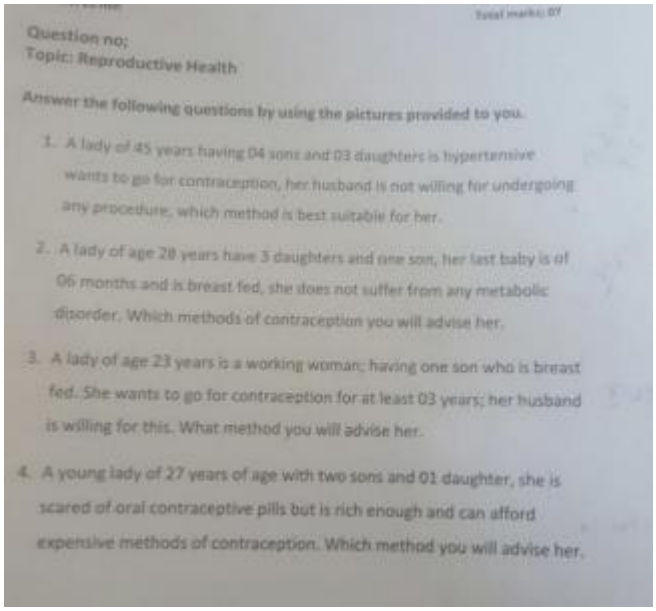
Figure: UNICEF Data of Maternal Mortality

Source: World Health Organization, UNICEF, United Nations Population Fund and The World Bank, Trends in Maternal Mortality: 1990 to 2015, WHO, Geneva, 2015.

Questions:

1. What does the given graph indicate? 01
2. Which country has the highest maternal mortality? 01
3. Which country has the least maternal mortality? 01
4. Mention the years in which the data was taken? 01
5. How much the maternal [illegible] worldwide? 02

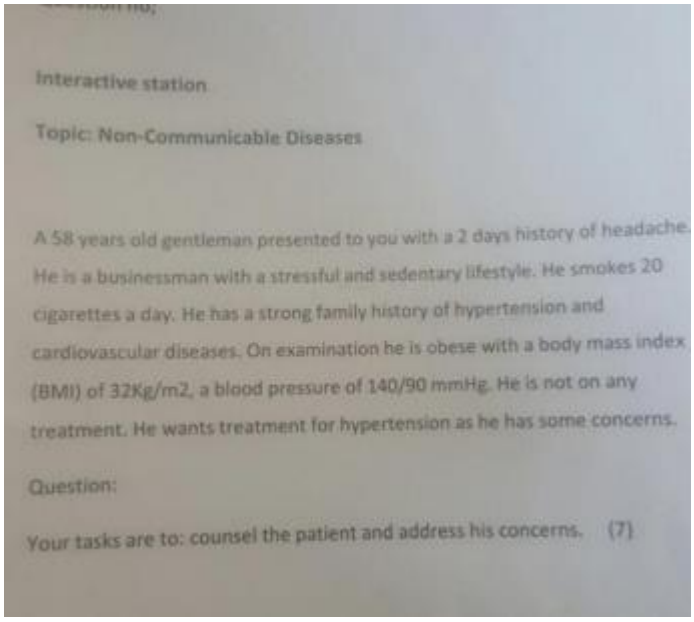
Final professional exam 2019



Question no;
Topic: Reproductive Health

Answer the following questions by using the pictures provided to you.

1. A lady of 45 years having 04 sons and 03 daughters is hypertensive wants to go for contraception, her husband is not willing for undergoing any procedure, which method is best suitable for her.
2. A lady of age 28 years have 3 daughters and one son, her last baby is of 06 months and is breast fed, she does not suffer from any metabolic disorder. Which methods of contraception you will advise her.
3. A lady of age 23 years is a working woman; having one son who is breast fed. She wants to go for contraception for at least 03 years; her husband is willing for this. What method you will advise her.
4. A young lady of 27 years of age with two sons and 01 daughter, she is scared of oral contraceptive pills but is rich enough and can afford expensive methods of contraception. Which method you will advise her.



Interactive station

Topic: Non-Communicable Diseases

A 58 years old gentleman presented to you with a 2 days history of headache. He is a businessman with a stressful and sedentary lifestyle. He smokes 20 cigarettes a day. He has a strong family history of hypertension and cardiovascular diseases. On examination he is obese with a body mass index (BMI) of 32Kg/m2, a blood pressure of 140/90 mmHg. He is not on any treatment. He wants treatment for hypertension as he has some concerns.

Question:

Your tasks are to: counsel the patient and address his concerns. (7)

Insect Vectors and the Diseases They Transmit

Insect Vector	Disease(s)	Causative Agent
Mosquito (Anopheles)	Malaria	*Plasmodium* species
Mosquito (Aedes)	Dengue, Zika, Chikungunya	*Flavivirus* family
Mosquito (Culex)	West Nile Fever, Filariasis	*West Nile virus*, *Wuchereria*
Tsetse Fly	Sleeping Sickness (African Trypanosomiasis)	*Trypanosoma brucei*
Sandfly	Leishmaniasis	*Leishmania* species
Blackfly	Onchocerciasis (River Blindness)	*Onchocerca volvulus*
Flea	Plague	*Yersinia pestis*
Louse	Epidemic Typhus	*Rickettsia prowazekii*
Tick	Lyme Disease, Rocky Mountain Spotted Fever	*Borrelia*, *Rickettsia*

Causes of Iodine Deficiency

1. Low dietary intake of iodine.
2. Living in iodine-deficient areas (mountainous regions, inland areas).
3. Consumption of goitrogens (cabbage, cauliflower, cassava).
4. Pregnancy and lactation (increased iodine requirement).
5. Poor salt iodization practices.

Prevention

1. Use iodized salt in daily diet.
2. Consume iodine-rich foods (fish, seaweed, dairy).
3. Regular screening in high-risk populations (pregnant women, children).
4. Public health education on iodine deficiency disorders (IDD).

Sources of Iodine

1. **Seafood** (fish, shrimp, seaweed)
2. **Dairy Products** (milk, yogurt, cheese)
3. **Eggs**
4. **Iodized Salt**
5. **Fruits and Vegetables** (grown in iodine-rich soil)

Macronutrients

1. **Carbohydrates** – Primary energy source (e.g., bread, rice, fruits)
2. **Proteins** – Growth, repair, enzymes (e.g., meat, beans, eggs)
3. **Fats** – Energy storage, cell membranes (e.g., oils, nuts, fish)
4. **Water** – Hydration, metabolic processes

some essential micronutrients:

1. Vitamin A
2. Vitamin B complex (B1, B2, B3, B5, B6, B7, B9, B12)
3. Vitamin C
4. Vitamin D
5. Vitamin E
6. Vitamin K
7. Iron
8. Calcium
9. Magnesium
10. Zinc

Bitot's Spot & Vitamin A Deficiency

Bitot's Spot: Foamy, white patches on the conjunctiva due to **Vitamin A deficiency**, commonly seen in malnourished children.

Prevention of Vitamin A Deficiency in Children

- **< 6 months**: 50,000 IU
- **6–12 months**: 100,000 IU
- **> 1 year**: 200,000 IU

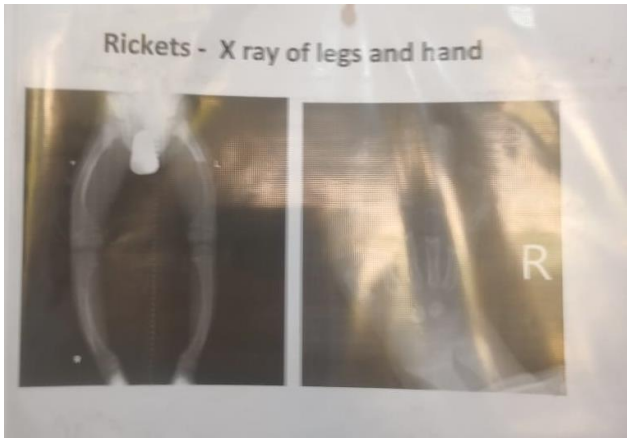
Given every **4–6 months** as supplementation in high-risk children.

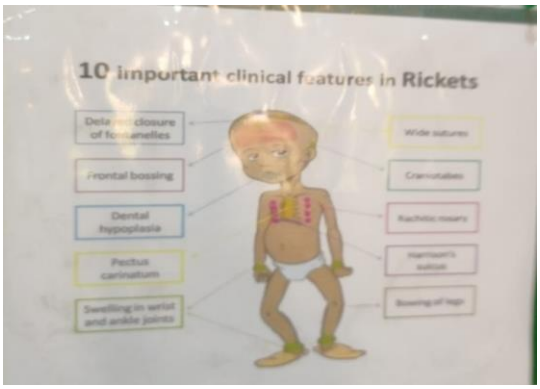
Important Sources of Vitamin K

1. **Green Leafy Vegetables**: Spinach, kale, broccoli
2. **Vegetable Oils**: Soybean oil, canola oil
3. **Liver and Eggs**
4. **Fermented Foods**: Natto (fermented soybeans)
5. **Gut Bacteria Production** (Vitamin K2)

Role of Vitamin K

1. **Blood Clotting**: Essential for synthesis of clotting factors (II, VII, IX, X). Prevents excessive bleeding.
2. **Bone Health**: Helps in calcium binding to bones, improving bone density and reducing fractures.
3. **Cardiovascular Health**: Prevents calcification of arteries, reducing the risk of heart disease.
4. **Regulates Cell Growth**: Important for preventing abnormal cell growth.

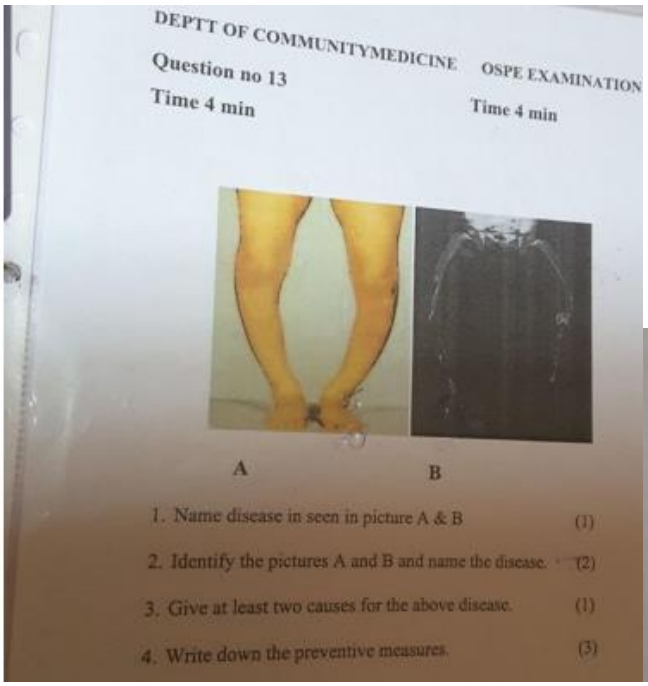




Important Features of Rickets (High-Yield)

- **Bone Deformities**: Bowed legs (genu varum), knock knees (genu valgum)
- **Delayed Growth**
- **Widened Epiphyses** (wrists and ankles)
- **Craniotabes**: Soft skull bones
- **Rachitic Rosary**: Prominent costochondral junctions
- **Harrison's Groove**: Indentation along the lower rib cage
- **Muscle Weakness**
- **Delayed Teeth Eruption**

Cause: **Vitamin D deficiency** → Impaired calcium/phosphate absorption.

