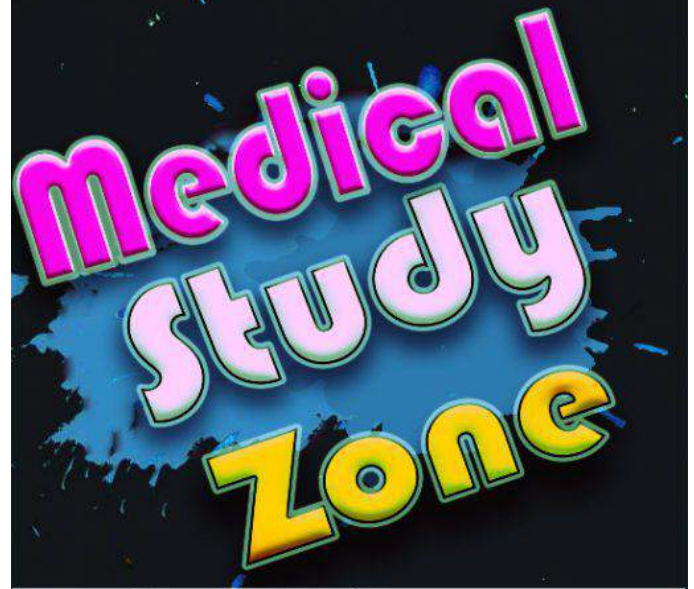


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POSTPARTUM HAEMORRHAGE

- MMR → around 130/100,000 Women
 → MCC - OBSTETRIC HAEMORRHAGE

OBSTETRIC HAEMORRHAGE - TYPES

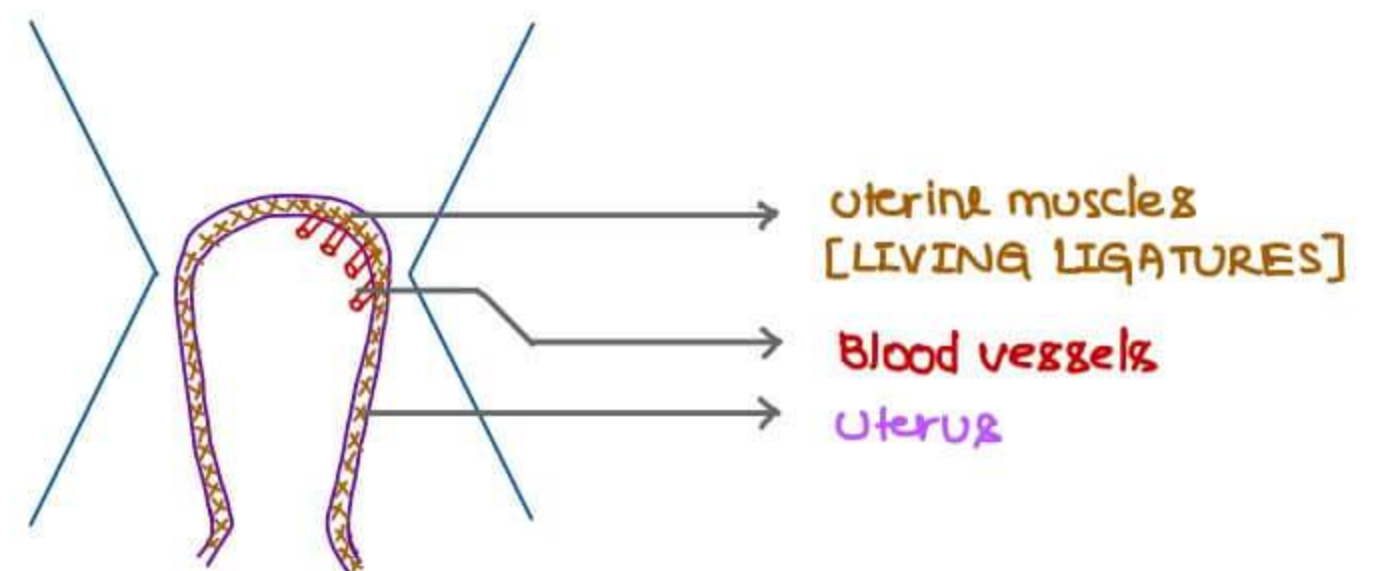
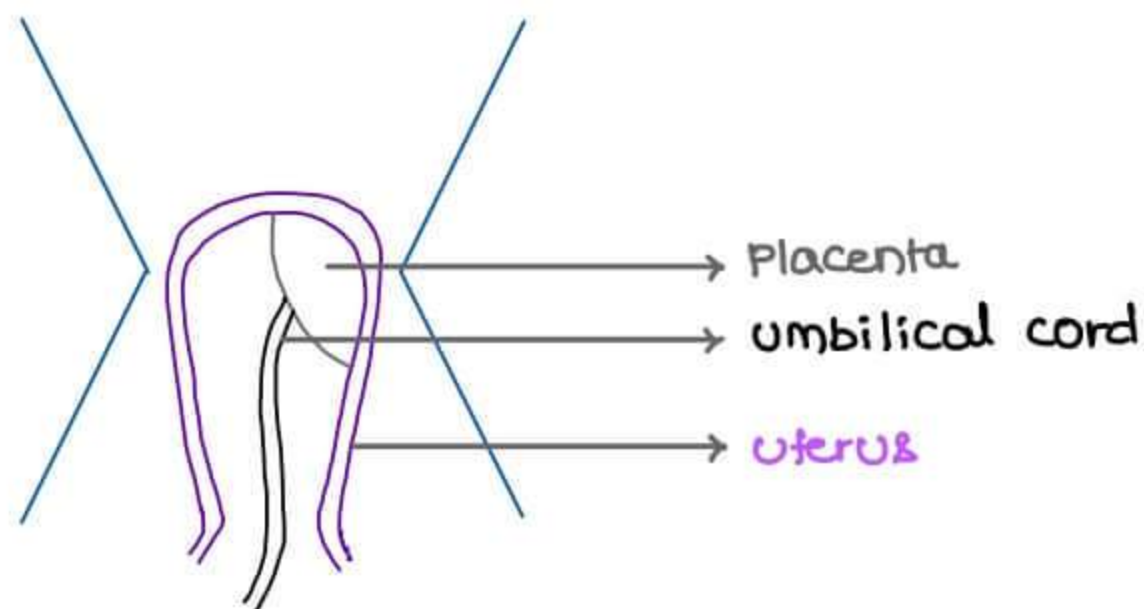
- ① Antepartum Haemorrhage → Any bleed in genital tract after 28 WK
 ② Postpartum Haemorrhage → Any bleed in genital tract after delivery
 → MCC OF MMR in India

POST PARTUM HAEMORRHAGE [PPH]

DEFINITIONS

- > 500 ml in normal Delivery
 → > 1000 ml in a cesarean section
 → Mild PPH → 500 ml to 1000 ml
 Moderate PPH → 1000 ml to 2000 ml
 Severe PPH → > 2000 ml
 Massive Obstetric Haemorrhage → > 1500 ml
 → Any Haemorrhage which can reduce Hb by 1 gm% → PPH
 → If Hb drops by > 4 gm% → massive Obstetric Haemorrhage

ACTIVE MANAGEMENT OF 3rd STAGE OF LABOUR

AFTER Removing Placenta [CONTROLLED CORD TRACTⁿ]

- controlled cord traction
 → Uterine massage
 → Oxytocin

→ Incidence of PPH → 5%

CAUSES

1. ATONIC UTERUS [80%]
 - Large uterus → Big baby / Twins / ↑ liquor
 - Infections → PROM / Chorioamnionitis
 - Prolonged labour
2. INJURIES [TRAUMA] → uterus, cervical, vaginal

→ Rate of Rise \bar{c} oral & \bar{c} injectable preparatⁿ is same [1gm% over 2 1/2-3wks]

REQUIREMENT	→	$2.21 \times wt \text{ in kg} \times (\text{Targeted Hb} - \text{Pt Hb}) + 1000 \text{ mg (stores)}$
	→	$\cong 200 \text{ mg / Hb deficiency}$

→ Requirement of Blood for Rx of Anemia

- Hb → < 7gm% or severely anemic in Late in pregnancy
- whole blood ↑ Hb by 0.8 - 0.9 gm%
- Packed cells ↑ Hb by 0.8 - 0.9 gm% [lesser volume load] [so Better]

→ IDA INDICES

① SERUM FERRETIN

- 1st parameter to change
- (N) - 40 - 160 ng/ml
- IDA - < 20 ng/ml

- ② Hb → ↓
- ③ MCV → ↓
- ④ MCH → ↓
- ⑤ Serum Iron → < 50 µg/dl
- ⑥ Total Iron Binding capacity → > 400 ng/dl
- ⑦ Red cell Distributⁿ width [RDW] → ↑

→ THALASSEMIA INDICES

- ① RDW → Normal
- ② MCH → < 27 Pg [(N) - 29 ng]
- ③ Hb → Normal
- ④ MCV / RBC → < 13 [MENTZER INDEX]

MEGALOBLASTIC ANEMIA

CAUSES

1 FA Deficiency

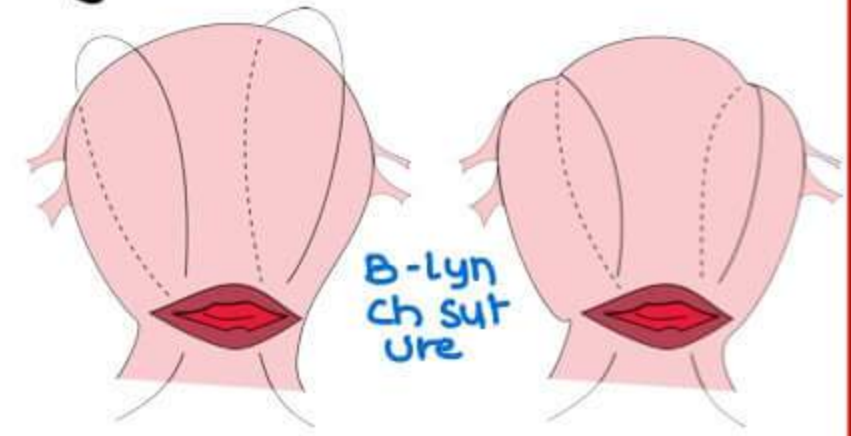
- ↑ Demand
- ↓ Supply
- Malabsorptⁿ
- Intestinal Sx or resectⁿ

2 Vit B₁₂ Deficiency

- ↓ Absorptⁿ
- ↓ Intrinsic factor
- Achlorhydria

⑩ SURGICAL METHODS :

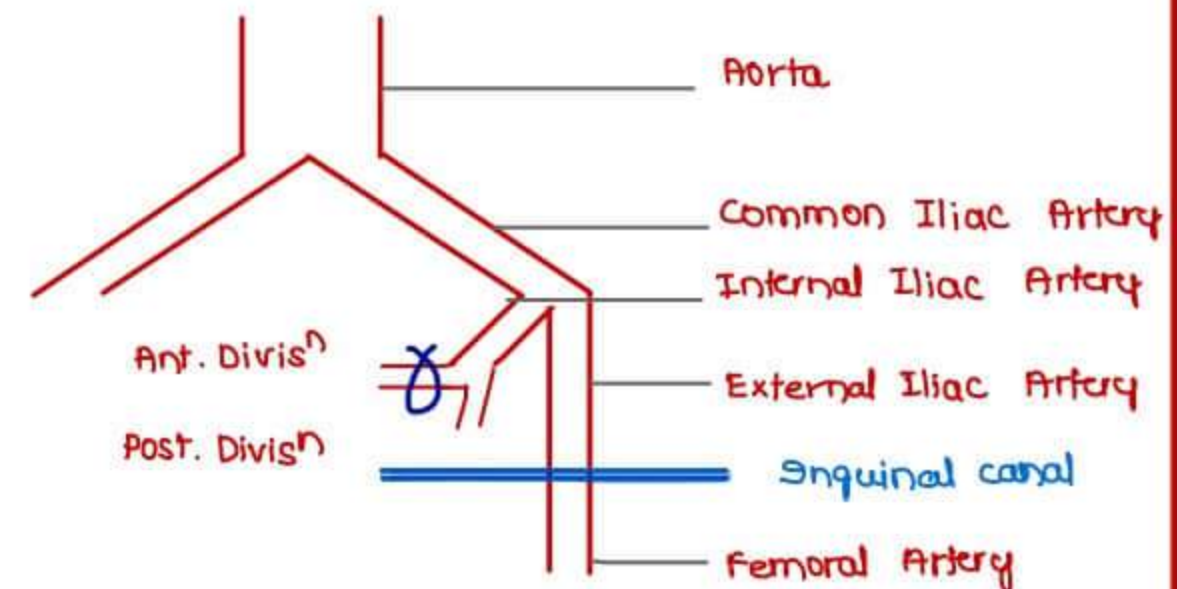
- compression / Brace Sutures → Christopher B Lynch in 1997
- Heyman's Sutures
- uterine artery ligatⁿ
- Ovarian artery ligatⁿ
- Internal Iliac artery ligatⁿ
- Hysterectomy



→ INTERNAL ILIAC ARTERY LIGATION

Ant. Divisⁿ of Internal Iliac Branches :

- Uterine
- Obturator
- Superior vesical
- Inferior vesical
- Internal pudendal
- Middle rectal
- Inferior gluteal
- vulval
- clitoral



Posterior Division Internal Iliac Artery Branches

- Superior Gluteal Short G
- Iliolumbar IL
- Lateral sacral LS

PRINCIPLE

- Using a snug ligature we reduce the pulse pressure [from an Artery to vein] → sluggish flow → Induces Thrombosis