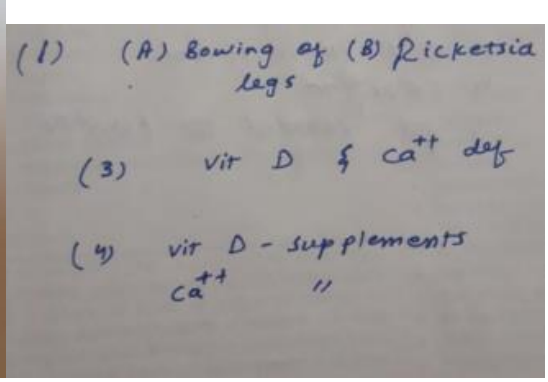

DEPTT OF COMMUNITYMEDICINE OSPE EXAMINATION

Question no 13 Time 4 min

Time 4 min

A B

1. Name disease in seen in picture A & B (1)
2. Identify the pictures A and B and name the disease. (2)
3. Give at least two causes for the above disease. (1)
4. Write down the preventive measures. (3)


(1) (A) Bowing of legs (B) Ricketsia

(3) vit D & ca^{++} def

(4) vit D - supplements

ca^{++} "

VITAMINS			
NAME OF VITAMIN	**FUNCTION**	**SOURCES**	**DEFICIENCY DISEASES**
Fat Soluble			
Vitamin A (2000 IU) (IU = International Units)	Promotes growth and improves resistance to bacterial infections, necessary for vision and normal epithelium.	Animal sources: Milk, butter, cream, ghee, egg yolk, liver, fish. Plant sources: Green leafy vegetables, tomatoes, carrots, etc.	• Retardation of growth of children and lowering of body resistance • Xerophthalmia, night blindness and keratomalacia • Degeneration of myelin sheath of nerves
Vitamin D (200 IU)	Calcification of bones and teeth.	Milk, butter, egg yolk, fish, oil, ghee, (animal fats, exposure of the skin to sun rays.	• Rickets in children ✓ Pot belly ✓ Bowing of legs • Osteomalacia in adults
Vitamin E (0.2gm)	Necessary for pregnancy.	Green leafy vegetables, wheat, maize, oats, beans, pulses and cereals.	• Sterility in animals but never directly implicated in man • Threatened abortions in females
Vitamin K (1000 IU)	Helps coagulation of blood.	Cabbage, cauliflower, soya-beans, milk and eggs.	• Delayed coagulation time and profuse bleeding on slight injury
Water Soluble			
Vitamin B1 (Thiamine) (1-3mg)	A coenzyme in carbohydrate metabolism.	Legumes, nuts, whole grain flour and oatmeal.	• Polyneuritis or Beriberi • Loss of appetite, depression, exhaustion and fatigue • Carbohydrate metabolism is disturbed, pyruvic acid accumulates in the blood
Vitamin B2 (Riboflavin) (3mg)	Forms part of several enzyme systems.	Liver, leafy vegetables, cheese, eggs and milk.	• Lip cracks at the corner of mouth • Soreness and cracks of the tongue • Redness of the eyes
Vitamin B3 (Niacin) (10mg)	Pellagra preventive.	Lever, meat, poultry, fish, peanuts and dried yeast.	• Pellagra (3Ds): Diarrhea, dermatitis, dementia
Vitamin B6 (Pyridoxine) (1.5-2mg)	A coenzyme in the metabolism of amino acids.	Liver, wheat, yeast and legumes.	• Nervousness • Irritability • Weakness and difficulty in walking • Convulsive seizures in infants • Burning feet syndrome
Vitamin B12 (Cobalamin) (3-5mg)	It participates in haematopiesis, in nucleic acid synthesis, thyroid activity and ascorbic acid metabolism.	Liver, kidney, brain and heart.	• Improper haematopoiesis causing anemia called megaloblastic anemia/ pernicious anemia
Vitamin C (Ascorbic Acid) [50mg (600IU)]	1. Promotes and helps in maturation of RBCs and WBCs. 2. Regulates calcium metabolism 3. Helps in healing of wounds.	Fresh uncooked green leafy vegetables, fresh fruit juices, cabbage, turnips, orange, lemon, guava, tomatoes, sprouted pulses and germinating grains.	• Scurvy: bleeding and retraction of gums • Tendency to hemorrhage from skin capillaries • Dental caries • Anemia and loss of appetite • Delaying of wound healing

Topic: Nutrition

Mr. Khalid is a bank manager who visits a nutritionist because he is concerned about his physical health. His mother has recently passed away of heart disease. On enquiring about his daily habits Mr. Khalid explained that he spent most of his watching television and using a mobile phone/computer for much of the day. He loves to eat fried foods, sweets, dessert, and fizzy drinks and very little vegetables and fruits. He is a smoker and has been smoking for the last 6 years. His height is 1.60 meter & weight is 80 Kg.

a. Calculate body mass index (BMI) of Mr. Khalid. (02)
b. Interpret the result. (01)
c. Devise a healthy lifestyle plan for Mr. Khalid using healthy food pyramid as reference. (04)

	Food groups & personal habits	Quantity Per day	Recommendations
1.	Grain		
2.	Vegetables		
3.	Fruits		
4.	Milk		
5.	Meat and beans		
6.	Oils/ fat		
7.	Sugar and sweets		
8.	Salts		
9.	Exercise		
10.	Smoking		

DIFFERENCES BETWEENKOPLIK'S SPOT & BITOT'S SPOT	
KOPLIK'S SPOT	**BITOT'S SPOT**
1. Its cause is measles. 2. It occurs on buccal mucosa opposite the first and second upper molars. 3. It is small, bluish white spot on a red base, smaller than head of a pin. 4. It appears a day or two before rash. 	1. Its cause is vitamin A deficiency. 2. It occurs on bulbar conjunctiva on either side of the cornea. Frequently they are bilateral. 3. It is pearly white or yellowish, triangular and foamy spot. 

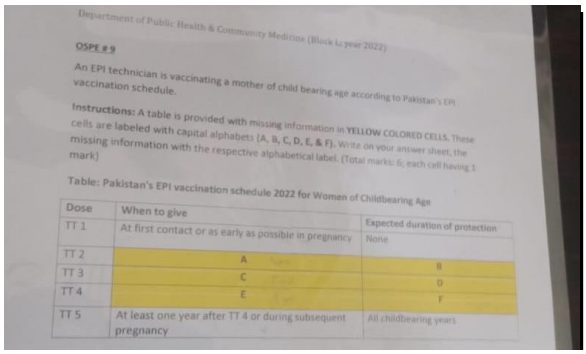
DIFFERENCES BETWEEN DEFINITIVE & INTERMEDIATE HOST	
DEFINITE HOST	**INTERMEDIATE HOST**
1. Also called primary host. 2. It is the host in which sexual cycle of agent occurs. 3. Definite host is one in which the disease can spread from one to another. 4. Example: Mosquito is a definite host in case of malarial parasite.	1. Also known as secondary host. 2. It is the host in which asexual part of life cycle of the agent occurs. 3. In this case, disease spreads and also the agent passes passively. 4. Example: Mosquito in filariasis and Cyclops in guinea worm disease is intermediate host.

DIFFERENCES BETWEEN ISOLATION & QUARANTINE	
ISOLATION	**QUARANTINE**
Definition: Separation for the period of communicability of infected person or animal from others in such a place and under such conditions so as to prevent or limit the direct or indirect transmission of infectious agent from those infected to those who are susceptible or may spread to others. **2. Purpose:** To protect those who are not diseased **3. Duration:**	**Definition:** The limitation of freedom of movement of such well person or domestic animals exposed to communicable disease for a period of time not longer than the longest usual incubation period of the disease, in such a manner as to prevent effective contact with those not so exposed. **2. Purpose:** To limit freedom of well person so that they do not get exposed.

- **Street virus**= recovered from naturally occuring cases of rabies
- **Fixed virus**= virus has short, fixed and reproducible incubation period
- **Souce of infection**= the person, animal, obect or substance from which and infectionus afgent passes or disseminated to the host.
- **SOURCE OF RESERVOIR**= Any person, animal, arthropod or substance in which an infectious agent lives & multiplies and upon which agent depends primarily for survival and where it reproduces itself in such a manner that it can be transmitted to susceptible host, 2, Reservoir is of three types: • Human reservoir • Animal reservoir • Non-living reservoir

STDs EXCLUSIVELY TRANSMITTED BY SEXUAL CONTACT	
CAUSAL AGENT	**DISEASE**
A. Viral:	
• HIV-1, HIV-2	AIDS
• HSV-1, HSV-2	Herpes Lesions
• Papilloma Virus	Condyloma and cervical neoplasm
B. Chlamydial, Mycoplasma:	
• Chlamydia trachomatis (L-type)	Lymphogranulomavenereum
• Chlamydia trachomatis	Nongonorrheal urethritis, cervicitis
• Ureaplasmaurealyticum	Nongonorrheal urethritis, cervicitis
C. Bacterial:	
• Neisseria gonorrhoeae	Gonorrhea
• Treponemapallidum	Syphilis
D. Protozoal:	
• Trichomonasvaginalis	Trichomoniasis
E. Arthropod:	
• Phthirus pubis	Pediculosis pubis (crabs)

STD'S TRANSMITTED SEXUALLY OR BY OTHER MEANS	
CAUSAL AGENT	**DISEASE**
A. Viral:	
• HBV	Hepatitis B
• EBV	Warts
B. Bacterial:	
• Group B Streptococci	Neonatal sepsis, cystitis
• Gram Negative Bacilli	
C. Fungal:	
• Candida	Thrush, vaginitis.
D. Protozoal:	
• E. Histolytica	Colitis, liver abscess



Department of Public Health & Community Medicine (Block L; year 2022)

OSPE # 9

An EPI technician is vaccinating a mother of child bearing age according to Pakistan's EPI vaccination schedule.

Instructions: A table is provided with missing information in YELLOW COLORED CELLS. These cells are labeled with capital alphabets (A, B, C, D, E, & F). Write on your answer sheet, the missing information with the respective alphabetical label. (Total marks: 6, each cell having 1 mark)

Table: Pakistan's EPI vaccination schedule 2022 for Women of Childbearing Age

Dose	When to give	Expected duration of protection
TT 1	At first contact or as early as possible in pregnancy	None
TT 2	A	B
TT 3	C	D
TT 4	E	F
TT 5	At least one year after TT 4 or during subsequent pregnancy	All childbearing years

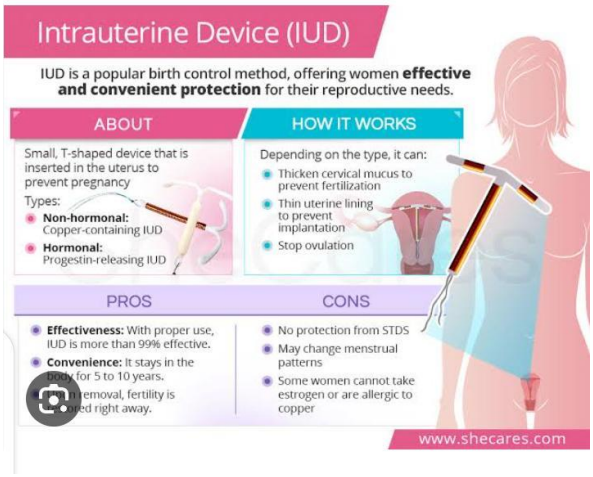
Schedule of administration of Tetanus Toxoid

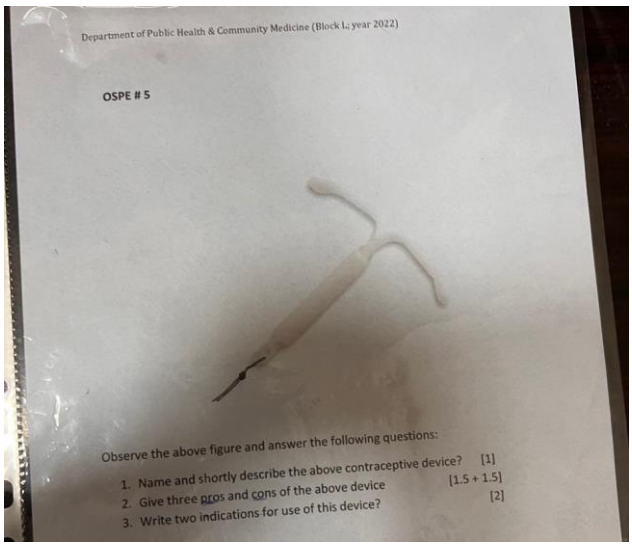
for women of childbearing age

Dose	When to give	Expected duration of protection
TT 1	at first contact or as early as possible in pregnancy	none
TT 2	at least 4 weeks after TT 1	1 - 3 years
TT 3	at least 6 months after TT 2	5 years
TT 4	at least one year after TT 3 or during subsequent pregnancy	10 years
TT 5	at least one year after TT 4 or during subsequent pregnancy	All childbearing years

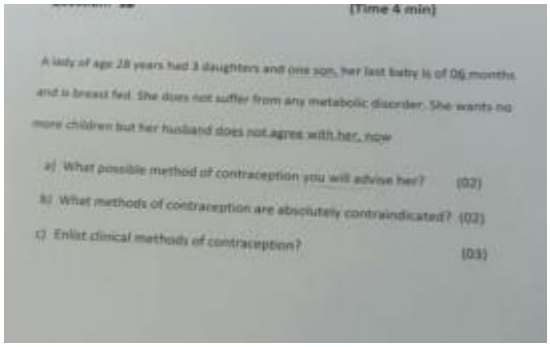
Indications for Contraception:

1. Family planning
2. Preventing unintended pregnancies
3. Medical reasons
4. Protecting against STIs
5. Personal choice





1. **Name and description:**
   - **Device:** Intrauterine Device (IUD)
   - **Description:** A small, T-shaped contraceptive device inserted into the uterus to prevent pregnancy. It can be hormonal or non-hormonal (copper).
2. **Three pros and cons:**
   - **Pros:**
     - Long-lasting contraception (up to 5–10 years)
     - Highly effective (>99%)
     - No daily maintenance required
   - **Cons:**
     - May cause heavier or irregular periods (especially with copper IUDs)
     - Risk of uterine perforation during insertion
     - Increased risk of pelvic inflammatory disease (PID) if inserted in the presence of infection
3. **Two indications for use:**
   - Long-term contraception
   - Emergency contraception (Copper IUD within 5 days of unprotected sex)

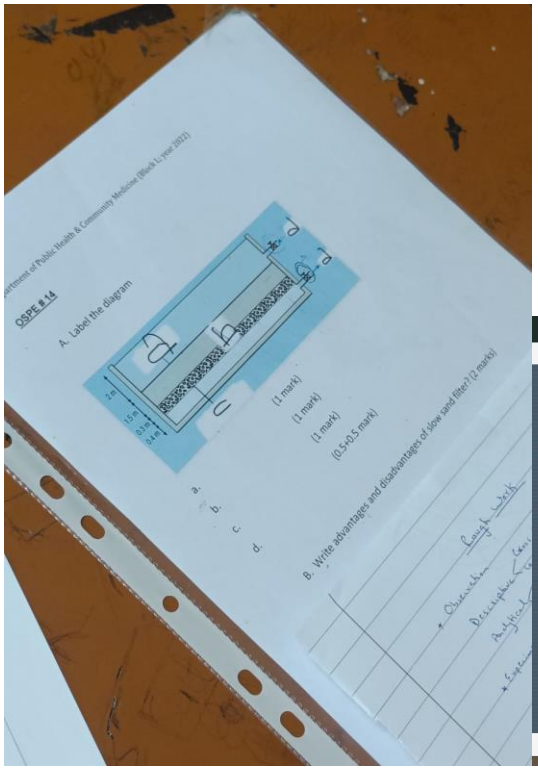

(Time 4 min)

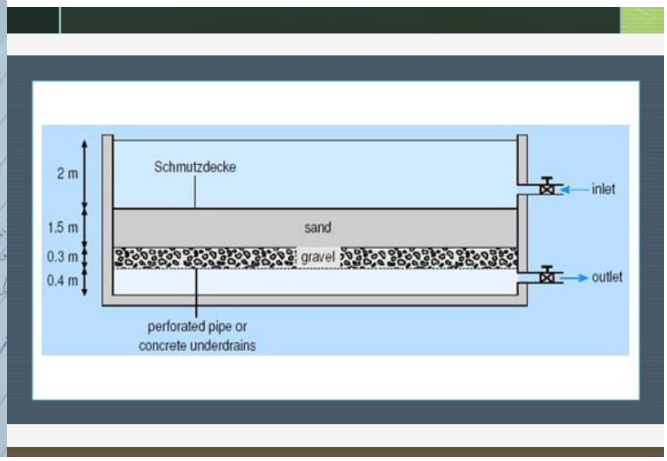
A lady of age 28 years had 3 daughters and one son, her last baby is of 06 months and is breast fed. She does not suffer from any metabolic disorder. She wants no more children but her husband does not agree with her, now

a) What possible method of contraception you will advise her? (02)

b) What methods of contraception are absolutely contraindicated? (02)

c) Enlist clinical methods of contraception? (03)





- **D1= raw water**
- **D2= waste water**
- **A=supernatant layer (acts as biological filter)**
- **B= sand bed**
- **C= perforated pipe**

Advantages and Disadvantages of Sand Filters:

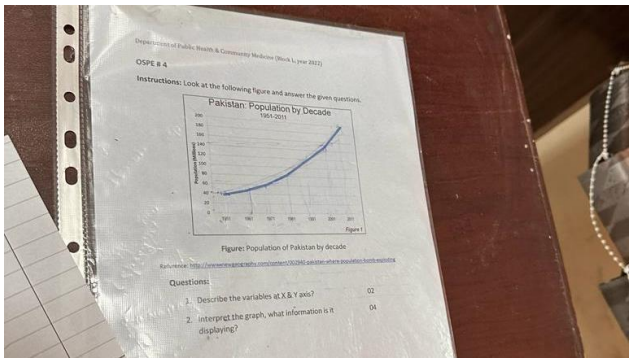
Advantages:

- Removes suspended solids and pathogens
- Low-cost and eco-friendly
- Easy to operate and maintain

Disadvantages:

- Frequent backwashing required

- Not effective for chemical contamination
- Takes up considerable space



The graph shows the **population growth trend of Pakistan in decades**. The y-axis represents the population size (in millions or other units), while the x-axis marks different decades.

Benefits of Breastfeeding (High-Yield Points)

For Baby:

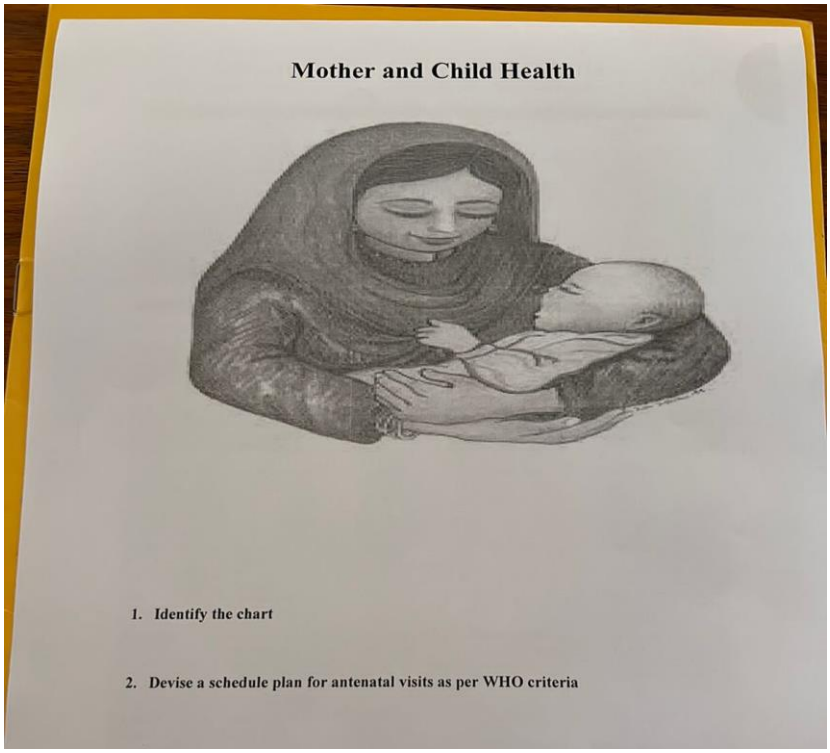
- **Nutrition:** Ideal balance of nutrients for growth and development.
- **Immunity:** Provides antibodies (IgA) that protect against infections.
- **Reduced Risk:**
    - Fewer respiratory and ear infections
    - Decreased risk of allergies, asthma, and obesity
    - Lower risk of sudden infant death syndrome (SIDS)

For Mother:

- **Uterine Involution:** Promotes faster return of the uterus to pre-pregnancy size.
- **Reduced Postpartum Bleeding**
- **Weight Loss:** Helps burn extra calories.
- **Protection Against Diseases:**
    - Reduced risk of breast and ovarian cancer
    - Lower risk of type 2 diabetes and osteoporosis

For Society:

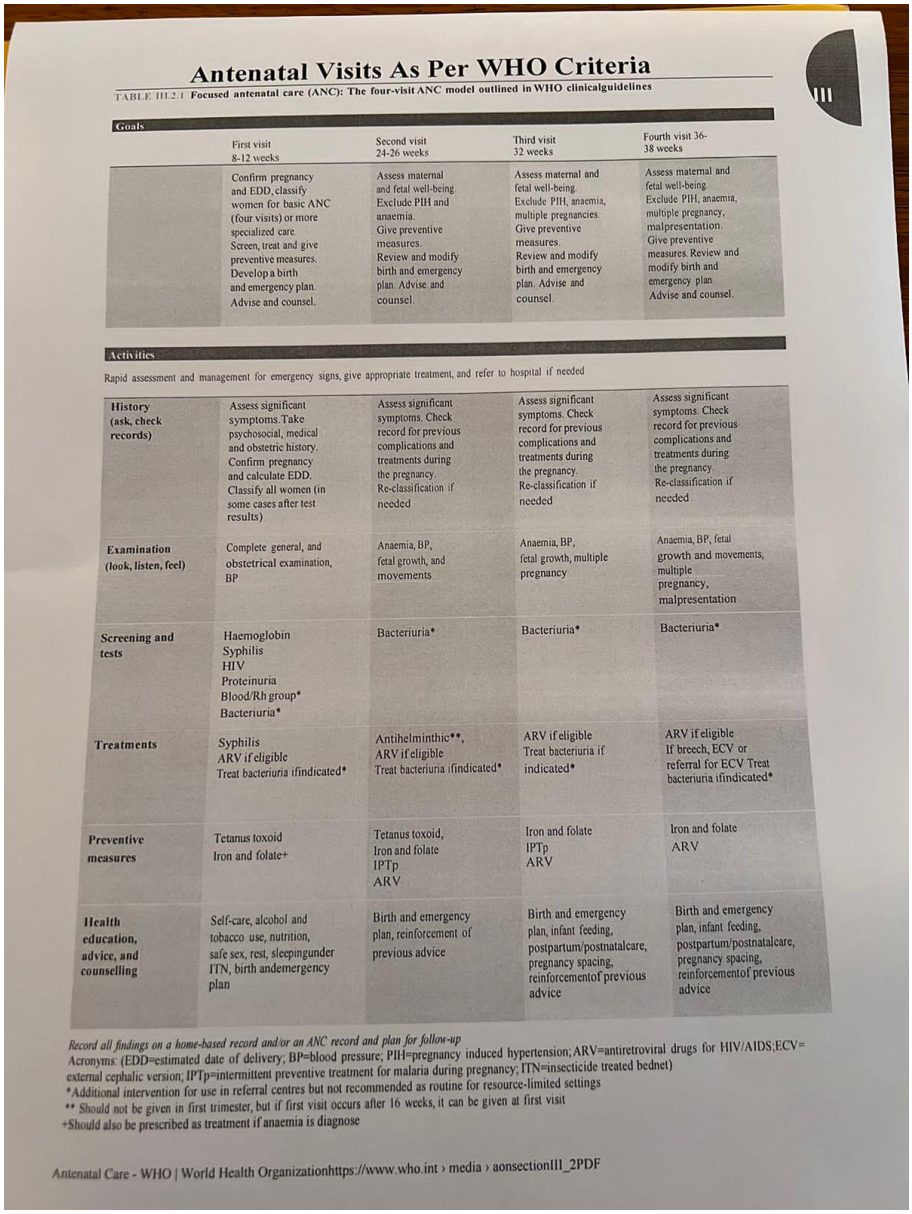
- **Cost-effective:** Reduces healthcare costs and need for formula.
- **Environmentally Friendly:** No waste or packaging required.