THERAPEUTICAL GOALS

- | | |
|---------------------------------------|----------------------|
| → Hb | → > 8 gm/dl |
| Fibrinogen | → > 100 mg/dl |
| Prothrombin Time | → < 1.5 times of (N) |
| Activated Partial Thromboplastin time | → < 1.5 times of (N) |
| Platelet count | → > 75000 |

- Immediate O^{-ve} Blood Transfusion can be given
- 4 units of Group matched blood through @ 14 gauge IV cannulas

UTERINE INVERSION

- Inversion causes
- Neurogenic shock
- Haemorrhagic shock
- Mcc of death dlt inversⁿ
- Haemorrhagic shock

CAUSES

- Fundal Implantatⁿ of Placenta
- Uterine atony
- Badly adhered placenta
- Sudden cord tractⁿ

MANAGEMENT

- IV Access
- Fluids, Blood
- Try & Reposit ASAP
 - ① Manual Reposition
 - ② Hydrostatic Reposition → O' SULLIVAN'S
 - Give Inj Terbutaline → Relaxer Uterus
- ↓
- Reposit
- ↓
- Give Inj. Oxytocin
- Inj. Methylergometrine
- Surgical Methods
 - HUNTINGTON'S METHOD → Atraumatic clamp
 - HAULTIAN METHOD → Resectⁿ of The constricting Bands

SEPARATION OF PLACENTA**METHODS**

- Controlled cord Traction [BRANDT & ANDREW'S]
- CREDES METHOD [Obsolete Now] → causes RETAINED PLACENTAL BIT

SIGNS

- Lengthening of cord
- Fresh bleeding
- Suprapubic bulge [Most specific sign]

RETAINED PLACENTA

- Separatⁿ of Placenta → > 30 min
- Management
 - Manual Removal of placenta UNDER GENERAL ANESTHESIA
 - FOR RETAINED PLACENTAL BIT → 2^o PPH
 - Mx by curettage → complicatⁿ → Ashermann syndrome

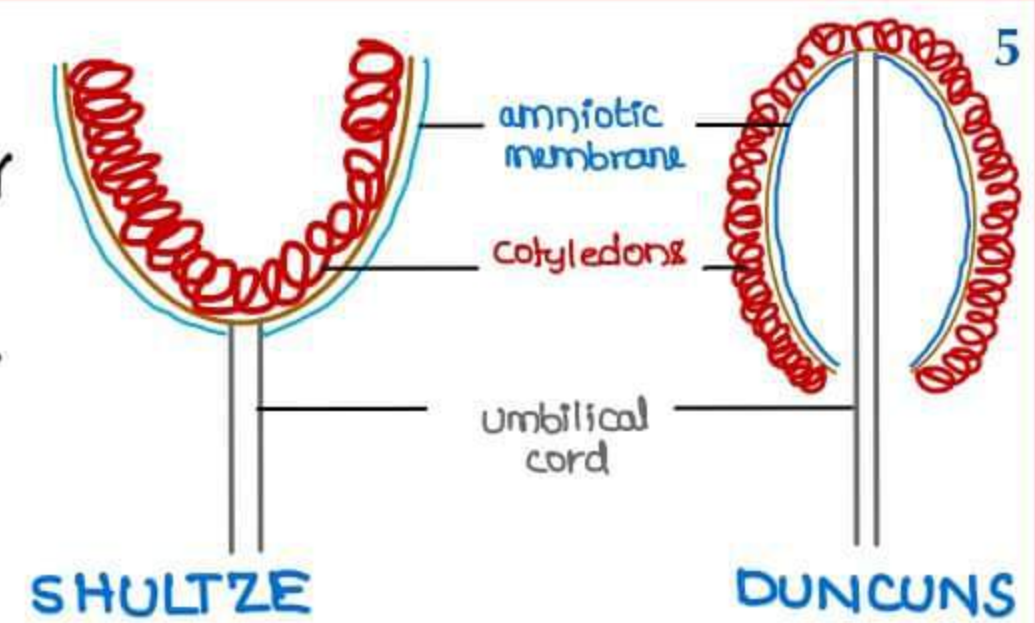
MODES OF SEPERATION

CENTRAL SEPARATION / SHULTZE SEPARATION → SHINY

- membranes comes first ; More common

MARGINAL SEPARATION / DUNCUNS SEPARATION → DIRTY

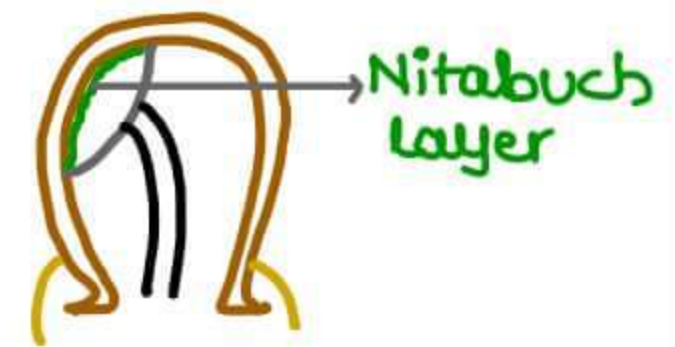
- cotyledons comes first



NITABUCH LAYER

- Fibrinoid layer at which placental separatiⁿ happens
- Absence of layer → Morbidly adherent Placenta

- Ⓐ PLACENTA ACCRETA
 - Ⓑ PLACENTA INCRETA
 - Ⓒ PLACENTA PERCRETA
- } can cause severe PPH

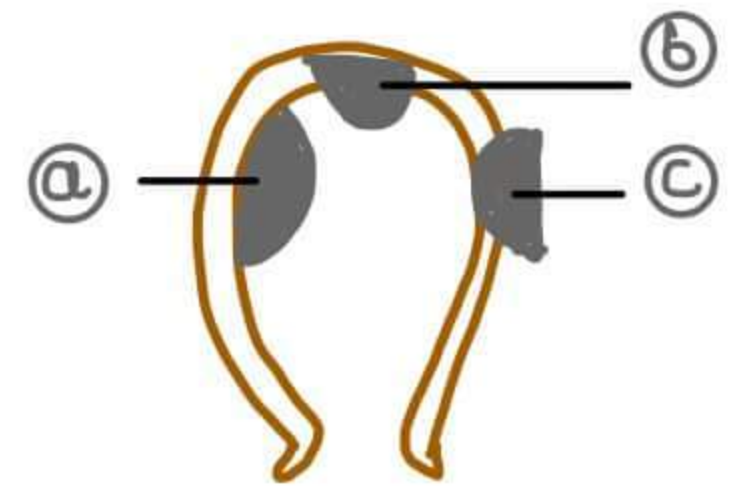


Management

- Laparotomy + Obstetric Hysterectomy
- IF able to save the uterus

↓

- Post Op → Methotrexate
Actinomycin
- } to prevent the persistence of trophoblastic tissues.



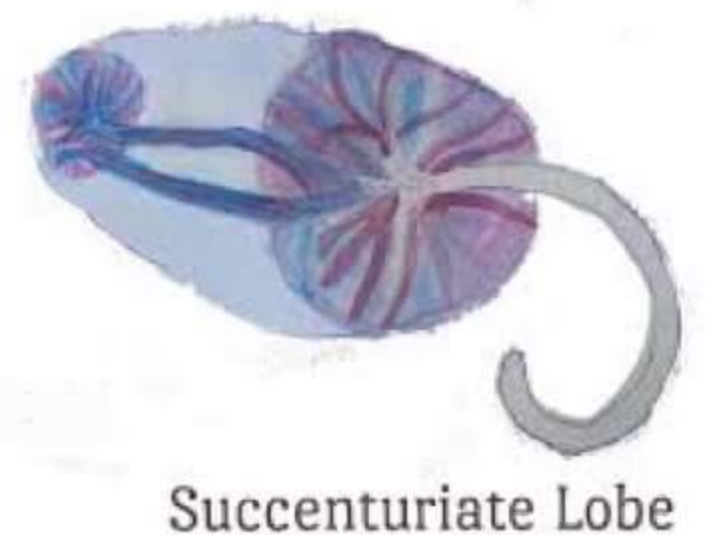
Predisposing conditions

- Previous cesarean sectⁿ
- Previous curettage
- Placenta Previa [Low lying placenta] - mc
- chronic infections



BATTLEDORE PLACENTA

- Marginal Insertion
- detached in delivery



ACCESSORY / SUCCENTURIATE LOBE

- form placental Retained Bit

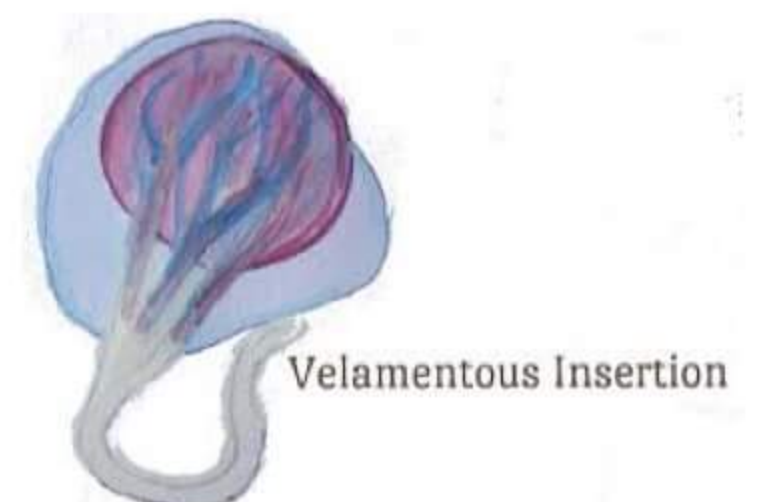
CIRCUMVALLETE PLACENTA

- central clearing
- doubled up membranes on the periphery
- may be associated w IUGR & APH



VELLAMENTOUS CORD

- Splitting of cord present
- VASA PREVIA → vellamentous cord at os
 - can have fetal bleeding [50% fatal]
 - Painless bleeding



- Diagnosis

- Doppler [Best]
- **APT TEST** [Alkaline denaturatⁿ test]
 - Additⁿ of NaOH to vaginal blood in a test tube
 - colourless → Maternal blood [Alkaline denaturatⁿ]
 - stays red → Fetal RBC
 - Helps to distinguish between maternal & fetal RBC's
 - Qualitative test
 - [**KLIEHAUER BETKE TEST** - Quantitative test]
- **SINGER'S TEST**
 - Qualitative test
 - Alkaline denaturatⁿ test

RH ISOIMMUNIZATION

→ ≅ Rh Alloimmunization → Antibodies made in one human body acts against Red cells of another human body

RH FACTOR

→ Present on chromosome 1

→ Antigens in Rh factor

- RHD / RHCE

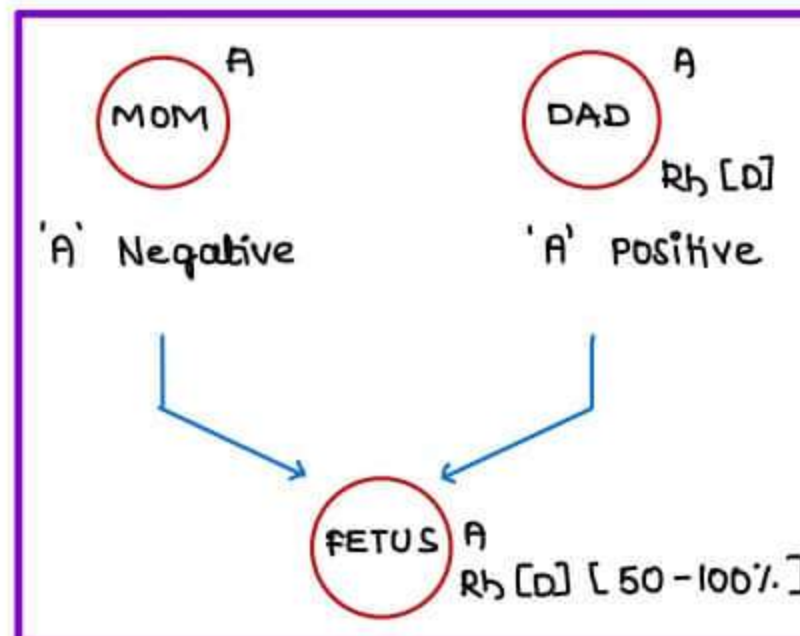


- main antigen → D

→ **DAD** **MOM**
ⓀⓀ ⓀⓀ



ⓀⓀ ⓀⓀ



→ **DAD** **MOM**
ⓀⓀ ⓀⓀ



Ⓚ Ⓚ

→ **DAD** **MOM**
ⓀⓀ ⓀⓀ



Ⓚ 25%

→ **DAD** **MOM**
ⓀⓀ ⓀⓀ



ⓀⓀ ⓀⓀ

mother blood gets **MIXED** fetal blood at the time of →

- Delivery [5-30 ml] [mc]
- Abortion
- molar pregnancy
- Ectopic pregnancy
- Abruptio
- Injury of abdomen
- Amniocentesis
- chorionic villi sampling

- ① Rh Negative mother + Rh Positive Baby
 - Sensitization of mother
 - 1st Baby will be safe
- ② Rh sensitized mother + Rh positive Baby
 - Rh Incompatibility occurs
 - Baby is not safe

Antigen/Antibody Reaction on fetal RBCs →

- Hemolysis
- Anemia
- ↑ Bilirubin → Jaundice, kernicterus [$> 20 \text{ mg/dl}$]
- ↑ 3rd space collections → Ascites, Pleural effusion
Pericardial effusion, Edema } **HYDROPS FETALIS**
- **ERYTHROBLASTOSIS FETALIS**

PREVENTION

- Mortality → 20-30%
- ANTI-D, 300 μg within 72 hrs
 - will neutralize 30 ml blood [15 ml RBCs]
 - can be given upto 4 wks