1. **Identify the chart:**
   This image represents **Mother and Child Health**, symbolizing **maternal care and neonatal health**.
2. **Schedule Plan for Antenatal Visits as per WHO criteria:**
   According to WHO, a minimum of **4 antenatal visits** is recommended:
   - **1st visit:** Before 8-12 weeks
   - **2nd visit:** 24-26 weeks
   - **3rd visit:** 26-32 weeks
   - **4th visit:** 36-38 weeks

Key Vaccines in Pregnancy:

1. **Tetanus Toxoid (TT)** – Prevents neonatal and maternal tetanus.
2. **Influenza Vaccine** – Given during flu season to prevent complications.
3. **COVID-19 Vaccine** – Recommended as per country guidelines.
4. **Pertussis (Tdap)** – Given between 27–36 weeks to protect against whooping cough.



Antenatal Visits As Per WHO Criteria

TABLE III.2.1 **Focused antenatal care (ANC): The four-visit ANC model outlined in WHO clinicalguidelines**

	First visit 8-12 weeks	Second visit 24-26 weeks	Third visit 32 weeks	Fourth visit 36-38 weeks
Goals	Confirm pregnancy and EDD, classify women for basic ANC (four visits) or more specialized care. Screen, treat and give preventive measures. Develop a birth and emergency plan. Advise and counsel.	Assess maternal and fetal well-being. Exclude PIH and anaemia. Give preventive measures. Review and modify birth and emergency plan. Advise and counsel.	Assess maternal and fetal well-being. Exclude PIH, anaemia, multiple pregnancies. Give preventive measures. Review and modify birth and emergency plan. Advise and counsel.	Assess maternal and fetal well-being. Exclude PIH, anaemia, multiple pregnancy, malpresentation. Give preventive measures. Review and modify birth and emergency plan. Advise and counsel.
Activities	Rapid assessment and management for emergency signs, give appropriate treatment, and refer to hospital if needed			
History (ask, check records)	Assess significant symptoms. Take psychosocial, medical and obstetric history. Confirm pregnancy and calculate EDD. Classify all women (in some cases after test results)	Assess significant symptoms. Check record for previous complications and treatments during the pregnancy. Re-classification if needed	Assess significant symptoms. Check record for previous complications and treatments during the pregnancy. Re-classification if needed	Assess significant symptoms. Check record for previous complications and treatments during the pregnancy. Re-classification if needed
Examination (look, listen, feel)	Complete general, and obstetrical examination, BP	Anaemia, BP, fetal growth, and movements	Anaemia, BP, fetal growth, multiple pregnancy	Anaemia, BP, fetal growth and movements, multiple pregnancy, malpresentation
Screening and tests	Haemoglobin Syphilis HIV Proteinuria Blood/Rh group* Bacteriuria*	Bacteriuria*	Bacteriuria*	Bacteriuria*
Treatments	Syphilis ARV if eligible Treat bacteriuria ifindicated*	Antihelminthic**, ARV if eligible Treat bacteriuria ifindicated*	ARV if eligible Treat bacteriuria if indicated*	ARV if eligible If breech, ECV or referral for ECV Treat bacteriuria ifindicated*
Preventive measures	Tetanus toxoid Iron and folate+	Tetanus toxoid, Iron and folate IPTp ARV	Iron and folate IPTp ARV	Iron and folate ARV
Health education, advice, and counselling	Self-care, alcohol and tobacco use, nutrition, safe sex, rest, sleepingunder ITN, birth andemergency plan	Birth and emergency plan, reinforcement of previous advice	Birth and emergency plan, infant feeding, postpartum/postnatalcare, pregnancy spacing, reinforcementof previous advice	Birth and emergency plan, infant feeding, postpartum/postnatalcare, pregnancy spacing, reinforcementof previous advice

Record all findings on a home-based record and/or an ANC record and plan for follow-up
Acronyms: (EDD=estimated date of delivery; BP=blood pressure; PIH=pregnancy induced hypertension; ARV=antiretroviral drugs for HIV/AIDS;ECV= external cephalic version; IPTp=intermittent preventive treatment for malaria during pregnancy; ITN=insecticide treated bednet)
*Additional intervention for use in referral centres but not recommended as routine for resource-limited settings
** Should not be given in first trimester, but if first visit occurs after 16 weeks, it can be given at first visit
+Should also be prescribed as treatment if anaemia is diagnose

Antenatal Care - WHO | World Health Organizationhttps://www.who.int › media › aonsectionIII_2PDF

Postnatal vaccination

Vaccine Schedule Simplified

1. **At Birth**
    - **BCG**: Tuberculosis
    - **Hepatitis B**: Prevents Hepatitis B
    - **OPV-0**: Oral Polio
2. **6 Weeks, 10 Weeks, 14 Weeks** (Same vaccines each time)
    - **Pentavalent**: Diphtheria, Pertussis, Tetanus, Hep B, Hib
    - **OPV**: Oral Polio
    - **PCV**: Prevents pneumonia
    - **IPV** (6 and 14 weeks): Polio Injection
3. **9 Months**
    - **Measles-1**

4. **15 Months**
    - **Measles-2**
5. **18 Months**
    - **DPT Booster**
6. **5 Years**
    - **DPT Booster**
7. **10 and 16 Years**
    - **TT (Tetanus)**

National Immunization Schedule 1st January 2023

SN	Age	Vaccine	Dose	Route	Site	Prevent from
1.	At Birth	OPV-0	2 drops	Oral	Mouth	Polio
		BCG	0.05 ml till 1 Mth 0.1 ml after 1 mth	ID	Lt Upper arm	Tuberculosis
		Hep-B	0.5 Ml	IM	Antero-lateral side of mid-thigh	Hepatitis
2.	6 Weeks	OPV-1	2 drops	Oral	Mouth	Polio
		RVV-1	5 drops	Oral	Mouth	Rotavirus Disease
		Pentavalent-1	0.5 Ml	IM	AL side of mid-thigh	Diphtheria, pertussis, Tetanus, Hepatitis, Hemophilus influenza
		FIPV-1	0.1 Ml	ID	Rt. Upper arm	Polio
		PCV-1	0.5 Ml	IM	AL side of mid-thigh	Pneumonia
3.	10 Weeks	OPV-2	2 drops	Oral	Mouth	Polio
		RVV-2	5 drops	Oral	Mouth	Rotavirus Disease
		Pentavalent-2	0.5 Ml	IM	AL side of mid-thigh	Diphtheria, pertussis, Tetanus, Hepatitis, Hemophilus influenza

EXPANDED PROGRAM OF IMMUNIZATION (EPI)

Expanded Program of Immunization					
[illegible]		Dose	Route	Site	Type
At Birth	OPV-0=Polio-0	2 drops	Orally	Orally	Live
	BCG	0.1 ml above 1 month 0.05ml below 1 month	I/D	Rt. Deltoid	Live
	Hep. B (given only in few districts)	0.5ml	I/M		Hep B = Recombinant
At 6 Weeks	OPV-1	2 drops	Orally	Orally	Live
	Pentavalent-1 containing ✓ DPT ✓ Hepatitis B ✓ Haemophilus influenza Type b	0.5 ml	I/M	Antero-lateral aspect of right thigh	D and T=Toxoid P = Killed Hib=Conjugate Hep.B=Recombinant
	Pneumococcal (PCV-10)-1	0.5 ml	I/M	Ant. Lat. Aspect of left thigh	Recombinant
	Rota-1	1.5 ml	Orally	Orally	Live
At 10 Weeks	Polio-2	2 drops	Orally	Orally	Live
	Pentavalent-2 DPT, Hep. B, Hib.	0.5 ml	I/M	Ant. Lat. aspect of right thigh	
	Pneumococcal (PCV-10)-2	0.5 ml	I/M	Ant. Lat. Aspect of left thigh	Recombinant
	Rota-2	1.5 ml	Orally	Orally	Live
At 14 Weeks	Polio-3	2 drops	Orally	Orally	Live
	IPV	0.5 ml	I/M	Ant. Lat. Aspect of left thigh	Inactivated
	Pentavalent-3 DPT, Hep. B, Hib.	0.5 ml	I/M	Ant. Lat. aspect of right thigh	
	Pneumococcal (PCV-10)-3	0.5 ml	I/M	Ant. Lat. Aspect of left thigh	
At 9 Months	Measles-1	0.5 ml	S/C	Lt. Deltoid	Live
At 15 Months	Measles-2	0.5 ml	S/C	Lt. Deltoid	Live
Booster dose 20 to 23 months	DPT Polio		If baby is 24 months old, then only DT is given		

HERD IMMUNITY Level of resistance of a community or group of people to a particular disease is called Herd Immunity. **Example**: If 2/3rd of population in a community becomes immune against polio, the rest 1/3rd will also become immune and will enjoy herd immunity

The immunizing agents include: I. Vaccines II. Immunoglobulins III. Anti-sera I.

Vaccine is an immunobiological substance designed to produce specific protection against a given disease.

Types Vaccines are of following types:

• Live attenuated vaccines (alive organisms have lost their virulence but retained their antigenicity) BCG, OPV

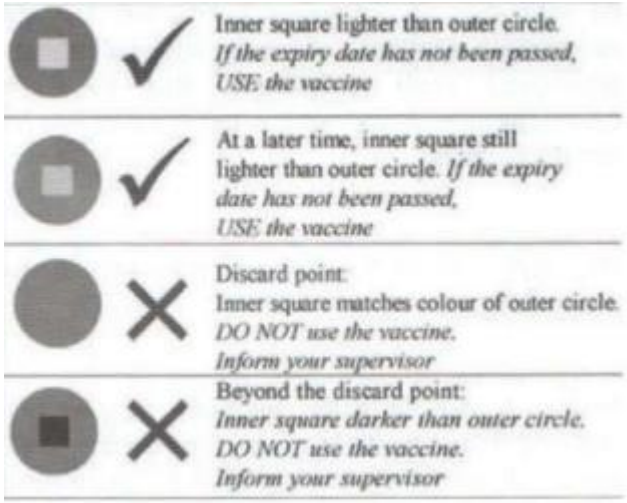
• Inactivated or killed vaccines (organisms are killed by heat, formalized by other chemicals such that their antigenicity is maintained but pathogenicity is lost. They produce **antibodies**)

• Toxoids (Exotoxin produced by certain organisms are defoliated by treating with formalin in such a way that toxicity is destroyed but their antigenicity is retained)

• Combined preparations (• DPT(Diphtheria-Pertussis-Tetanus) • DT (Diphtheria -Tetanus) • DPT and Typhoid vaccine • MMR (Measles - Mumps- Rubella) • DPTP (DPT plus inactivated Polio))

Cold chain is a system of storage and transport of vaccine at low temperature from manufactures to actual vaccine site. Its temperature is -2 to -8

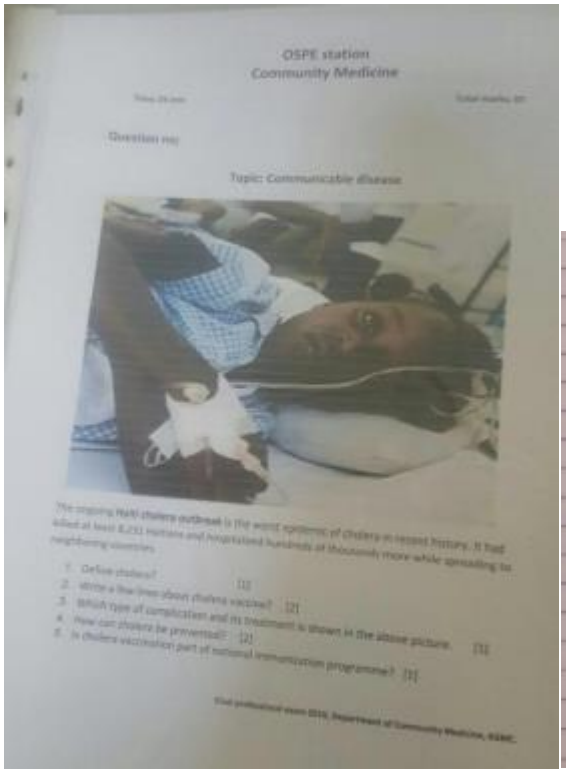
VACCINE VIAL MONITOR A label containing heat sensitive material is placed over the vaccine vial to register cumulative heat exposure over time. Stage 1: Inner-square lighter that outer circle Stage 2: Inner-square still lighter than outer circle If monitor is in stage 1 or 2, vaccine can be used Stage 3: Inner-square matches outer circle Stage 4: Inner-square darker than outer circle If monitor is in stage 3 or 4, discard the vaccine



SHAKE TEST It is recommended by WHO. After removing the vaccine from cold chain, shake it well and if turbidity/ flocculation is formed, vaccine is not able to use. So discard off such vaccine.