ANOTHER SITUATION

- 1st PREGNANCY → Rh Negative Mother & Rh Positive Baby
 - ↓
 - ANTI-D GIVEN in 72 Hrs
 - ↓
- 2nd PREGNANCY → Baby dies d/t Hydrops Fetalis

→ PROBABLE CAUSES

① NON IMMUNE HYDROPS FETALIS

- m.c.c. of Hydrops Fetalis

CAUSES

- cardiac [m.c.] → congenital Heart Block
- infectious → Parvo Virus B-19
- GI causes
- Haematological → α Thalassemia
- Renal → Polycystic kidney disease
- Genito urinary → Posterior urethral valve
- cystic hygroma

② ABORTION

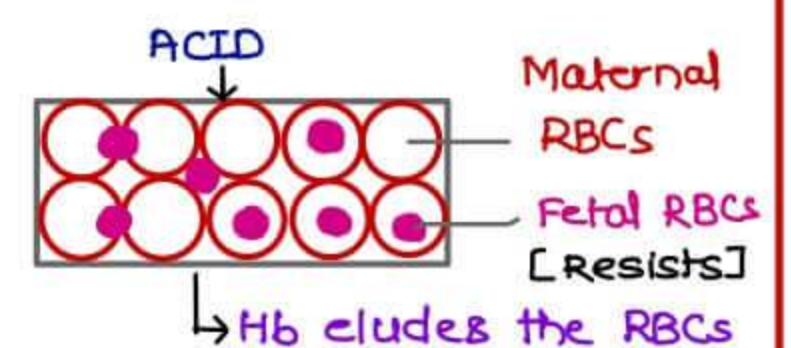
③ MIXED - MATCHED BLOOD TRANSFUSION

④ INADEQUATE ANTI-D

KLIEHAUER BETKE TEST [Acid Elution Technique]

- measures fetomaternal Haemorrhage
- Quantitative test

$$\text{FMH} = \% \text{ contamination} \times \text{Maternal Blood Volume} \times \frac{\text{Maternal Haematocrit}}{\text{Fetal Haematocrit}}$$



CASE 1

→ Rh Negative & 1st visit

INDIRECT COOMB TEST

- 1st visit → Negative
- 20 weeks → Negative
- 24 weeks → Negative
- 28 weeks → Negative
- 32 weeks → Negative
- 36 weeks → Negative
- 40 weeks → Delivered

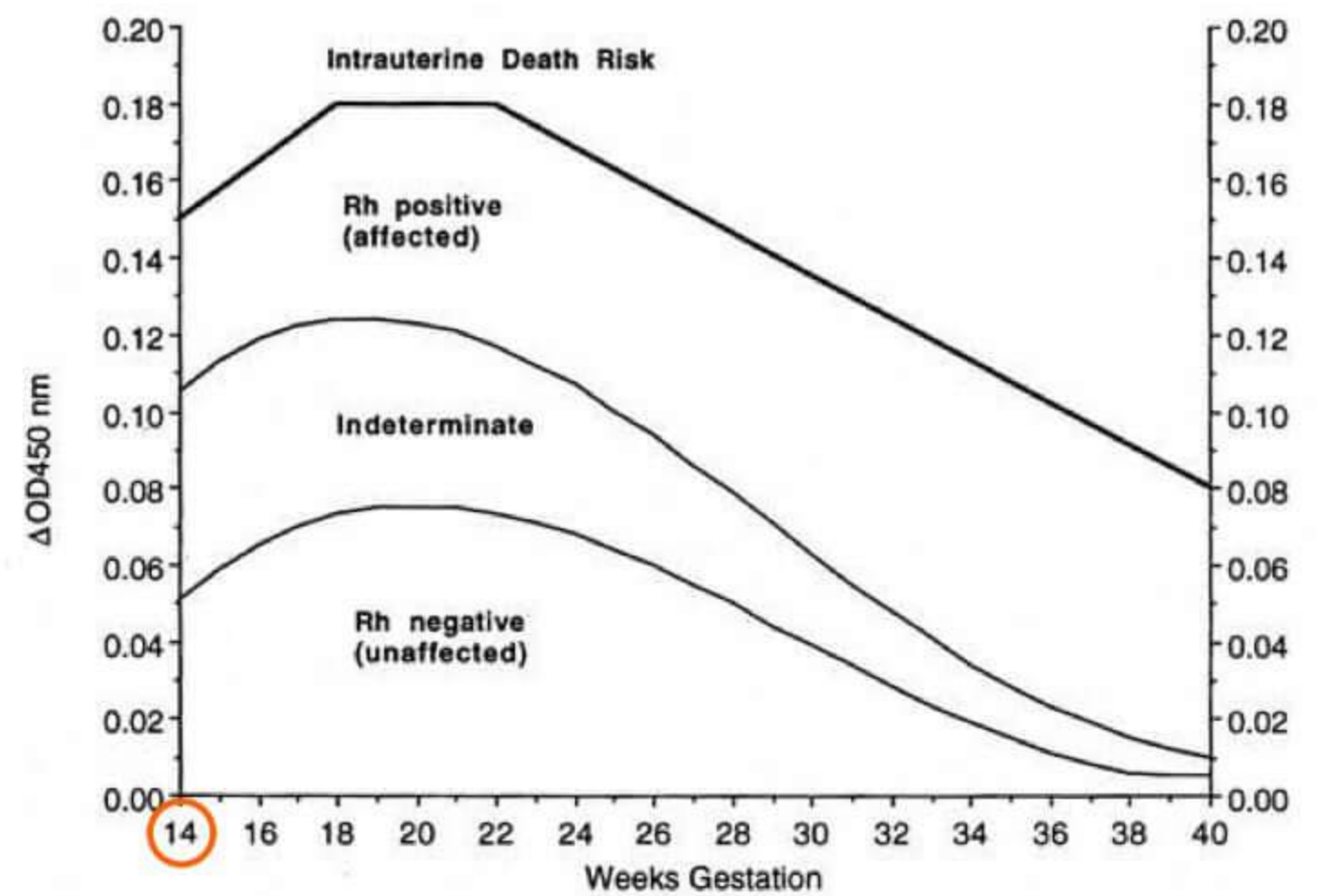
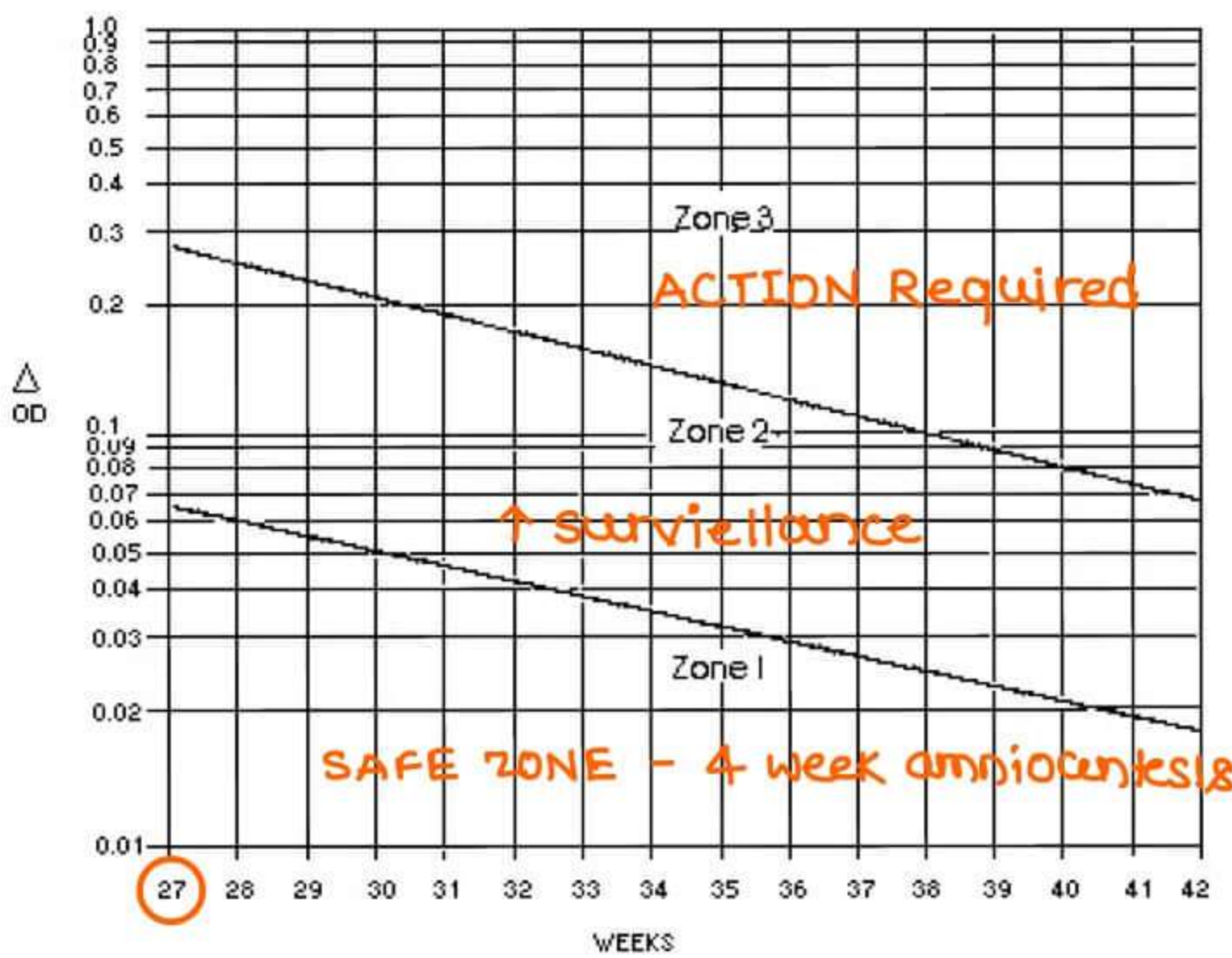
CASE 2

→ Rh Negative & 1st visit

INDIRECT COOMB TEST

- 1st visit → Negative
- 20 weeks → Negative [1:16 +ve]
- 24 weeks → Positive [is safe]
- 25 weeks → 1:16 Positive
- 26 weeks → 1:16 Positive
- 27 weeks → 1:16 Positive
- 28 weeks → 1:1024 Positive

- DO Amniocentesis & DO Spectrometry in the Amniotic fluid [Bilirubin] & Plot **LILLEY'S GRAPH** - Plot **QUEENAN'S CHART** [more sensitivity]



- Q Optical Density at 28 weeks increased from 0.5 to 0.8 [upper 3rd zone]. MANAGEMENT should be ?
- A Intra Uterine Blood Transfusion into the cord or intra peritoneal transfusⁿ

→ Rh Negative & 1st visit

INDIRECT COOMB TEST

- | | | |
|-------------|---|--|
| 1st visit | → Negative | |
| 20 weeks | → Negative | |
| 24 weeks | → Negative | |
| 28 weeks | → Negative | → Inj ANTI - D 300 µg [work for 6 wks] |
| 34 weeks | → Negative | → Inj ANTI - D 300 µg |
| At Delivery | → Positive | → Inj ANTI - D 300 µg |
| | → Negative | → Nothing to be done |
| | → Prophylactic Anti - D now is given at 28 wks & then at delivery if Baby is Rh +ve | |

TWIN PREGNANCY, MOLAR PREGNANCY, GTD, CONTRACEPTION [SPL CASES]

TWIN PREGNANCY

HELLIN'S LAW

- Incidence
 - Twins → 1 in 80 Pregnancies
 - Triplets → 1 in $(80)^2$ Pregnancies
 - Quadruples → 1 in $(80)^3$ Pregnancies

↑ CHANCE

- ↑ Age
- ↑ Parity
- ↑ Weight
- Blacks > caucasians
- Infertility Rx → CLOMIPHENE CITRATE, IVF

MATERNAL COMPLICATIONS

- ↑ Abortions
- ↑ Hyperemesis
- ↑ Preterm labour
- HTN / PET
- DM
- PPH

FETAL COMPLICATIONS

- IUGR
- Growth Discordancy
- Single fetal Demise
- congenital abnormalities
- malpresentatⁿ
- Twin to twin transfusⁿ syndrome