Coliform & Fecal Coliform Confirmation Tests (High-Yield)

1. **Coliform Confirmation Test**
    - **Media**: Brilliant Green Bile Broth (BGBB)
    - **Method**: Inoculate sample → Incubate at 35°C for 24-48 hours
    - **Positive Result**: Gas production and turbidity
2. **Fecal Coliform Confirmation Test**
    - **Media**: EC Broth
    - **Method**: Incubate at 44.5°C for 24 hours
    - **Positive Result**: Gas production indicates fecal coliforms



OSPE station
Community Medicine

Topic: Communicable disease

1. Define cholera? [1]
2. Write a few lines about cholera vaccine? [2]
3. Which type of complication and its treatment is shown in the above picture. [3]
4. How can cholera be prevented? [2]
5. Is cholera vaccination part of national immunization programme? [1]

① Cholera Def
Acute diarrheal disease caused by vibrio cholera strains. characterised by profuse onset of watery diarrhea, vomiting & muscle cramps.

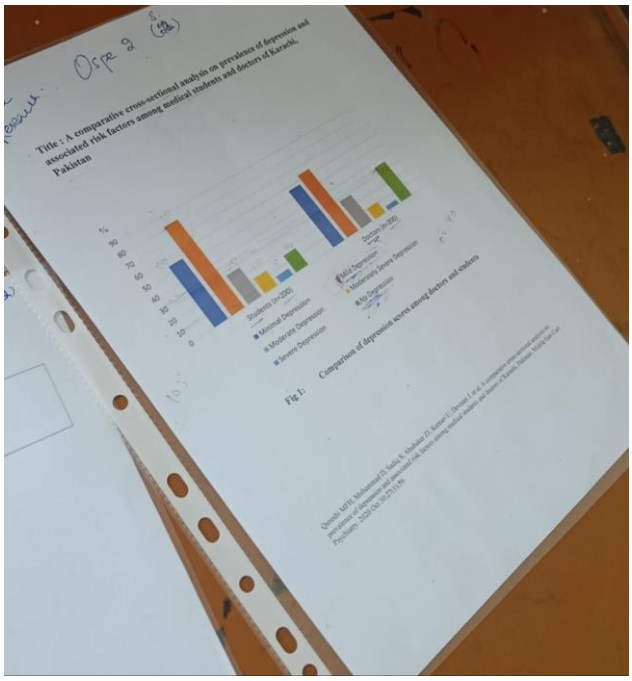
② cholera vaccine is only specific prophylaxis against cholera.
→ 2 equal doses injected subcutaneously at interval of 4-6 weeks.

③ Severe dehydration & electrolyte imbalance

④ Prevention → improved sanitation, clean water, cholera vaccine.

⑤ Not included in EPI.

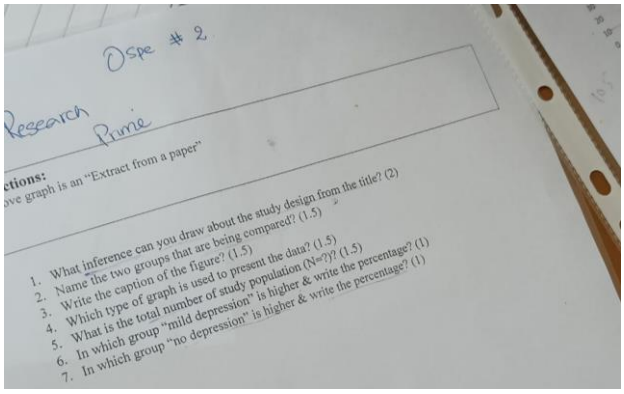
Research viva



Osce 9

Title : A comparative cross-sectional analysis on prevalence of depression and associated risk factors among medical students and doctors of Karachi, Pakistan

Fig 1: Comparison of depression scores among doctors and students



What inference can you draw about the study design from the title?

- It is a **descriptive cross-sectional study**, analyzing the relationship between different groups and levels of depression.

Name the two groups that were compared.

- **Male and female participants** or **two different populations (based on the chart's data).**

Write the percentage of "mild depression" in Group 1.

- (Check the corresponding bar for Group 1 and mild depression on the chart). Example: **20%**.

What is the percentage of "moderate depression" in Group 2?

- (Refer to the bar chart for Group 2 and moderate depression). Example: **15%**.

What is the total number of subjects analyzed in the study?

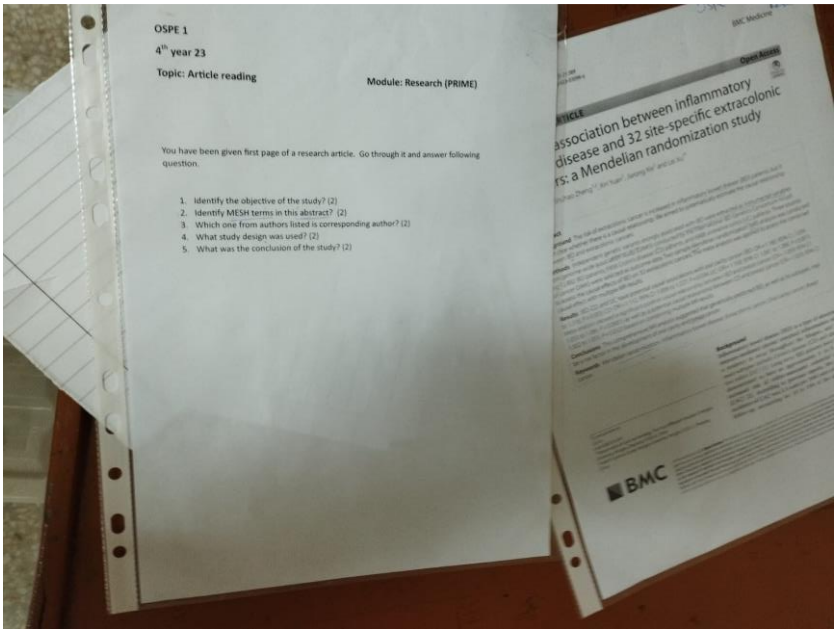
- (Look at the bottom of the bar chart or study description for the total sample size). Example: **100 subjects**.

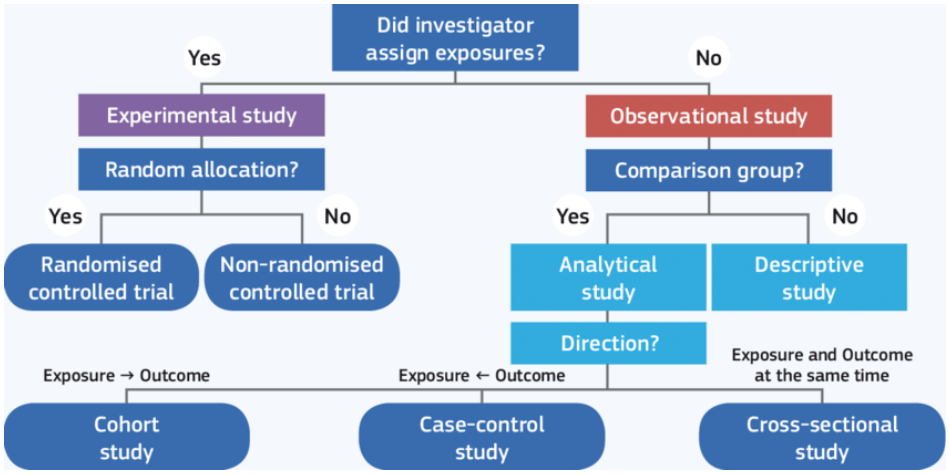
In which group is "no depression" higher, and what is the percentage?

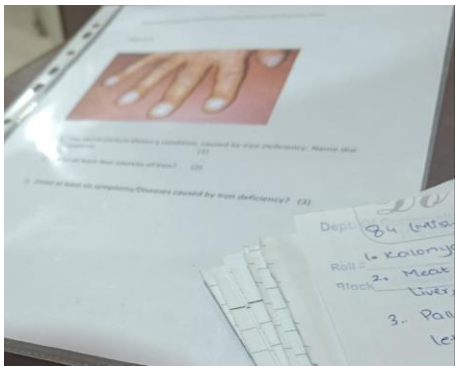
- **Group 1 – 40%** (according to the chart).

In which group "severe depression" is higher, and what is the percentage?

- **Group 2 – 25%** (according to the chart).







What is the condition shown?

- **Koilonychia** (spoon-shaped nails)

⍰ What is the most common cause of this condition?

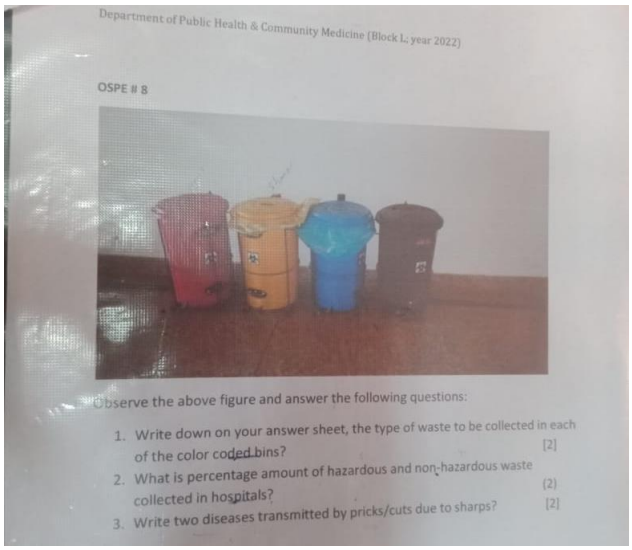
- **Iron deficiency anemia**

Sources of iron

- Red meat (beef, lamb)
- Poultry (chicken, turkey)
- Fish (salmon, tuna, sardines)
- Liver (best source)

Diseases/Conditions Caused by Iron Deficiency Anemia (IDA):

1. **Microcytic Hypochromic Anemia** – Small, pale red blood cells due to reduced hemoglobin.
2. **Pica** – Craving non-food substances like ice, clay, or dirt.
3. **Glossitis and Angular Cheilitis** – Inflammation of the tongue and cracks at the mouth corners.
4. **Restless Leg Syndrome** – Uncomfortable leg sensations, worsened by iron deficiency.
5. **Impaired Cognitive Function** – Poor memory, attention, and developmental delays in children.
6. **Fatigue and Heart Failure (Severe Cases)** – Chronic tiredness; severe anemia can lead to heart complications.