PLACENTAL COMPLICATIONS

- ↑ Placenta Previa
- ↑ Abruptions
- cord entanglement
- PROM

FORMATION OF TWINS

MONOZYGOTIC / IDENTICAL TWINS

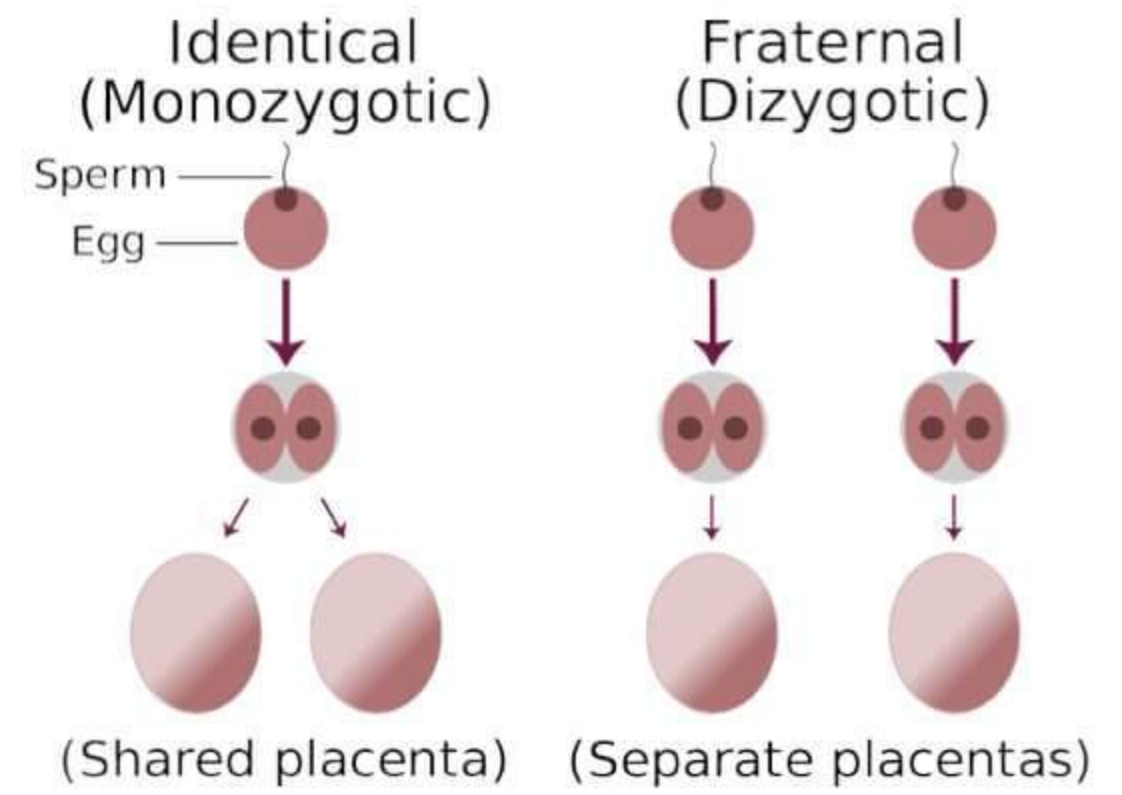
→ incidence → 1/250 pregnancies

DIZYGOTIC / NON IDENTICAL / FRATERNAL TWINS

→ incidence → 1/60 - 1/80 Pregnancies

SUPERFECUNDITY

- 2 oocytes in 1 cycle
- more common type of Dizygotic twins

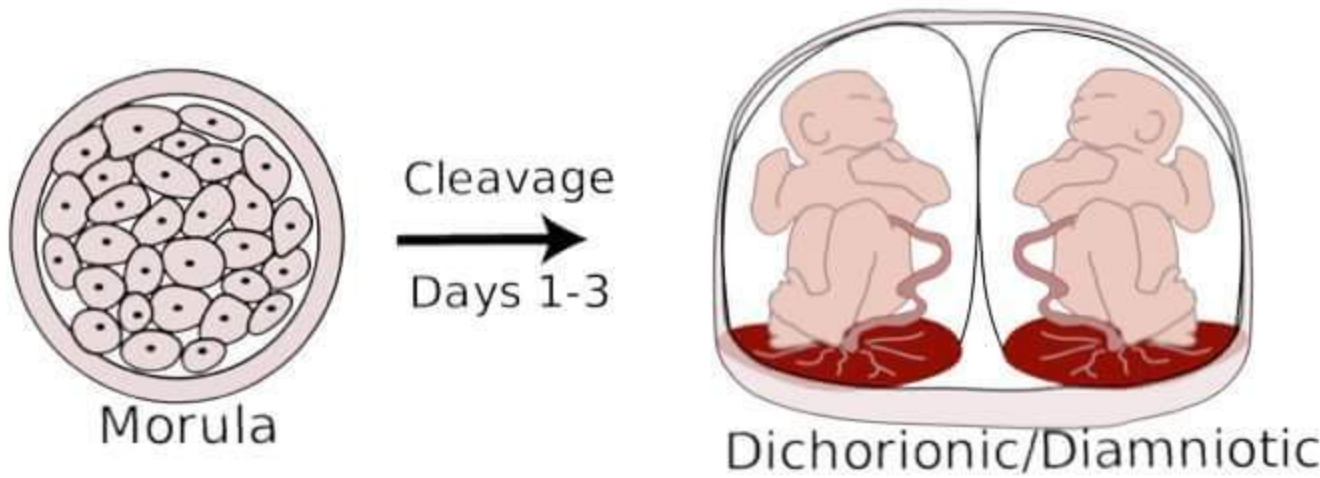


SUPER FETATION

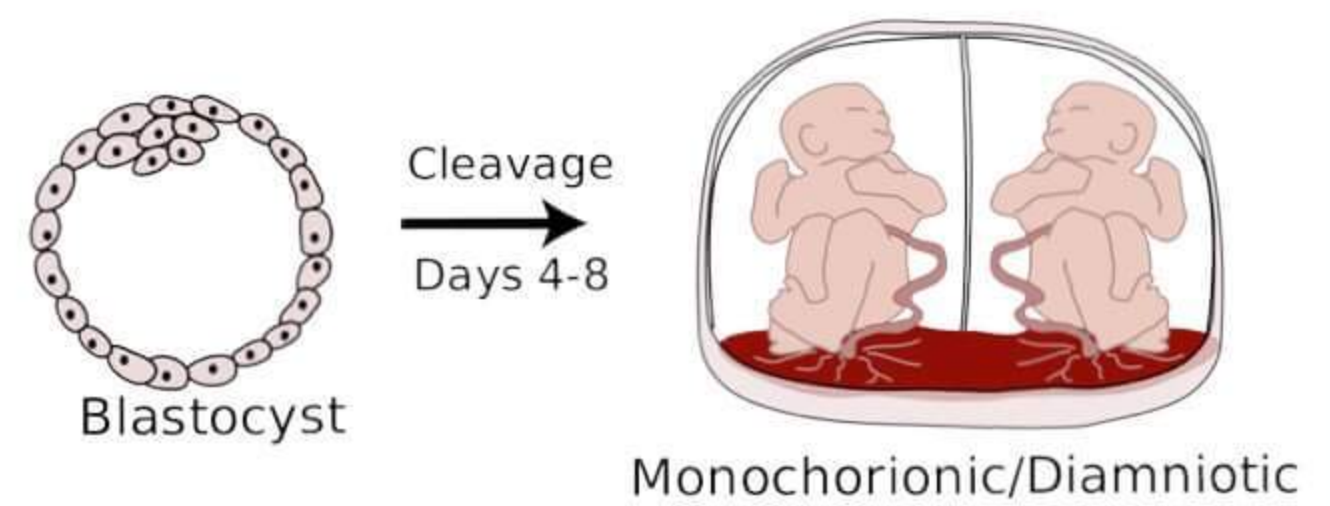
- 2 oocytes in 2 cycles
- Rare in humans, common in cattle & horses

FATE OF MONOZYGOTIC TWINS

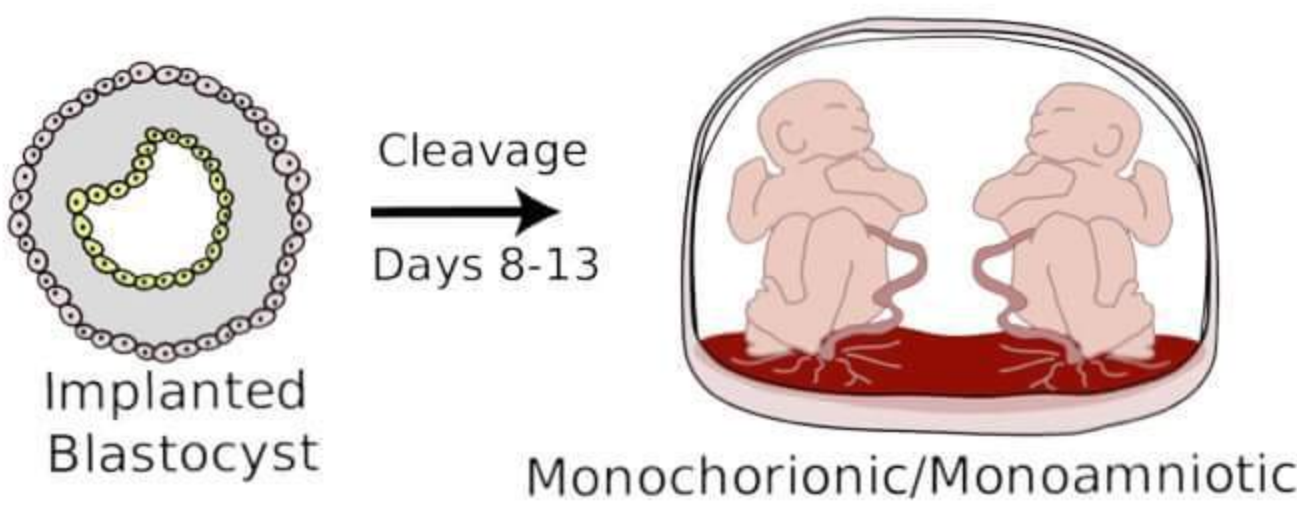
1 Dichorionic Diamniotic [35%]



2 Monochorionic Diamniotic



3 Monochorionic Monoamniotic



4 conjoined / Siamese



FATE OF DEIZYGOTIC TWINS → mly Dichorionic Diamniotic

BEST / LEAST COMPLICATED → DICHORIONIC DIAMNIOTIC

MONOZYGOTIC TWINS COMPLICATIONS

1 TWIN TO TWIN TRANSFUSION SYNDROME

- d/t deep AV anastomosis
- Hb difference → ≥ 5gm/dL
- wt difference → > 20%.

2 DISCORDANT TWINS

- Abdominal circumference → > 15%.
- wt difference → > 20%.

3 cord entanglement

4 Single fetal demise

5 Abruptⁿ

6 PROM

7 Sepsis

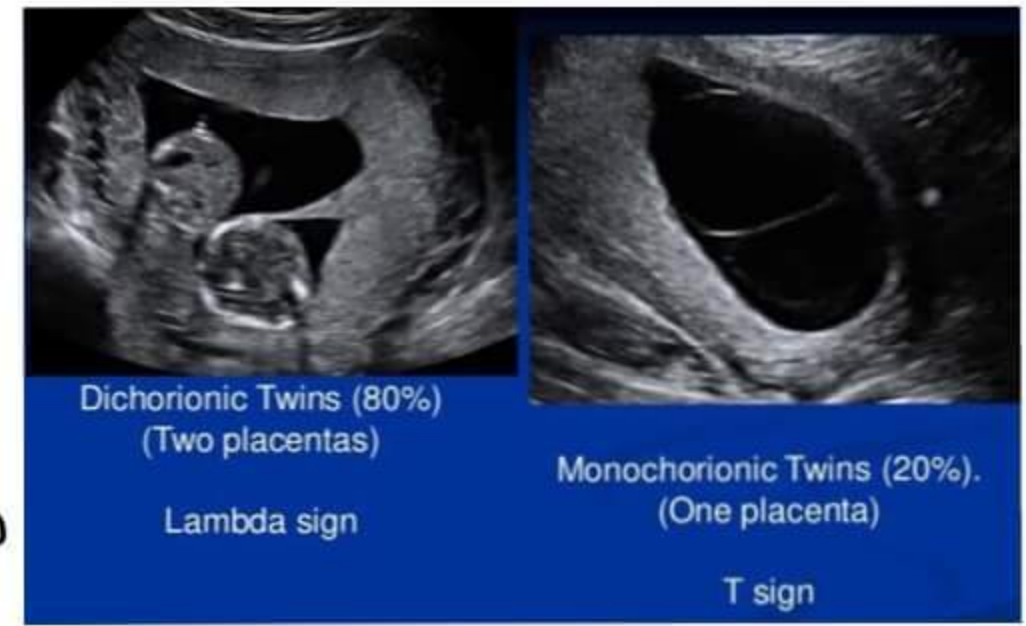
8. IUD OF one or Both fetuses

Terminatⁿ OF Pregnancy at 34 wks or even 32 wks [w steroids] By CESAREAN SECTION is advisable

CHORIONICITY SCAN

① Dichorionic Diamniotic

- 2 Placentas, 2 sacs
- 2 Different sexes
- **TWIN PEAK / LAMBDA SIGN**
- Inter twin membrane thickness → > 2mm



② Monochorionic Diamniotic

- **T SIGN**

TWIN TO TWIN TRANSFUSION SYNDROME MANAGEMENT

- Mortality dlt TTTS, if present at 26 wks or before → 100%
- Assess Deep AV Anastomosis by Fetoscopic / Doppler



Ablate the AV anastomosis ASAP

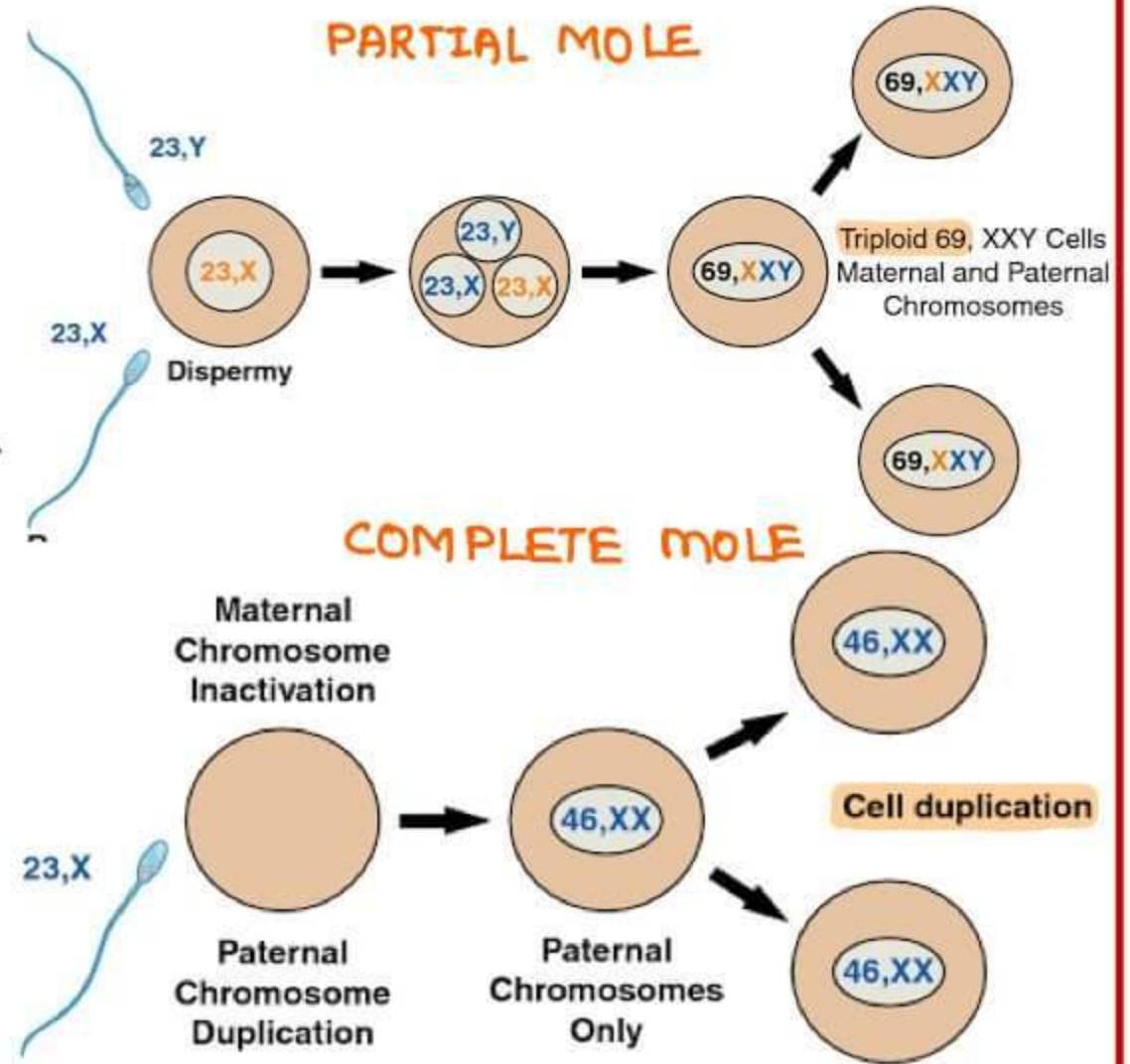
MODE OF PRESENTATION & DELIVERY

- Both Cephalic [>60%]
 - First cephalic, and breech
 - First Breech, 2nd breech
- } Normal vaginal delivery can be done
- Elective cesarean sectⁿ
 - Interlocking of twins is rare

MOLAR PREGNANCY

PARTIAL MOLE

- Non viable beyond 12-16 wks
- Almost no chance or 2-4% of choriocarcinoma
- can be 69xxx [mc], 69xyy, but never 69yyy



COMPLETE MOLE

TYPE 1

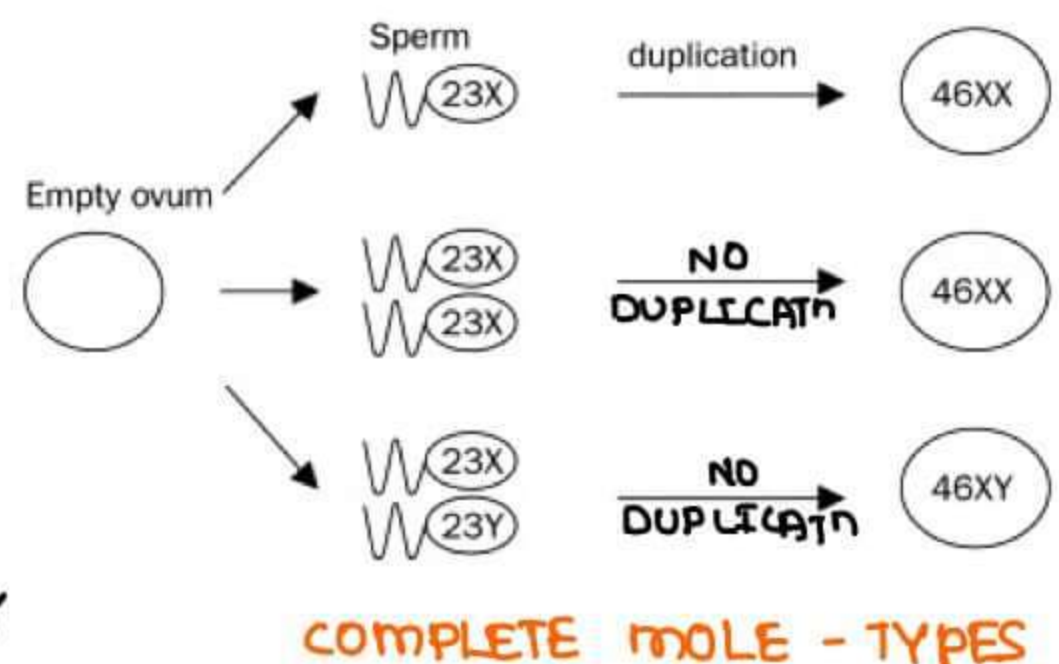
- Always happens w a Sperm of 23x
- Endoduplicatⁿ occurs
- Both chromosomes are of Paternal origin
- Aka Vesicular mole → SNOW STORM APPEARANCE in USG

TYPE 2

- Empty ovum fertilized by 2 Sperms of 23x each
- No duplicatⁿ occurs

TYPE 3

- Empty ovum fertilized by 2 Sperms of 23x & 23Y
- NO duplicatⁿ occurs
- Never be 23YY



PARTIAL MOLE	COMPLETE MOLE
→ Fetus present	→ No fetus
→ focal Trophoblastic hyperplasia	→ diffuse Trophoblastic hyperplasia
→ focal chorionic villi swelling	→ Diffuse chorionic villi swelling
→ scalloping of villi +nt	→ scalloping of villi absent
→ Trophoblastic stromal Includ ⁿ +nt	→ Trophoblastic stromal Includ ⁿ -nt
→ chance of Choriocarcinoma is 2-4%	→ chance of Choriocarcinoma is 20%

ASSOCIATED MORE WITH

- Asian / South East Asians [Rice eaters]
- vit A deficiency
- elderly Pregnancy

DIAGNOSIS

- 1 USG
 - 2 Flow cytometry
 - 3 Immunohistochemistry
- } more specific tests
- SF P57 is -ve → complete mole

PRESENTATION

INCOMPLETE MOLE → Missed Abortⁿ

COMPLETE MOLE

- ↑↑ HCG
- Thyrotoxicosis [Thyroid storm [↑PR, ↑Temp]]
 - Keep β blocker ready at evacuatⁿ

→ Hyperemesis

- Passage of grape like vesicles [Rare]
- Bleeding PV [mc Presentatⁿ]
- Uterus size → > POG
- Empty uterus [DOUGHY]
- Trophoblastic Embolizatⁿ
- Theca lutein cysts
- Early onset HTN

MANAGEMENT OF VESICULAR MOLE / COMPLETE MOLE

- Suctⁿ Evacuatⁿ [also do a Gentle curettage w/ a sharp curette]

↓

DO USG after a week to Rule out Retined Bits

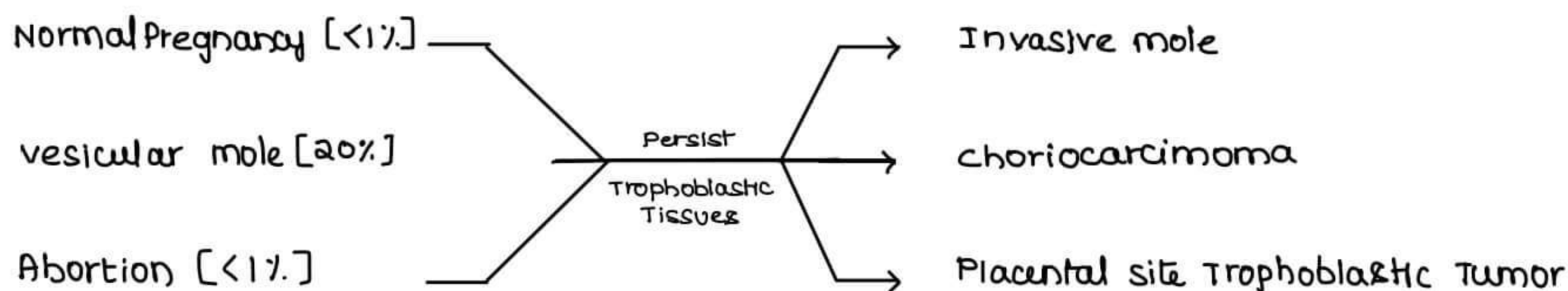
DO CXR to Rule out metastasis [mc site of metastasis → Lung]

HCG follow up

- weekly HCG estimatⁿ till negative
 - [vesicular mole takes 9 wks & partial mole takes 7wks]
- weekly HCG till 3 more wks
- Once in a month for 6 months [NO Pregnancy at this time]

BENIGN TROPHOBLASTIC CONDITIONS

GESTATIONAL TROPHOBLASTIC NEOPLASMS



EXCEPTION → Invasive mole does not follow a normal pregnancy

INVASIVE MOLE / CHORIOADENOMA DESTRUENS → produces HCG

- villi are preserved
- Sx is preferred Rx

CHORIOCARCINOMA → produces HCG

- No villi
- chemotherapy preferred
- Sx Rx if age is > 40 yrs

Placental site Trophoblastic Tumor

- Made by intermediate trophoblasts [cytotrophoblast] → Produce HPL
- Sx management should be done
- Human Placental Lactogen follow up done

CHORIOCARCINOMA

- ↑ HCG at Dx [$>10^5$]
 - Uterine size → Big
 - > 6cm Theca Lutein cyst
- } ↑ chance of choriocarcinoma

20%	OF vesicular moles will become choriocarcinoma
<1%	OF Normal pregnancy will become choriocarcinoma
<1%	OF Abortions will become choriocarcinoma
50%	OF choriocarcinomas follow vesicular mole
25%	OF choriocarcinomas follow Normal Pregnancy [WORST PROGNOSIS]
25%	OF choriocarcinomas follow Abortion

→ WHO PROGNOSTIC SCORE

- Antecedent Pregnancy
- HCG
- Size of Tumor
- Chemotherapy [No. of Drugs]
- Age
- Metastasis
- Metastasis
- Time Interval after m_x of vesicular mole
- Blood Group

BAD PROGNOSIS

- Normal pregnancy
- 10^5 or more
- > 5cm
- > 2
- > 39 years
- at the time of diagnosis
- in Liver & Brain
- Longer
- B

- score ≥ 7
- Management
 - < 7
 - Poor Prognosis
 - Single Agent [Methotrexate / Actinomycin]
 - Combo [MTX + Actinomycin + cyclophosphamide]
 - ≥ 7
 - ETOPOSIDE
 - MAC [MTX + Actinomycin + cyclophosphamide]
 - ONCOVIN

STAGING OF MOLAR DISORDERS

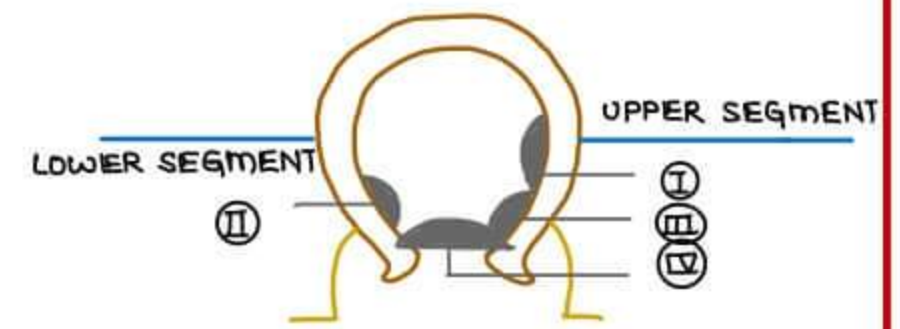
- Stage I → within uterus
- Stage II → In Pelvis, vagina [Do not take biopsy until HCG done]
- Stage III → Lung
- Stage IV → Distant Metastasis

→ Any bleeding in the genital tract after >28 weeks of gestation

PLACENTA PREVIA [PP]

CLASSIFICATION

- I → Dips into the Lower segment
 - II → in the LS but do not cover OS
 - III → Partially covering the OS
 - IV → Fully covering the OS
- } Minor degree
- } Major degree



MORE ACCEPTED CLASSIFICATION

- PLACENTA PREVIA → Internal OS is partly or completely covered
- LOW LYING PLACENTA → Placenta in the lower segment but within 2cm of internal OS

PRIMARY MANAGEMENT IN ALL THESE CASES IS RESUSCITATION

CASE 1 → PP → Painless bleeding at term [>37-40 wks], Management?
 Mx → Cesarean Section

MOST CASES OF PP DOES NOT BLEED AT THE TIME OF PRESENTATION

CASE 2 → PP at term [not bleeding], Management?
 Mx → ① TYPE IV [complete / Total] → Cesarean Section

② TYPE III [Incomplete]

- DOUBLE SET UP EXAMINATION / Examination under anesthesia
- under anesthesia,
- Drape the patient, keep another surgeon ready
- DO per vaginal examination

- ↓
- Placenta moved away → Normal vaginal delivery
- Placenta not moved away → Cesarean Section

③ TYPE II

- a. Anterior low lying placenta → Normal Vaginal delivery
- b. Posterior low lying placenta → Cesarean Section
- [Dangerous Placenta Previa]

④ TYPE I

→ Normal vaginal delivery

CASE 3 → PP Bleeding, <34 wks [Lung not matured]. Management?
 Mx → 1. Resuscitation
 2. Steroids to the baby
 3. Sedate

} **MCAFFEE JHONSON REGIME**
 BLEEDING STOPPED IN 90% OF CASES

→ Bleeding does not stop [10%.]