Department of Public Health & Community Medicine (Block L, year 2022)

OSPE # 8

Observe the above figure and answer the following questions:

1. Write down on your answer sheet, the type of waste to be collected in each of the color coded bins? [2]
2. What is percentage amount of hazardous and non-hazardous waste collected in hospitals? (2)
3. Write two diseases transmitted by pricks/cuts due to sharps? [2]

1. **Color-coded bins and their waste types:**
    - **Red:** Infectious waste (e.g., blood-soaked materials, swabs)
    - **Yellow:** Pathological waste (e.g., human tissues, body parts) and sharps waste in puncture-proof containers.
    - **Blue:** Non-infectious waste (e.g., paper, plastic, recyclable waste)
    - **Black:** General waste (e.g., kitchen waste, wrappers)
2. **Percentage of hazardous and non-hazardous waste in hospitals:**
    - Hazardous waste: **15–20%**
    - Non-hazardous waste: **80–85%**
3. **Two diseases transmitted by pricks or cuts due to sharps:**
    - **Hepatitis B**
    - **Hepatitis C**
    - **HIV** (optional as a third example)

MOST COMMON BACTERIA IN UTI:

- Escherichia coli,
- Klebsiella pneumoniae,
- Proteus mirabilis,
- Enterococcus faecalis
- Staphylococcus saprophyticus

PHARMACOLOGY

Drugs used for the treatment of UTI

- PENICILLINS (aminopenicillins and extended spectrum)
- FOSFOMYCIN
- CEPHALOSPORINS (ceftriaxone, cephalexin)
- CARBEPENEMS (imepenem+cilastatin)
- AMINOGLYCOSIDES (gentamycin)
- QUINOLONES (nalidixic acid, ciprofloxacin,levofloxacin)
- SULPHONAMIDES (Trimethoprim and sulfamethoxazole)
- NITROFURANTOIN

Here's the **Mechanism of Action (MOA)** for the drugs used to treat **UTI**:

1. **Penicillins (Aminopenicillins & Extended Spectrum)**:
   - Inhibit bacterial cell wall synthesis by binding to penicillin-binding proteins (PBPs), leading to cell lysis.
2. **Fosfomycin**:
   - Inhibits bacterial cell wall synthesis by blocking **enolpyruvate transferase**, an enzyme involved in peptidoglycan synthesis.
3. **Cephalosporins (Ceftriaxone, Cephalexin)**:
   - Inhibit bacterial cell wall synthesis by binding to PBPs, similar to penicillins, causing cell death.
4. **Carbapenems (Imipenem + Cilastatin)**:
   - Inhibit bacterial cell wall synthesis by binding to PBPs; **cilastatin** prevents the degradation of imipenem by renal dehydropeptidase.
5. **Aminoglycosides (Gentamicin)**:

    - Inhibit bacterial protein synthesis by binding to the 30S ribosomal subunit, causing misreading of mRNA.
6. **Quinolones (Nalidixic Acid, Ciprofloxacin, Levofloxacin)**:
    - Inhibit **DNA gyrase** and **topoisomerase IV**, enzymes required for bacterial DNA replication.
7. **Sulfonamides (Trimethoprim & Sulfamethoxazole)**:
    - **Sulfamethoxazole** inhibits **dihydropteroate synthase**, preventing folic acid synthesis.
    - **Trimethoprim** inhibits **dihydrofolate reductase**, further preventing folic acid synthesis.
8. **Nitrofurantoin**:
    - Inhibits bacterial enzymes involved in **carbohydrate metabolism** and disrupts bacterial DNA.

- Low risk HPV = 6 AND 11
- High risk HPV = 16 AND 18 -→ CERVICAL CA

Anti-Estrogen Drugs:

- **Tamoxifen** – Breast cancer treatment
- **Clomiphene** – Infertility treatment
- **Fulvestrant** – Advanced breast cancer

Anti-Progesterone Drugs:

- **Mifepristone (RU-486)** – Medical abortion
- **Ulipristal** – Emergency contraception
- **Onapristone** – Investigational use for cancer

Mifepristone is a progesterone receptor antagonist that can be used as an **emergency contraceptive**

Raloxifene: This is a selective estrogen receptor modulator (SERM) used primarily for the **prevention and treatment of osteoporosis**, not for emergency contraception.

Ritodrine: A beta-agonist used to **prevent preterm labor** by relaxing the uterus, but not relevant to contraception.

Tamoxifen: Another SERM, primarily used in the **treatment of breast cancer,** not as a contraceptive.

Contraindications of Tamoxifen:

1. **Pregnancy and breastfeeding** – Risk of fetal harm and transfer through breast milk.
2. **History of deep vein thrombosis (DVT) or pulmonary embolism** – Increases clotting risk.
3. **Endometrial cancer or severe uterine abnormalities** – Can worsen these conditions.
4. **Severe liver disease** – Risk of hepatotoxicity.
5. **Hypersensitivity to tamoxifen** – Allergic reactions.

Here's a list of **estrogen/ replacement therapy side effects**:

1. **Common Side Effects**
    - Nausea
    - Breast tenderness
    - Headache
    - Bloating
    - Mood changes
2. **Serious Side Effects**
    - Increased risk of **blood clots** (deep vein thrombosis, pulmonary embolism)
    - **Stroke** and **myocardial infarction** (especially in smokers and older women)
    - **Gallbladder disease**
    - **Liver problems**
    - Increased risk of certain cancers (e.g., **endometrial and breast cancer**)
3. **Reproductive/Endocrine Effects**
    - Irregular vaginal bleeding
    - Reduced libido
    - Weight gain

The **mechanism of action (MOA)** of **Danazol**:

- **Inhibits pituitary gonadotropin secretion**: Danazol suppresses the release of **luteinizing hormone (LH)** and **follicle-stimulating hormone (FSH)** from the anterior pituitary, which **reduces ovarian steroidogenesis**.
- **Androgenic effect**: It has weak androgenic activity, binding to androgen receptors and partially suppressing estrogen production.
- **Reduces estrogen receptors**: Decreases the levels of sex hormone-binding globulin (SHBG), leading to reduced free estrogen and progesterone in the body.

Clinical Effects:

- Inhibits ovulation and menstrual cycles.
- Reduces endometrial growth, used in the treatment of **endometriosis**.
- Suppresses autoimmune inflammation, used in conditions like **fibrocystic breast disease** and **hereditary angioedema**.

Estrogen plays a significant role in **fertility regulation** in both males and females. Here's how it affects infertility in each:

In Females:

Estrogen is essential for reproductive health, but **imbalances** can lead to infertility.

1. **Normal Role:**
    - Promotes **endometrial growth** for embryo implantation.
    - Regulates the menstrual cycle by coordinating with progesterone.
    - Maintains the health of the **fallopian tubes** for egg transport.
2. **Excess Estrogen (Hyperestrogenism):**
    - **Anovulation** (no ovulation).

- **Polycystic Ovary Syndrome (PCOS)** – common cause of infertility.
- **Endometrial hyperplasia** – thickening of the uterine lining, affecting implantation.
- **Fibroids and endometriosis** – estrogen-dependent conditions that impair fertility.

3. **Low Estrogen:**
   - **Irregular cycles or amenorrhea** (absence of periods).
   - Poor **endometrial development**, preventing implantation.
   - Increased risk of **miscarriage** due to insufficient luteal phase support.

In Males:

Estrogen is present in smaller amounts but plays a crucial role in maintaining fertility.

1. **Normal Role:**
   - Regulates **spermatogenesis** (sperm production).
   - Maintains **fluid reabsorption in the epididymis**, ensuring normal sperm concentration.
2. **Excess Estrogen:**
   - **Decreased testosterone production**, leading to reduced libido and erectile dysfunction.
   - **Impaired spermatogenesis** – lower sperm count and motility.
   - **Gynecomastia** (breast development) and fat redistribution, reducing overall reproductive health.
3. **Low Estrogen:**
   - Can impair **sperm maturation**.
   - Leads to abnormal fluid accumulation in the reproductive tract, affecting sperm quality.

1. **Tamsulosin MOA**:
   - **Selective α1A-adrenergic antagonist** → relaxes smooth muscle in the bladder neck, prostate, and urethra → improves urine flow in **BPH** (benign prostatic hyperplasia).
2. **Why Tamsulosin is preferred over Prazosin**:
   - **Selective for α1A receptors** → fewer cardiovascular side effects (less hypotension).
   - Longer duration of action.
   - Better tolerated in elderly patients with BPH.
3. **Steroid to Reduce ICP**:
   - **Dexamethasone** is commonly used to reduce intracranial pressure (in conditions like brain tumors).
   - It stabilizes the blood-brain barrier and reduces vasogenic edema.
4. **Dexamethasone to Prednisone Conversion**:
   - **Dexamethasone is ~6-7 times more potent** than prednisone.
   - **1 mg of dexamethasone ≈ 6-7 mg of prednisone**.

Ocps side effects

OCPS

- **Definition**: Medications used to prevent pregnancy.

- Types:

1. Combined Oral Contraceptives (COCs)
2. Progestin-Only Pills (POPs)

Mechanism of Action (COCs)

- Estrogen Component:
  - Inhibits FSH → Prevents follicle maturation.
- Progestin Component:
  - Inhibits LH → Prevents ovulation.
  - Thickens cervical mucus → Impedes sperm penetration.
  - Alters endometrium → Reduces implantation likelihood.

Mechanism of Action (Progestin-Only Pills)

- Primary Action: Thicker cervical mucus.
- Secondary Actions:
  - Alters endometrial lining.
  - Inhibits ovulation (less consistent than COCs).

Types of Combined Oral Contraceptives

- **Monophasic Pills**: Fixed estrogen and progestin dose.
- **Biphasic and Triphasic Pills**: Varying hormone doses to mimic the menstrual cycle.

Benefits of Oral Contraceptives

- Contraceptive Effectiveness: ~99% with correct use.
- Non-Contraceptive Benefits:
- Regulates menstrual cycles.
- Reduces risk of ovarian and endometrial cancers.
- Decreases acne and hirsutism.

Adverse Effects

- Common: Nausea, breast tenderness, headache, mood changes.
- Serious:
- Venous thromboembolism (VTE).
- Hypertension.
- Stroke (rare).

Contraindications

- Absolute:

- History of thromboembolic disorders.
- Breast cancer.
- Uncontrolled hypertension.

- Relative:

- Migraines with aura.
- Smoking (age >35).

Drug Interactions

- CYP450 Inducers: Rifampin, anticonvulsants, decrease effectiveness.
- Antibiotics: Controversial; potential reduction in efficacy.
- Other Medications: St. John's Wort.

Management of Missed Pills

- **COCs**:

- 1 Missed Pill: Take ASAP and continue.
- 2 or More Missed Pills: Use backup contraception for 7 days.

- **POPs**:

- If >3 hours late: Backup contraception needed for 48 hours.

Long-Term Effects and Considerations

- Fertility: No long-term impact; fertility typically returns soon after discontinuation.
- Bone Health: COCs may impact bone mineral density in young women.
- Breast Cancer Risk: Slight increased risk, but reduced risk for other cancers.

OCPs adverse effects

Adverse Effects of OCPs

1. **Common**: Nausea, headache, weight gain, mood changes, breakthrough bleeding
2. Serious:
    - **Cardiovascular**: Thromboembolism, stroke, hypertension
    - **Hepatic**: Liver adenoma, cholestatic jaundice
    - **Cancer**: ↑ Cervical cancer risk, ↓ Ovarian and endometrial cancer risk
    - **Metabolic**: Glucose intolerance, hyperlipidemia

Contraindications of OCPs

1. **Absolute**: Thromboembolism, stroke, breast cancer, pregnancy, liver disease, migraine with aura
2. **Relative**: Smoking >35 years, hypertension, diabetes with complications, gallbladder disease

Injectable Progestins

1. **Depot Medroxyprogesterone Acetate (DMPA)**
    - **Dose:** 150 mg IM every 3 months
    - **Mechanism:** Inhibits ovulation, thickens cervical mucus, and alters the endometrium.
    - **Indications:** Contraception, endometriosis, heavy menstrual bleeding
2. **Subcutaneous DMPA (104 mg)**
    - Self-administrable every 3 months

Adverse Effects:

- Irregular bleeding
- Weight gain
- Delayed return to fertility
- Bone mineral density loss with long-term use

OCPs vs Injectable Progestins

Category	OCPs	Injectable Progestins
Indications	- Contraception	- Long-term contraception
	- PCOS	- Endometriosis
	- Acne, Dysmenorrhea	- Menorrhagia
Contraindications	- Pregnancy	- Pregnancy
	- History of thromboembolism	- Active thromboembolic disorders
	- **Migraine** with aura	- Breast cancer
	- Breast cancer	- Liver disease
	- Smokers >35 years	- Osteoporosis (long-term use)

Clomiphene Citrate

Mechanism of Action (MOA):

- **Selective Estrogen Receptor Modulator (SERM)**
- Blocks estrogen receptors in the hypothalamus → inhibits negative feedback → increases GnRH secretion → stimulates FSH and LH release → promotes follicular development and ovulation.