→ cesarean section

→ NO TOCOLYSLS

ABRUPTIO PLACENTA / ACCIDENTAL HAEMORRHAGE

ASSOCIATED WITH

- Hypertension, Pre eclamptic Toxemia
- smokers
- Multiparous women
- Twins
- Pre Mature Rupture of membranes
- Chorioamnionitis
- Previous abruptⁿ
- Thrombophilias
- Elderly women

SHER & PAGE CLASSIFICATION

TYPE I

- Bleed seen only after delivery
- No uterine tenderness
- fetus is alive & FHR is (N)

TYPE II

- Bleed seen during labour
- associated ± uterine tetany
- Fetal Heart Rate - Normal

TYPE III

- most severe
- FHR Problem, distress
- A → without DIC
- B → with DIC

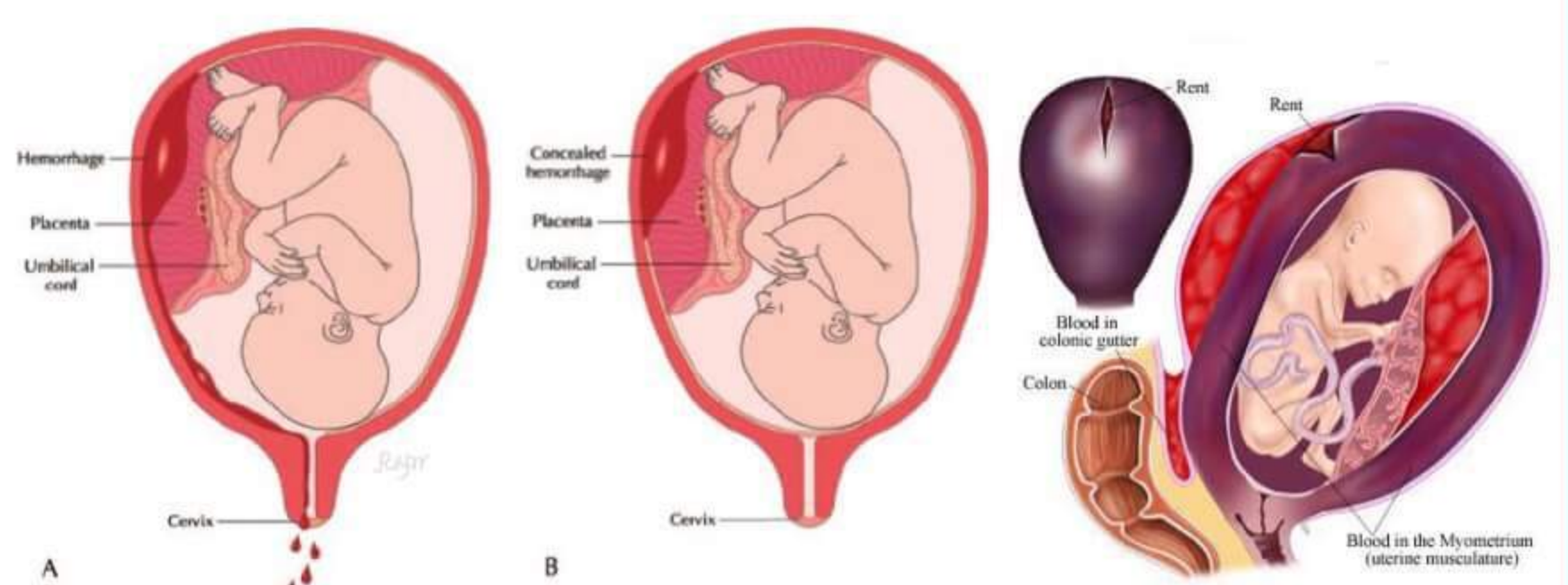
PRESENTATION

- Painful bleeding
- Protractⁿ of labour
- PPH

MANAGEMENT

I. AT TERM

- Resuscitatⁿ
- IF fetal distress +nt
 - FHR <110 on doppler
 - fetal scalp blood PH is <7.2



REVEALED

CONCEALED

COVULAIRE | BRU-ISED UTERUS

→ cesarean sectⁿ

- Abruptⁿ per se is not a indicatⁿ for cesarean section → NORMAL DELIVERY
- Loss of fetal movements
Inability to localize FH sounds } NOT FETAL DISTRESS

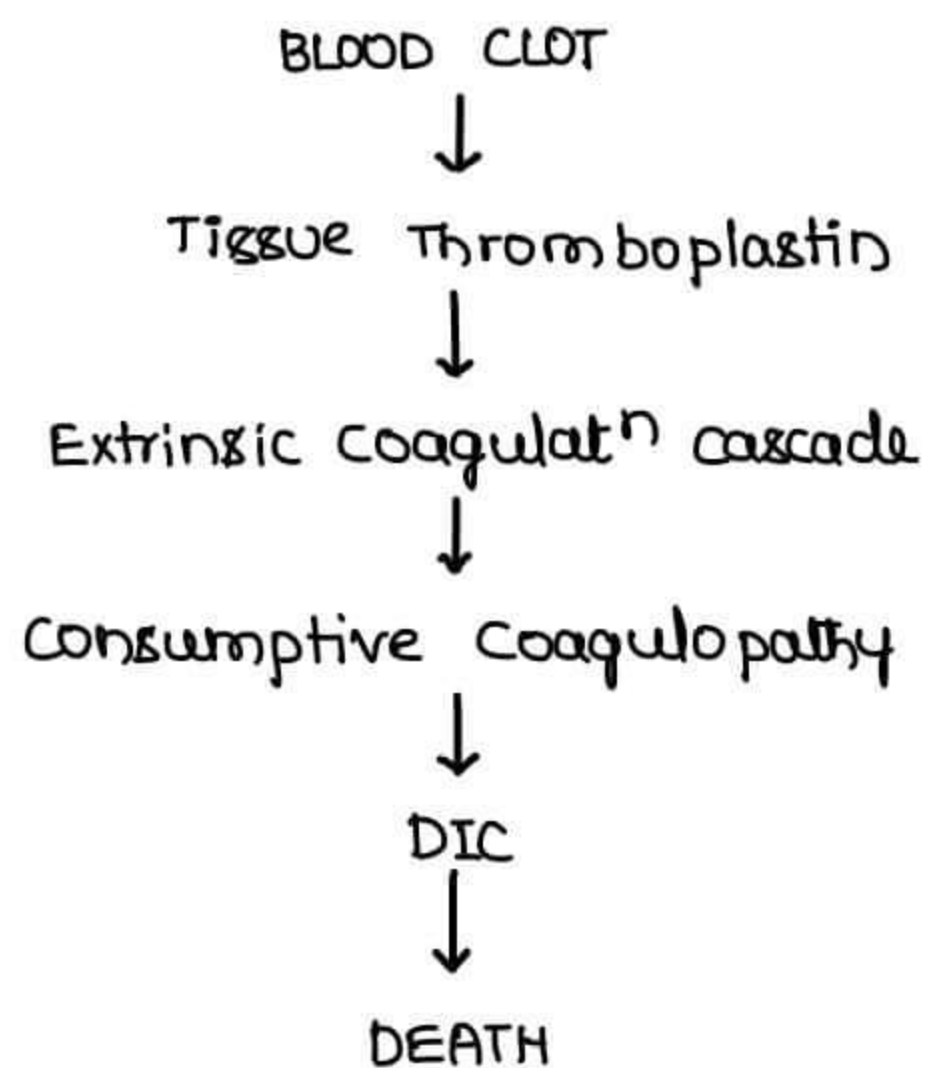
NORMAL DELIVERY IN ABRUPTION

- By Artificial Rupture of membranes
 - Local prostaglandins are released → Induce labour
 - The compression stops the bleeding
- can also add OXYTOCIN → Augments labour

2. AT 32 WEEKS

1. Resuscitation
2. Steroids to baby
3. Sedation

→



4 DO ARM & Deliver the Baby

→ NO TOCOLYSIS

NO TOCOLYSIS IN APH

Placenta Previa
Abruptio Placenta
Vasa Previa

Only conditⁿ in APH where conservative Mx is useful, <34WK → Placenta Previa

EXCEPTIONS/CONTRA INDICATIONS

- Intra Uterine Death
- Anomalous Baby
- Severe shock of mother

Q Placenta Previa, 32 weeks of Gestatⁿ i pre term labour.

- (A) Tocolysis can not given
- (B) Tocolysis can be given

A. IF no bleeding in placenta previa, tocolysis can be given

HYPERTENSIVE IN PREGNANCY

- After 20 weeks of gestation, in a previously normotensive, BP $> 140/90$, in > 2 occasions > 6 hrs apart.

PRE ECLAMPTIC TOXEMIA [PIH - earlier name]

- Hypertension with Proteinuria > 300 mg/24 hr urine or 1+ in dipstick
Protein: creatine Ratio ≥ 0.3

ECLAMPSIA

- Pre Eclamptic Toxemia with Generalized Tonic clonic convulsions
- **PREDISPOSING FACTORS FOR SEVERE HTN or IMMINENT ECLAMPSIA**
 - Headache
 - Nausea/vomiting
 - Blurring of vision
 - \uparrow Knee jerks
 - Epigastric Pain
 - Proteinuria $\rightarrow > 2$ gms/24 hrs urine [> 3.5 g - nephrotic range]
 - BP $\rightarrow > 160/110$ mm Hg

PRE EXISTING HTN

- \rightarrow Essential HTN
- \rightarrow Chronic HTN
 - Renal Artery stenosis
 - Pheochromocytoma
- \rightarrow Acute on chronic HTN
 - Platelets $\rightarrow < 100,000$
 - creatinine $\rightarrow > 1.1$
 - New onset Proteinuria
 - Transaminases > 2 times
- \rightarrow Delta HTN
 - BP is normal through out the pregnancy and it reaches high normal values in the later stage of pregnancy
 - can be associated \bar{c} convulsions

- DOC → $MgSO_4 \cdot 7H_2O$ → IM + IV [PRITCHARD'S REGIME - MOC]
 → IV only [ZUSPAN REGIME]

→ PRITCHARD'S REGIME

- IV $MgSO_4$ 4 gms
- IM $MgSO_4$ 10 gms [5gms in each buttock]
- IV $MgSO_4$ 2 gms added if no relief
- Follow up \bar{z}
 - IM $MgSO_4$ for 24 hrs after the last convulsion or the delivery whichever is later
 - monitor knee jerks → +
 - Respiratory Rate → $> 14/\text{min}$
 - Urine output → $> 100 \text{ ml} / 4 \text{ hrs}$

- DELIVERY is the most important step in the Mx of Eclampsia
 90% or more are normotensive \bar{z} in one week of delivery

- Add IV LABELOLOL → DOC of Hypertensive emergencies in pregnancy

- 20 mg iv over 10 min

↓

another 20/40 mg

↓

80 mg in 10 min

↓

upto 220 mg

- $\alpha + \beta$ Blocker [LABETALOL]

- IV HYDRALAZINE

- 5 to 10 mg IV Bolus
- Alternative to Labetalol

- GUEDEL'S AIRWAY

- Prevents the tongue bite
- maintains the oxygenatⁿ
- Do not use mouth gags, etc

HYPERTENSION MANAGEMENT

- Tab. LABETELLOL
 - 1st line drug
 - 100 - 200 mg TID
 - α + β blocker

- Tab. METHYL DOPA
 - Prodrug
 - Active form → α Methyl Norepinephrine
 - 250 - 500 mg QID.

- Tab. HYDRALAZINE
 - 25 - 50 mg BD or OD
 - Arteriolar dilator

- Tab. NIFEDIPINE
 - S/L Nifedipine is C/I
 - 10 mg TID [upto 80 mg/day can be given]

- Tab. PRAZOSIN
 - α Blocker
 - 2.5 - 5 mg / day

CONTRA INDICATED DRUGS

- FRUSEMIDE } cause Intra Uterine Growth Restrictⁿ
- β Blockers }
- ACE INHIBITORS }

- ACE Inhibitors can cause
 - Hypocalvaria
 - Renal Agenesis
 - Oligoamnios



- ETIOLOGY OF HTN
 - > 20 wks, Trophoblastic invasion & Replacement of Smooth muscle layer } (N)
 - Persistence of smooth muscle layer or inadequate trophoblastic invasion } vaso-spasm
 - VASOSPASM [Pathology] → HTN [PIH]
 - AS Furosemide → ↑ VASOSPASM → contraindicated
 - Normal SALT DIET

- Anti hypertensive drugs have to be started → $\geq 150/100$

OTHER ASSOCIATIONS OF PIH

- 1st exposure to villi [Primi]
- more exposure to villi [Twins, molar Pregnancy]
- Pre existing endothelial damage
 - Renal Disease
 - DM
- Genetic Predisposition
 - Altered Methyl Tetra Hydrofolate gene
 - Factor V leiden abnormality
- ↓ Nitric Oxide Production from L. Asperginase by endothelium

PREDICTION OF HTN

- ROLL OVER TEST - >10mm Hg increase
- ISometric Exercises
- ↑ Uric Acid
- ↓ calcium
- ↑ Homocysteine
- Microalbuminuria

PREVENTION

- calcium supplementatⁿ
- fish oil capsules
- Low dose Aspirin [75-150 mg]
- Antioxidants [vit c/D/E]

WHITES CLASSIFICATION

GESTATIONAL DM [A]

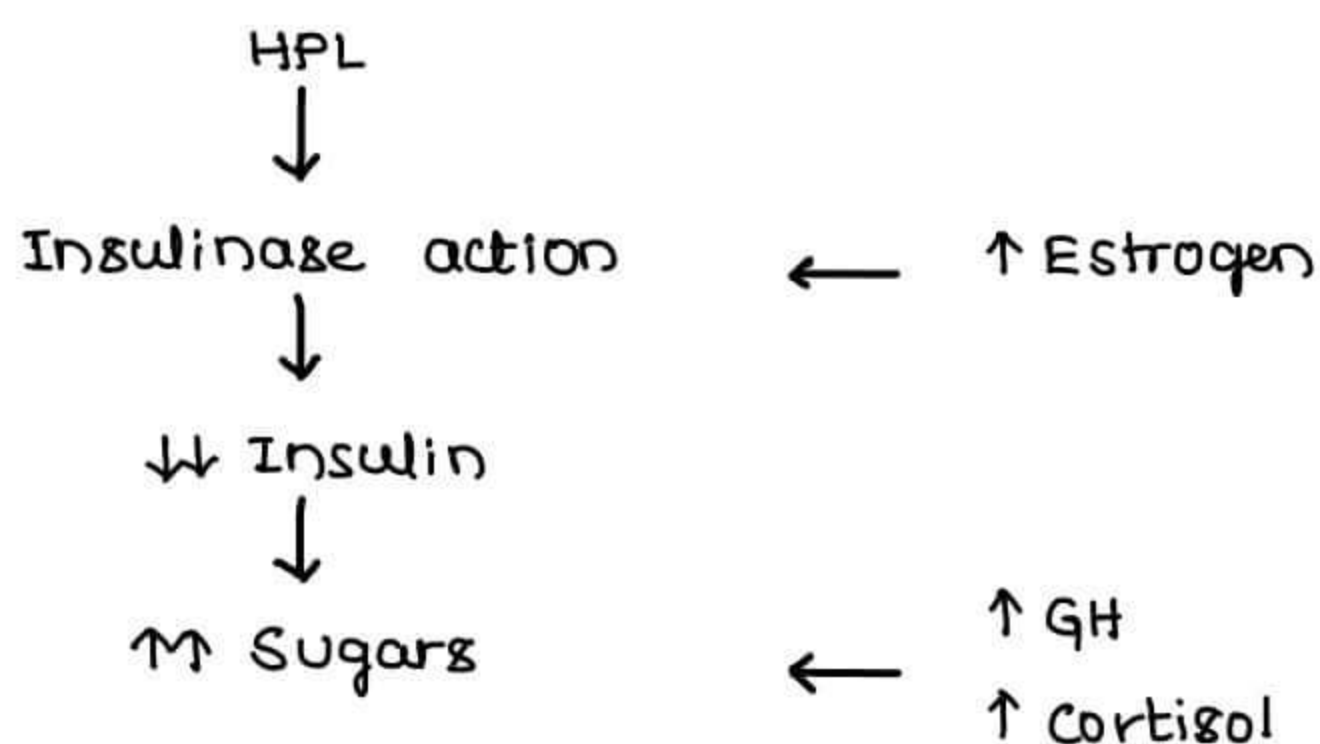
- A₁ → sugar controlled \bar{c} diet
- A₂ → Sugar controlled \bar{c} insulin

PRE GESTATIONAL DM

- B → <10 yrs of duration
- C → 10-19 yrs of duration
- D → >20 yrs of duration
- F → associated \bar{c} nephropathy
- R → associated \bar{c} Retinopathy
- H → associated \bar{c} Heart disease

GESTATIONAL DM

→ At 24 WKS, Human Placental lactogen made from Placenta



→ NO Anomalies [Organogenesis over]

→ Screening of GDM

- After 24 weeks
 - Glucose challenge Test \bar{c} 50gms of sugar in a non fasting women
Screening Test [obsolete now]
 - Glucose Tolerance Test \bar{c} 100gms of sugar in a fasting women
Diagnostic test [obsolete now]
 - 1 STEP TEST [Screening & Diagnostic test Now]
 - Glucose Tolerance Test \bar{c} 75gms of sugar in a fasting women
 - Fasting → < 92
 - At 1 hr → < 180
 - At 2 hrs → < 153
- } Any one abnormal value is Dx of GDM

PRE GESTATIONAL DM / OVERT DM

→ 1st Trimester sugars \propto Anomalies

- Screening for DM should be done in 1st trimester itself

Screening done by

- Glycosylated Hb → < 6.5
- Serum fructosamine → 258 - 288 μ mol

MATERNAL COMPLICATIONS

- Large Baby → ↑ cesarean sectⁿ
 ↑ Instrumentatⁿ
 ↑ Birth canal Injuries
 Shoulder dystocia
- Polyhydramnios → PROM → chorioamnionitis
- Puerperal Sepsis
- Preterm labour
- Association ↑
 - PIH [25%]
 - Abruptio
 - Sudden intra uterine Death at term

NEWBORN COMPLICATIONS

- Hypoglycemia
- Hypomagnesemia
- Hypocalcemia
- Polycythemia
- Hyperbilirubinemia
- Anomalies
 - cardiac [mc]
 - Transpositⁿ of Great vessels [mc & most specific]
 - VSD
 - PDA
 - Neural tube defects
 - Anencephaly
 - Spinal Bifida
 - facial defects - cleft palate, cleft lip
 - Sacral Agenesis / caudal Regression syndrome [most specific]

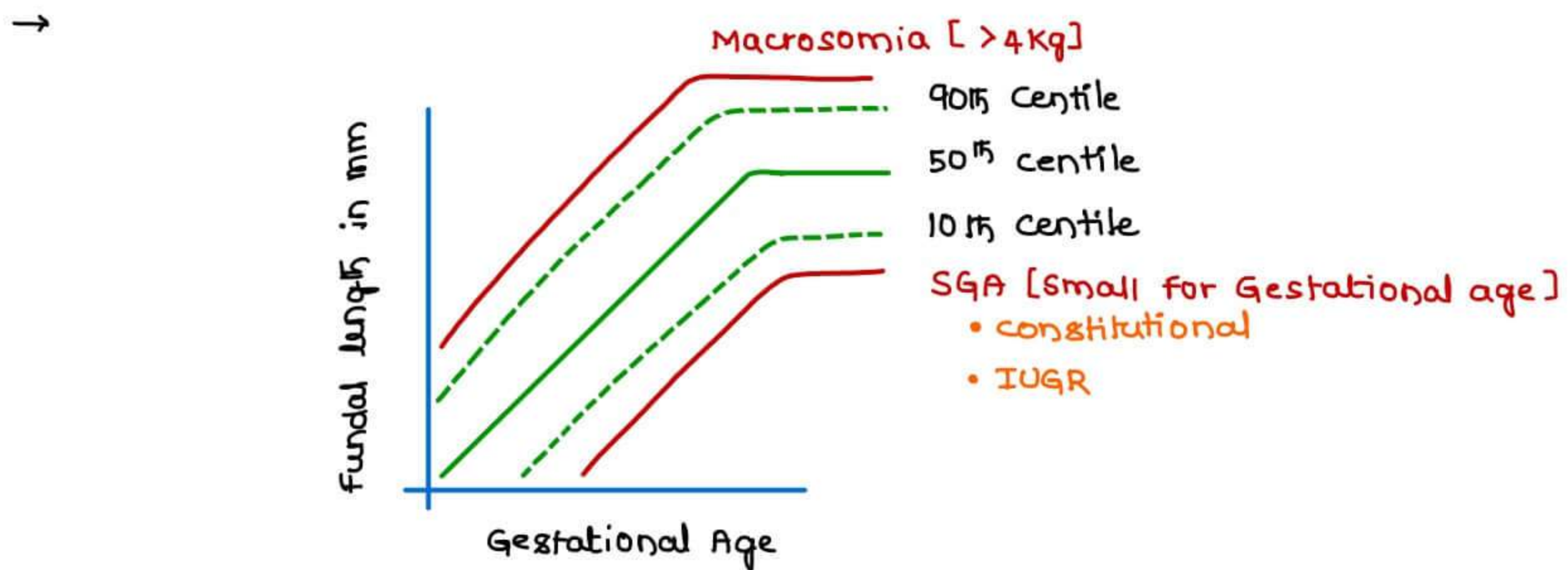
FETAL COMPLICATIONS

- ↑ SUGARS → ↑ Insulin from Pancreas → hypoglycemia
 [β cell Pancreatic Hyperplasia]

MANAGEMENT

- Diet → 25-30 K.cal / Kg/D [Ⓝ requirement → 35-40 K.cal / Kg/D]
- Monitor sugars → Fasting / Post breakfast / Post Lunch / Post Dinner
- Monitor fetus → Antepartum Surveillance
- Plan Delivery → by 38WKS & Give Steroids
- DOC → Insulin
- OHA → GLYBURIDE [Glibenclamide]
- [oral Hypoglycemics] → METFORMIN
- Fundus EXAM → Look for Retinopathies
 - Background [80%]
 - Proliferative [20%] → c. section [Neovascularizatⁿ]

→ clinical lag of 2-3 weeks fundal height corresponding to Gestational age



→ Weight $< 2.25\text{kg}$ [2.3kg] & Femoral length [FL] : Abdominal circumference Ratio $\cong 22$ after 21 weeks (N)
 → > 23.5 → SJO IUGR

→ 1st Parameter affected during Growth restrictⁿ → Abdominal circumference
 2nd Parameter affected during Growth restrictⁿ → Upper & Lower limbs
 last Parameter affected during Growth restrictⁿ → Brain [dit preferential circulation]

SYMMETRICAL IUGR / TYPE I	ASYMMETRICAL IUGR / TYPE 2
→ Early onset	→ Late Onset
→ dit Infections chromosomal disorders congenital anomalies	→ dit HTN Renal Disease
→ PONDEREL INDEX → 8.3 (N) Estimated fetal weight / FL ³	→ PONDEREL INDEX → < 7
→ HC/AC → 1 (N)	→ HC/AC → > 1
→ Poor Prognosis	→ Better Prognosis

ETIOLOGY

→ IDIOPATHIC [65%]

Maternal causes

→ chronic Kidney Disease, HTN, Infections, connective tissue disorders, Heart Disease [III, IV], Smoking, Drugs, Alcohol, BURNT OUT DM [micro angiopathy]

Placental causes

→ Placental Infarcts, Abnormal Placentas, Abnormal Placentation

fetal causes

→ Inborn Errors of metabolism, chromosomal anomalies, infections

Antepartum

- Oligoamnios
- Hypoxia
- Still Birth

Intrapartum

- Hypoxia
- Acidosis

NEONATAL COMPLICATIONS

- Limp, Loose skinned, Thin, Poor tone
- Respiratory Distress Syndrome
- Intra ventricular Haemorrhage
- Neonatal Death
- Persistence of Primitive circulatⁿ

MANAGEMENT

→ NOT THE TREATMENT

- ↑ Diet
- Protein Powders
- Stopping to smoke
- Stopping to Drink
- Stop Using Drugs

TREATMENT

- RESTING IN A LATERAL POSITION [Only Proven method, which ↑ the weight]
- ↑ SURVEILLANCE
- ADEQUATE DIET for required women
 - calories → 35 - 40 Kcal / Day
 - carbohydrates → 50%
 - Proteins → 30%
 - fats → 20%

ANTEPARTUM FETAL SURVEILLANCE IN HIGH RISK PREGNANCY

TOOLS

Daily Fetal Movement count [DFMC] → > 10 / 12 waking hours

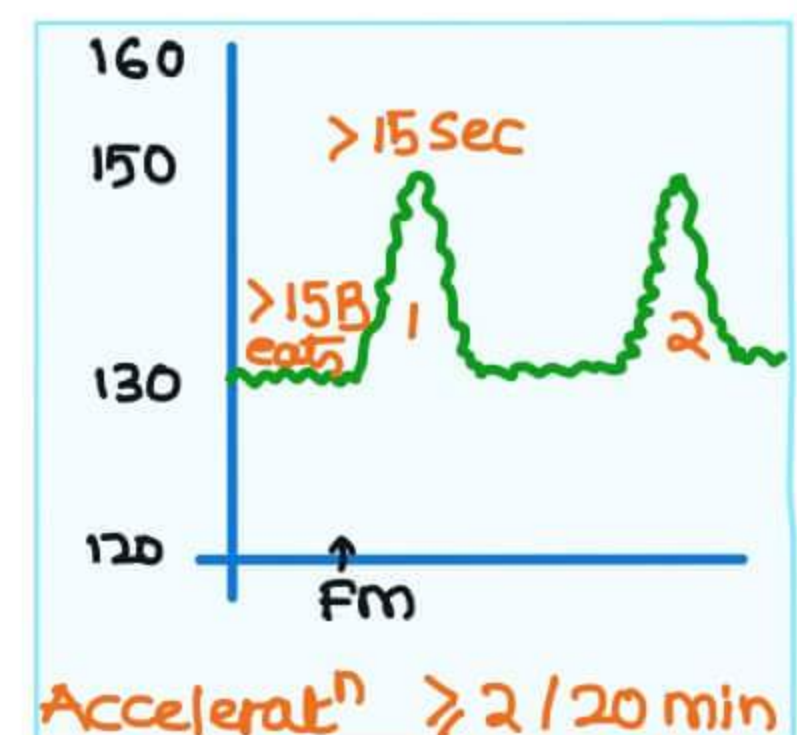
Non Stress Test

→ Sympathetic vs Parasympathetic system well being

- established at 28 WKS
- Test will be done 32 WKS onwards

→ REACTIVE NON STRESS TEST

- ≥ 2 accelerations, > 15 Beats from base line, > 15 seconds in 20 minutes
- chance of IUD → < 1% / next 1 week