Indications:

1. **Ovulation induction** in infertility (e.g., PCOS)
2. **Unexplained infertility**
3. **Male infertility** (to increase spermatogenesis in some cases)

Short OSPE version:
"Clomiphene blocks estrogen receptors, boosting FSH and LH, inducing ovulation in infertility." ☺

Adrenocortical Antagonists

1. **Steroidogenesis Inhibitors** (block cortisol synthesis)
    - **Ketoconazole**: Inhibits 17α-hydroxylase
    - **Metyrapone**: Inhibits 11β-hydroxylase
    - **Etomidate**: Inhibits 11β-hydroxylase (IV use for severe Cushing's)
2. **Glucocorticoid Receptor Antagonist**
    - **Mifepristone (RU-486)**: Blocks glucocorticoid and progesterone receptors
3. **Adrenolytic Agents**
    - **Mitotane**: Destroys adrenal cortex cells (used for adrenal carcinoma)

Adrenocortical Hormones (Agonists)

Category	Example	Uses
Glucocorticoids	Prednisone, Dexamethasone	Asthma, autoimmune diseases, inflammation

Mineralocorticoids	Fludrocortisone	Addison’s disease, orthostatic hypotension
Androgens	Testosterone	Hypogonadism, delayed puberty

What is pituatry apoplexy?

Pituitary Apoplexy

It is a **medical emergency** caused by **sudden hemorrhage or infarction of the pituitary gland**, usually in a pre-existing pituitary adenoma.

Key Features:

- **Severe headache** (sudden onset)
- **Visual disturbances** (e.g., bitemporal hemianopia, diplopia due to cranial nerve compression)
- **Altered mental status**
- **Hypopituitarism** (adrenal insufficiency, hypotension, nausea, vomiting)

Contraindications of radioactive iodine therapy---USED FOR THE TREATMENT OF THROTOXICOSIS, BETA RAYS DESTROY THE THYROID PARENCHMA (**Crosses placenta or breast milk and destroy fetal thyroid gland)**

1. Pregnancy
2. Breastfeeding
3. Severe Thyroid Eye Disease (Graves' Ophthalmopathy)
4. Planned or Recent Conception
5. Children and Adolescents
6. Uncontrolled Thyrotoxicosis
7. Hypersensitivity to Iodine
8. Concurrent Use of Antithyroid Drugs

ANTITHYROID DRUGS

Class	Representative
Thioamides	Propylthiouracil
	Methylthiouracil
	Methimazole
	Carbimazole
Anion inhibitors	Perchlorate, Pertechnitate & Thiocyanate
Iodides	KI, NaI
Radioactive iodine	^{131}I
β-adrenoceptor blockers	Propranolol

Anti-thyroid Drugs:

1. **Thionamides** (Methimazole, Propylthiouracil - PTU):
   - **MOA**: Inhibit thyroid peroxidase, blocking the oxidation of iodide to iodine and the incorporation of iodine into thyroglobulin, thus inhibiting thyroid hormone synthesis.
2. **Radioactive Iodine (I-131)**:
   - **MOA**: Selectively destroys hyperactive thyroid tissue by emitting beta radiation, leading to reduced thyroid hormone production.
3. **Potassium Iodide (Lugol's Solution)**:
   - **MOA**: Inhibit thyroid hormone release and decrease the size and vascularity of the thyroid gland by reducing the iodide trapping.
4. **Beta-Blockers (Propranolol)**:
   - **MOA**: Symptomatically control hyperthyroid symptoms (e.g., tachycardia, tremors) by blocking the effects of thyroid hormones on the heart and circulation.
5. **Lithium**:
   - **MOA**: Inhibits the release of thyroid hormones, used for certain types of hyperthyroidism (e.g., in the treatment of thyrotoxicosis).
6. **Glucocorticoids (Dexamethasone)**:
   - **MOA**: Reduce peripheral conversion of T4 to T3, used in severe cases or thyroid storm.

B blockers role in tx of hyperthyroidism:--WITHOUT INTRINSIC SYMPATHOMIMETIC ACTVITIY (Propanolol, Metoprolol, Atenolol)

Beta-Blockers (e.g., **Propranolol**) are used in hyperthyroidism to:

- **Control symptoms** like tachycardia, tremors, and anxiety.
- **Block thyroid hormone effects** on the heart, reducing heart rate and palpitations.
- Provide **symptomatic relief** while other treatments take effect.

Moa of methamazole--- thioamide--- All thioamides inhibit **peroxidase-catalyzing reactions**

- Iodine organification
- Iodotyrosines condensation
- inhibits coupling of iodotyrosines (MIT & DIT)

Thyroid storm management

- Vigorous management mandatory
- Propranolo **1-2mg IV** slowely or **40-80mg po 6hourly**
- If propranolol contraindicated use diltiazem for hypertention and tachycardia
- KI solution 10drops po daily
- Propylthiouracil 250mg po QID / methemazole
- If cant take po then give per **rectally** retention enema form
- IV hydrocrtisone 50mg QID
- Supportive therapy fever heart failure etc
- Rarely **plasma pharesis** peritoneal dialysis may be used **to bring down throxine level**

Amiodarone-Induced Thyroid Dysfunction: (Amiodarone: An iodine-containing antiarrhythmic drug that blocks peripheral conversion of T4 to T3, affecting thyroid function.)

1. **Hypothyroidism**:
    - **Mechanism**: Due to the high iodine content in amiodarone, leading to the **Wolff-Chaikoff effect** (inhibition of thyroid hormone synthesis in response to iodine overload).
    - Occurs in patients with underlying thyroid disease (e.g., multinodular goiter).
2. **Hyperthyroidism**:
    - **Mechanism 1**: Iodine-induced hyperthyroidism (type I), due to increased synthesis of thyroid hormone, typically in patients with pre-existing thyroid conditions (e.g., multinodular goiter).
    - **Mechanism 2**: Inflammatory thyroiditis (type II), leading to leakage of thyroid hormones into circulation.
    - **Treatment**:
        1. **Thioamides** (e.g., methimazole or propylthiouracil) to inhibit thyroid hormone synthesis.
        2. **Steroids** to reduce inflammation in type II amiodarone-induced thyrotoxicosis.

Methimazole and Propylthiouracil (PTU) Mechanism of Action

- **Inhibit thyroid hormone synthesis** by blocking **thyroid peroxidase enzyme**. This prevents:
    - **Oxidation of iodide**
    - **Iodination of tyrosine residues** on thyroglobulin

    - **Coupling of iodotyrosines (MIT + DIT)** to form **T3 and T4**
- **Propylthiouracil (PTU)** has an **additional action**:
    - Inhibits **peripheral conversion of T4 to T3**.

Difference

- **Methimazole** is the preferred drug (more potent, longer half-life).
- **PTU** is used in **thyroid storm** and **1st trimester of pregnancy** due to lower teratogenic risk.

BISOHOSPHONATES: **Bisphosphonates**

Examples: Etidronate, pamidronate (only parentral), alendronate, ibandronate, zolendronate

MoA (*inhibition of osteoclast activity*)

- Decrease activity of the osteoclast proton pump (needed to dissolve hydroxyapatite) and increases osteoclast apoptosis ("programmed cell death").
- BPs also reduces transformation of osteoclast precursor cells to mature osteoclasts.
- Bind to bone, inhibit calcium resorption

They also interfere with mevalonate pathway of cholesterol synthesis which is required for normal function of osteoclasts.

Antidiabetic drugs classification

Two Main Classes

1. **Insulin and Insulin Analogues**
2. **Oral Anti-diabetic Drugs**

I. Insulin and Insulin Analogues

- Rapid-acting (e.g., Lispro)
- Short-acting (e.g., Regular insulin)
- Intermediate-acting (e.g., NPH)
- Long-acting (e.g., Glargine, Detemir)

II. Oral Anti-diabetic Drugs

1. **Insulin Secretagogues**
    - **Sulfonylureas** (e.g., Glimepiride)
    - **Meglitinides** (e.g., Repaglinide)
2. **Biguanides** (e.g., Metformin)
3. **Thiazolidinediones (TZDs)** (e.g., Pioglitazone)
4. **α-Glucosidase Inhibitors** (e.g., Acarbose)
5. **Incretin-Based Therapy**
    - GLP-1 Agonists (e.g., Exenatide)
    - DPP-4 Inhibitors (e.g., Sitagliptin)
6. **SGLT2 Inhibitors** (e.g., Canagliflozin)
7. **Amylin Analogues** (e.g., Pramlintide)
8. **Bile Acid Sequestrants** (e.g., Colesevelam)
9. **Dopamine Agonists** (e.g., Bromocriptine)

Mechanism of Action (MOA) of Metformin

- **Primary action**: Decreases hepatic glucose production (gluconeogenesis).
- **Increases insulin sensitivity** in peripheral tissues (muscle and fat).
- **Enhances glucose uptake** and utilization by muscles.
- **Reduces intestinal glucose absorption**

Key Points: Metformin does **NOT** stimulate insulin secretion, so it **doesn't cause hypoglycemia**.

Mechanism of Action of Sulfonylureas

- **Stimulate insulin secretion** by binding to **sulfonylurea receptors (SUR1)** on pancreatic **β-cells**.
- This **closes ATP-sensitive K+ channels**, causing membrane **depolarization**.
- **Calcium channels open**, increasing **Ca2+ influx**, which triggers **insulin release**.

Examples:

- 1st generation: Tolbutamide, Chlorpropamide
- 2nd generation (more potent): Glibenclamide, Glipizide, Glimepiride

What hx to ask from rape victim. If married and unmarried

The two key defects in **NIDDM (Type 2 Diabetes)** are:

1. **Insulin Resistance** – Decreased response of peripheral tissues (muscle, liver, adipose) to insulin.
2. **β-cell Dysfunction** – Impaired insulin secretion by pancreatic β-cells.

These defects lead to **hyperglycemia** and **progressive glucose intolerance**.

Parameters of growth

Disaster wala agha 4 components agha respone,recovery ,prevevtion waghira

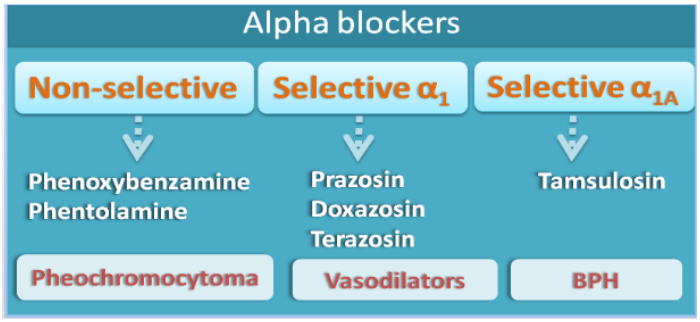
What is gonorrheoa??

BPH

- Benign prostatic hyperplasia (BPH), also known as prostate enlargement, is a noncancerous enlargement of the prostate gland that affects almost all men as they age. Symptoms include:
- Difficulty starting to urinate / Weak urine stream
- Dribbling at the end of urination
- Frequent urination (Urgency)
- Sensation of incomplete bladder emptying (hesitancy)
- Frequent awakening at night to urinate/ Incontinence

Pharmacotherapy of BPH

- α1 Blockers:
- 5-α- Reductase Inhibitors



Mechanism of Action of Tamsulosin

Tamsulosin

Blockade of the α1a receptors **decreases tone** in the smooth muscle of the **bladder neck and prostate** and improves urine flow. It has the **least effect on blood pressure** because it is less selective for α1B receptors found in the blood vessels and more selective for α1A receptors in the prostate and bladder.

Side Effects of α1 Blockers

α1-Blockers may cause **dizziness**, a **lack of energy**, **nasal congestion**, **headache**, **drowsiness**, and **orthostatic hypotension**

FIRST DOSE PHENOMENON:

First dose of these drugs may produce an **exaggerated orthostatic hypotensive response**, **may lead to syncope**. This action, termed a "first-dose" effect, may be minimized by **adjusting the first dose to one-third or one-fourth of the normal dose** and **by giving the drug at bedtime**.

By blocking α receptors in the ejaculatory ducts and impairing smooth muscle contraction, α1 antagonists may cause *inhibition of ejaculation and retrograde ejaculation.*

5 α-reductase inhibitor

Finasteride -------- 5 α-reductase inhibitor

It inhibits the conversion of testosterone to dihydrotestosterone (DHT).

DHT causes the prostate to grow and enlarge. Inhibition of this conversion decreases the size of prostate and improves urinary outflow.

5 -α– REDUCTASE INHIBITORS **(5-ARIs)** FINASTERIDE AND DUTASTERIDE

For symptom improvement, 5-ARI monotherapy should be used as a treatment option in patients with LUTS (lower urinary tract smptoms)/BPH (benign prostatic hyperplasia) with prostatic **enlargement** as judged by a **prostate volume of > 30g** on imaging, a **prostate specific antigen (PSA) > 1.5ng/mL**, or **palpable prostate** enlargement on digital rectal exam (DRE).

SIDE EFFECTS OF 5-ALPHA REDUCTASE IHIBITORS

- Sexual dysfunction, including erectile & Ejaculatory dysfunction, decreased libido.
- Gynecomastia, or enlargement of breast tissue in men
- Depression, Anxiety
- Infertility
- High-grade prostate cancer
- Cardiovascular morbidity/risk factors

COMBINATION THERAPY

5-alpha receptor inhibitors, alone or in combination with alpha blockers are recommended as a treatment option to prevent progression of LUTS/BPH and/or reduce the risks of urinary retention and need for future prostate-related surgery.

PROSTATE CANCER

MAJOR GROUPS OF ANTI-CANCER DRUGS

5. Alkylating agents
6. Antimetabolites
7. Natural products
   - Vinca alkaloids
   - Epipodophyllotoxins
   - Taxanes
   - Antibiotics
   - Camptothecines
   - Enzymes
8. Miscellaneous Agents
   - Hydroxyurea
   - Imatinib
9. Hormones and antagonists

Treatment of prostate cancer

Prostate cancer is **responsive to hormonal manipulation** leading to **elimination of testosterone production**

- chemical castration/ medical castration--- (a procedure that uses drugs to reduce testosterone levels in me)
- Bilateral orchiectomy (surgical castration) ---(a surgical procedure to remove both testicles, making the patient infertile)

- or estrogen therapy in the form of **diethylstilbestrol**

was **previously used as first-line therapy**.

Hormones (first line)

ESTROGEN are

- *Physiological antagonists of androgens*
- They antagonize the effect of androgens in androgen dependent prostatic carcinoma also impact the epigenetics and genetics androgen production.

FOSFESTROL (prodrug) is activated to **stilbesterol** in the prostatic tissue.

- It **achieves high concertation in the prostate** therefore preferred in prostatic carcinoma.

hormonal replacement with diethylstilbesterol is effective in **symptoms control for 2 years**.

Hormones (second line)

- Second-line hormonal therapies include **aminoglutethimide** (Acromatose inhibitor) plus **hydrocortisone**,
- antifungal agent **ketoconazole plus hydrocortisone**,
- or **hydrocortisone** alone.

COMPARISON OF FIRST - AND SECOND-LINE HORMONAL THERAPY

Aspect	Aromatase Inhibitors	Diethylstilbestrol (DES)
Mechanism	Inhibit enzymes in androgen biosynthesis	Synthetic estrogen with estrogenic effects
Target	Androgen biosynthetic pathway	Androgen production and signaling, impact on epigenetics and genetics
Action	Reduces androgen levels	Suppresses androgen production
Effect on Prostate Cancer	Inhibits prostate tissue growth	Impacts cancer growth
Pathway	Androgen synthesis inhibition	Estrogenic pathways
Strategy	Hormone level alteration	Hormone level alteration
Outcome	Affects cancer cell behavior	Affects cancer cell behavior

Treatment of prostate cancer (Hormone /anti-androgens)

Presently, the use of

- **luteinizing hormone-releasing hormone (LHRH) agonists**— including
- **leuprolide** and **goserelin agonists** (alone or in combination with)
- an **antiandrogen** (e.g, **flutamide, bicalutamide, or nilutamide**)—
  is the preferred approach.

Finasteride -------- 5 α-reductase inhibitor.

(LHRH) agonists

- Leuprolide and Goserelin
- Administration of these agents **increase FSH and LH**.

- Continuous administration causes **down regulation of receptors of LHRH in the pituitary**. This leads to medical/chemical **castration**, making it a well-established therapy for advanced prostatic carcinoma.
- Hormonal therapy **relieves bone pain in 70-80% of patients**.
- Goserelin is associated with the **reduction in PSA levels.**

Anti-Androgen

Flutamide:

- it is an **NSAID**
- Blocks the androgen at receptor level.

Finasteride

Finasteride -------- 5 α-reductase inhibitor

- It inhibits the conversion of testosterone to dihydrotestosterone (DHT).
- DHT causes the prostate to grow and enlarge. Inhibition of this conversion decreases the size of prostate and improves urinary outflow.
- It is usually used along with Flutamide (anti-androgen) for palliative treatment of advanced prostatic cancer.

Glucocorticoids

are used as **adjuvant therapy** because they have

- **Anti-inflammatory effect** and **decrease edema** associated with tumors
- Foster a feeling of **well being**
- **Suppress Hypersensitivity** reaction associated with anti-cancer drugs
- **Control hypercalcemia** (caused by secretion of PTHr peptide, accounting for hypercalcemia in prostate cancer)
- **Potentiate the antiemetic effect** of Ondansetron/Granisetron/Metachlopromide

*hypercalcemia of malignancy involves three main mechanisms: excessive secretion of parathyroid hormone-related protein **(PTHrP)**, bony metastases releasing osteoclast activating factors, and the production of 1,25-dihydroxy vitamin D (calcitriol)*

Treatment Of Advanced Prostate Cancer Refractory To Hormonal Therapy

Mitoxantrone (antibiotic)+ **Prednisone**(glucocorticoid)

Effective as **palliative treatment** in those experiencing severe bone pain.

Adverse effects:

- Acute and chronic cardiotoxicity
- Dark blue discoloration of fingernails/urine and sclera.
- Myelosuppression/neutropenia/mucositis.

- ECG abnormalities /pericarditis/myocarditis.

Estramustine + Taxanes (Docetaxel/Paclitaxel).

Response rate is > doubled to 40-50%

MOA of **Estramustine**.

Estramustine is a **conjugate of estradiol and alkylating agent**, which binds to microtubule-associated proteins and tubulin of cells, thereby **inhibiting activity of microtubules** and leading to **anaphase arrest** (Anaphase is the stage of mitosis after the process of metaphase, when replicated chromosomes are split and the newly-copied chromosomes are moved to opposite poles of the cell). It also has additional anticancer benefit given **antiandrogen effects** due to the **estradiol component.**

MOA of **Taxanes**:

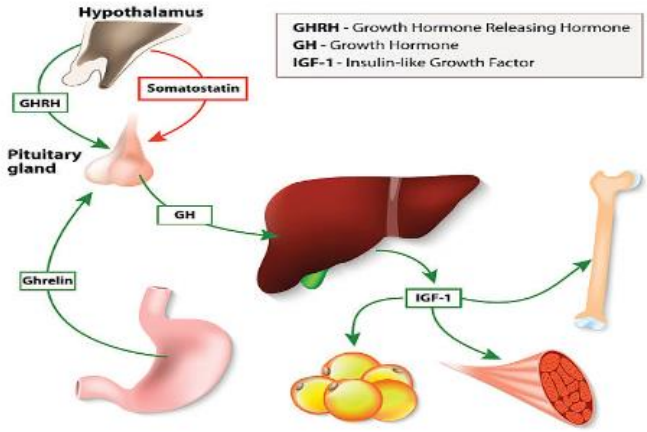
They bind to **β –tubulin**, stabilizing the microtubules in abnormal form and **inhibits further mitosis**.

Docetaxel (Taxanes)+ Prednisone(glucocorticoid)

- This is combination has more **increased the survival rate** as compared to that achieved with Mitoxantrone Prednisone.
- **It is currently considered to be standard care for hormone refractory – prostate cancers**.

Growth hormone:

- Also called somatotrophin
- Produced by **ANTERIOR pituatry**
- Required during childhood and adulthood
- Effects are mediated via
  - IGF-1 (insulin like growth factor 1)
  - IGF-2
  - Directly



Pharmacokinetics:

- Endogenous GH half life 20-25min

- Cleared by liver
- Recombinant human GH (rhGH) given subcutaneously 3-7times per week
- Peak level in 2-4hr
- Active blood level up to 36hrs

Pharmacodynamics: Mediate its effects via cell surface Receptors **JAK/STAT cytokines receptor family**

Insulin like growth factor= SOMATOMEDIN

IGF-1= skeletal and cartilage growth

IGF-2= fetal growth

GH (increase insulin resistance ---mild hyperglycemia) and IGF-1(lowers glucose) have opposite effect on glucose metabolism

GH produces Prolactin like effects

Clinical uses of rGH

Primary Therapeutic Objective	Clinical Condition
GROWTH	Growth failure in pediatric patients with;
	GH deficiency
	Prader-willi syndrome
	Short stature home box-containing gene deficiency
	Turner syndrome
	Small for gestational age with failure to catch up by age 2
	Idiopathic short stature in pediatrics
Improved metabolic state, Increase lean body mass, Sense of well being	GH deficiency in adults
Increased lean body mass, weight, physical endurance	Wasting in patients with HIV infection
Improved GI function	Short bowel syndrome TPN dependent patients

SE OF GH:

- Generally well tolerated in children.
- Rarely reported
    - intra-cranial hypertension
    - Scoliosis during rapid growth
    - Otitis media in turner syndromes
    - Hypothyroidism so periodic TFTs are done on rGH treatment
    - Pancreatitis
    - Gynecomastia
    - Nevus growth
- IN ADULTS tend to have more adverse effects
    - Peripheral edema
    - Myalgia's
    - Arthralgia's especially hand and wrist
    - Carpel tunnel syndrome
    - Induces cytochrome p450 so decreases drug level of other medicine

- Proliferative retinopathy

CI

- In patients with known malignancy
- Critically ill patient increase mortality

MECASERMIN for **severe IGF-1 deficiency** (**nonresponsive to GH)**

Mecasermin recombinant human IGF-1 & rh IGF binding protein 3

- Administered subcutaneously
- Twice daily
- Starting dose 0.04- 0.08mg/kg
- Increased weekly upto max bd dose of 0.12mg/kg
- Adverse effects
  - Hypoglycemia
  - To avoid hypoglycemia meal intake or snack 20min before or after mecasermin administration
  - Intracranial hypertention
  - Asymptomatic elevation of liver enzymes

GH ANTAGONISTS

Somatostatin analogs

- **Octreotide** (45times more potent than somatostatin for inhibiting GH. Only 2times potent than somatostatin in inhibiting insulin release so reduced chances of hyperglycemia during Octreotide treatment. **Other indications of Octreotide are 1.** Hormone secreting tumors carcinoid ,glucaganoma, gastrinoma etc. 2. Diabetic diarrhea, 3. Variceal bleed)
- **Lanreotide**

Dopamine receptor agonists

- **Bromocriptine** (Ergot derivatives. High affinity for D2 receptor. Suppress prolactin release very effectively)

Clinical uses:

- Prolactinoma
- Parkinson's disease
- To suppress lactation (now discouraged)
- Acromegaly
  - 20-30mg per day
  - Seldom response adequately
  - Used alone or in combination with other modality of treatment
    - Pituitary surgery
    - Radiation therapy
    - Octreotide

Toxic adverse effects:

- Nausea, headache, lightheadedness
- Orthostatic hypotension, fatigue
- Psychiatric manifestation even with small doses takes longer to resolve
- Ergot derivative at high dose may cause cold induced peripheral vasospasm

- Vaginal prep causes local irritation
- Postpartum ladies may cause stroke or coronary thrombosis for suppressing lactation
- **Cabergoline**

GH receptor antagonist

- **Pegvisomant** (Used to **treat acromegaly**. It is polyethylene glycol (PEG) derivative of a mutant GH, B2036)It works by blocking the effects of growth hormone in the body, specifically by binding to growth hormone receptors and preventing their activation.
- **Somavert**: This medication also acts as a growth hormone receptor antagonist, inhibiting the actions of growth hormone in the body.

Growth Hormone Agonists

1. Somatropin (Recombinant GH)

- **Mechanism of Action**: Mimics natural growth hormone by stimulating growth in bones, muscles, and tissues via IGF-1 (Insulin-like Growth Factor-1) production.

Prescriptions for acute and chronic UTI

Prescriptions for graves disease

Prescriptions for DM1, DM2