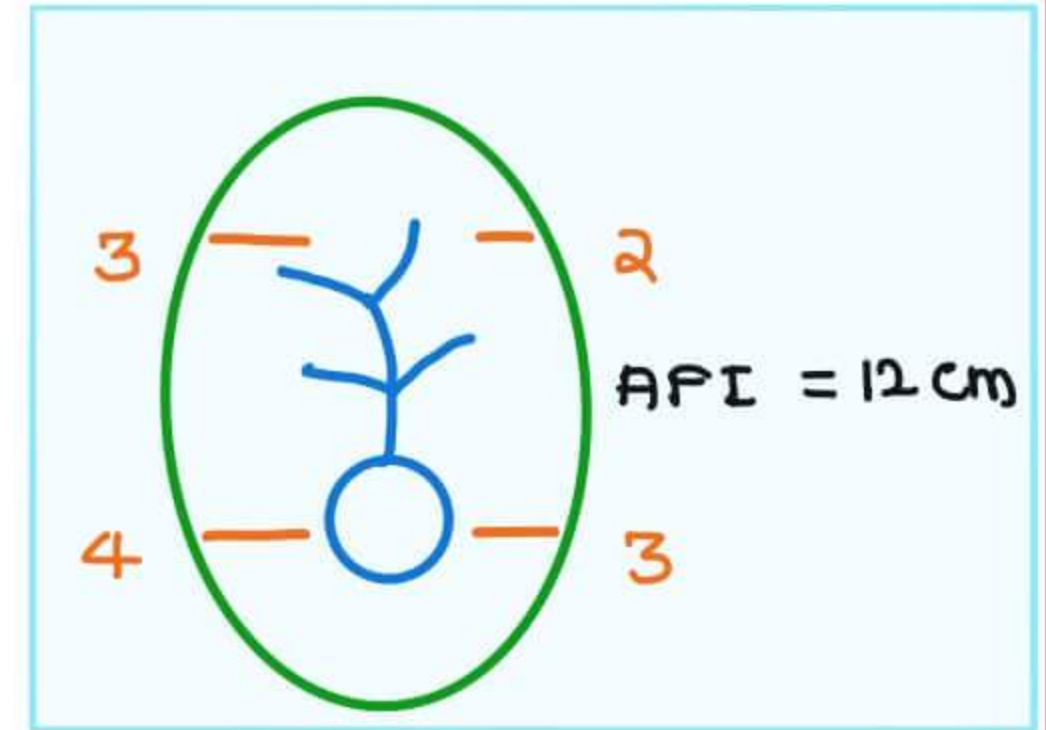


→ FREQUENCY OF NST

- Weekly after 32 wks, for all pregnant ♀
- Biweekly for high risk pregnancies
- 1/48 hrs For controlled DM & severe HTN
- Daily For uncontrolled DM

BIO PHYSICAL PROFILE / MANNING SCORE

- Done by USG
- fetal movements → 2
- fetal tone → 2
- fetal breathing movements → 2
- Adequate NST → 2
- Amniotic Fluid Index → 2
- GOOD BIOPHYSICAL PROFILE → 10



AMNIOTIC FLUID INDEX

- Arithmetic sum of 4 cord free pockets
- Normal → 10 - 15 cm
- Oligoamnios → < 5 cm
- Polyhydramnios → > 24 cm

ABSOLUTE AMOUNT OF LIQOR

- Normal → 1000ml
- oligoamnios → 500ml
- Polyhydramnios → 2500 ml

SINGLE POCKET

- Oligoamnios → ≤ 2 cm
- Polyhydramnios → > 8 cm

EXTERNAL CEPHALIC VERSION DONE AT

- For Primigravida at → 36 wks
- For Multi gravida at → 37 wks

30wks * BREECH
32wks 1000ml liquor
36wks ECV → ✓
36wks 800ml
40wks 600ml liquor

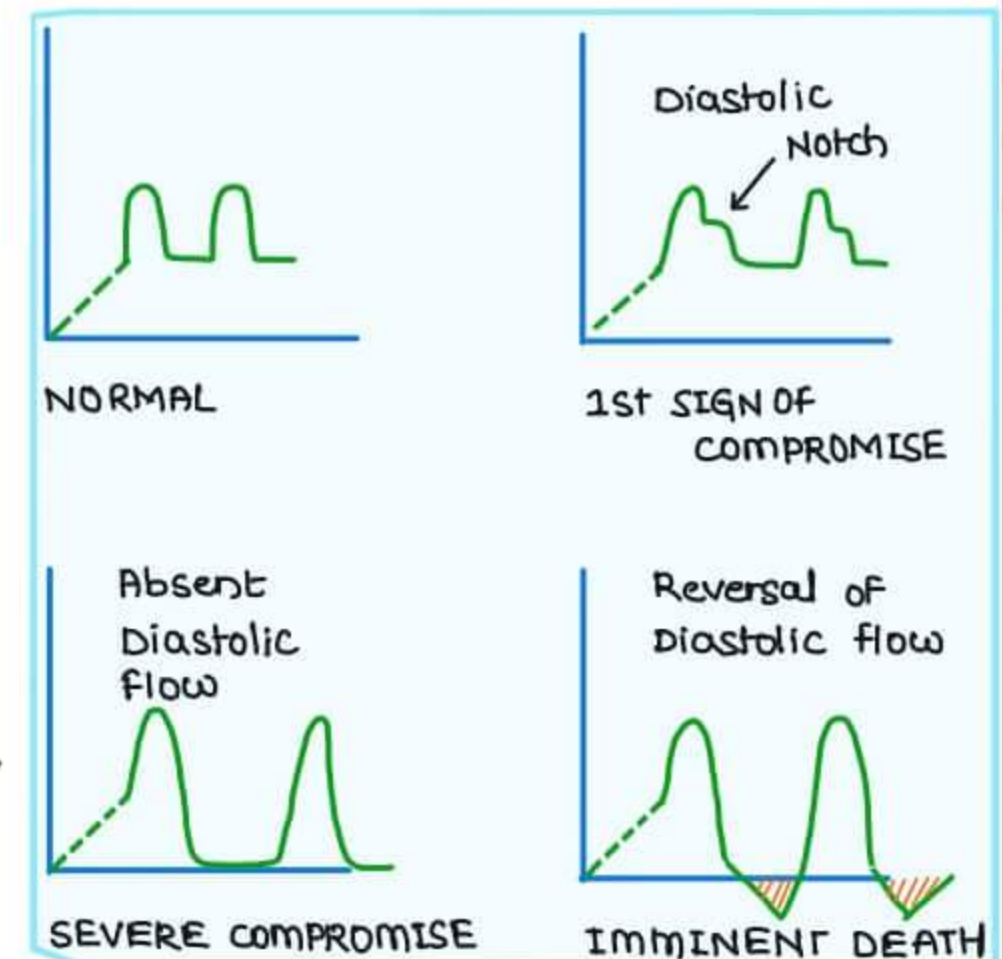
MODIFIED BIO PHYSICAL PROFILE → Includes AFI & NST

VIBRO ACOUSTIC STIMULATION TEST

DOPPLER OF

- Umbilical arteries
- Uterine arteries
- Ductus Venosus

→ Most important Doppler for assessment of uteroplacental flow } UMBILICAL ARTERY DOPPLER



→ Which of the following flow patterns done by Doppler assessment will best signify Perfusion to the baby → DUCTUS VENOSUS FLOW PATTERNS > UMBILICAL ARTERY DOPPLER

→ Tells us the plausibility of doing a normal vaginal delivery

INTRAPARTUM SURVEILLANCE

Fetal HR → by Stethoscope
 → by Doppler

Fetal scalp Blood PH → > 7.2

Fetal ECG

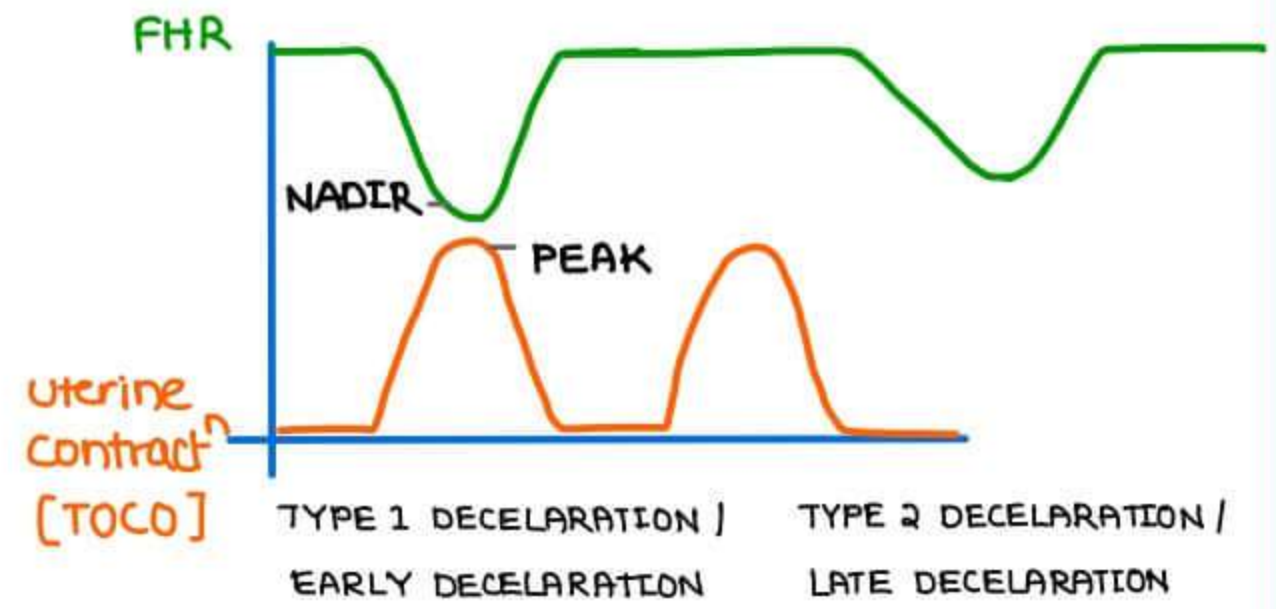
- 1 Probe ECG → ST wave Analysis [STAN]
- 2 Probe ECG

CARDIOTOCOGRAPHY

→ Single best test for monitoring labor

→ TYPE 1 / EARLY DECELERATION

- The Nadir of FHR & Peak of uterine contractⁿ close to each other
- Seen in Normal Pregnancies
- onset of deceleratⁿ & coming back to normal → > 30sec

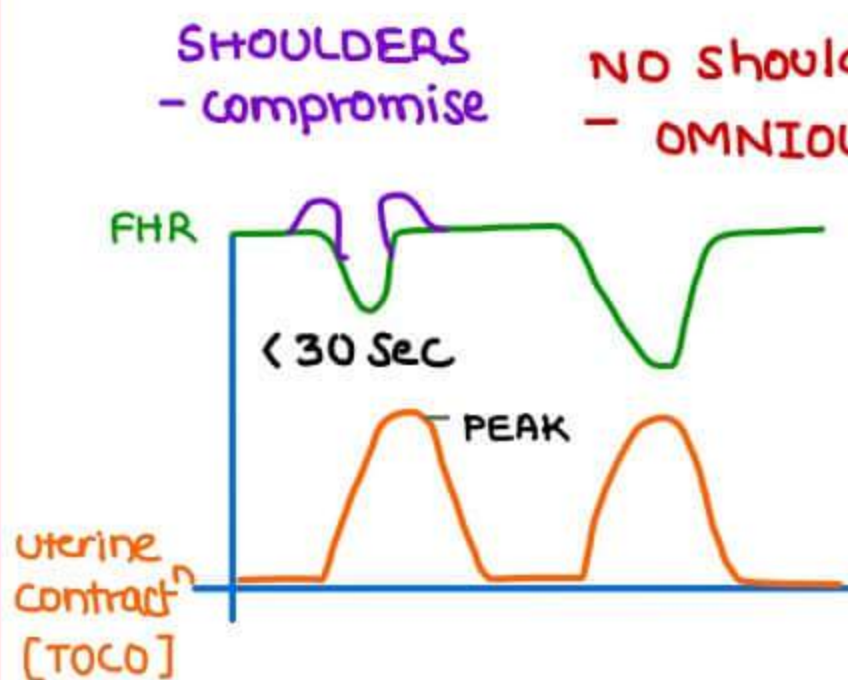
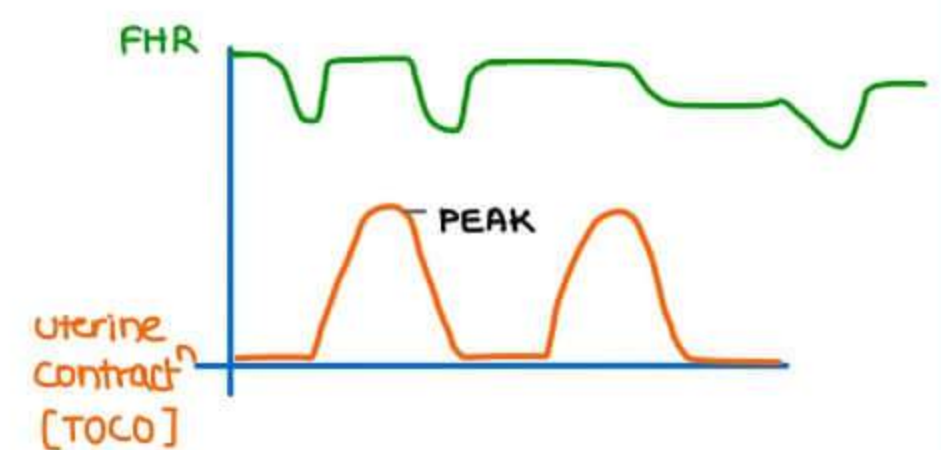


→ TYPE 2 / LATE DECELERATION

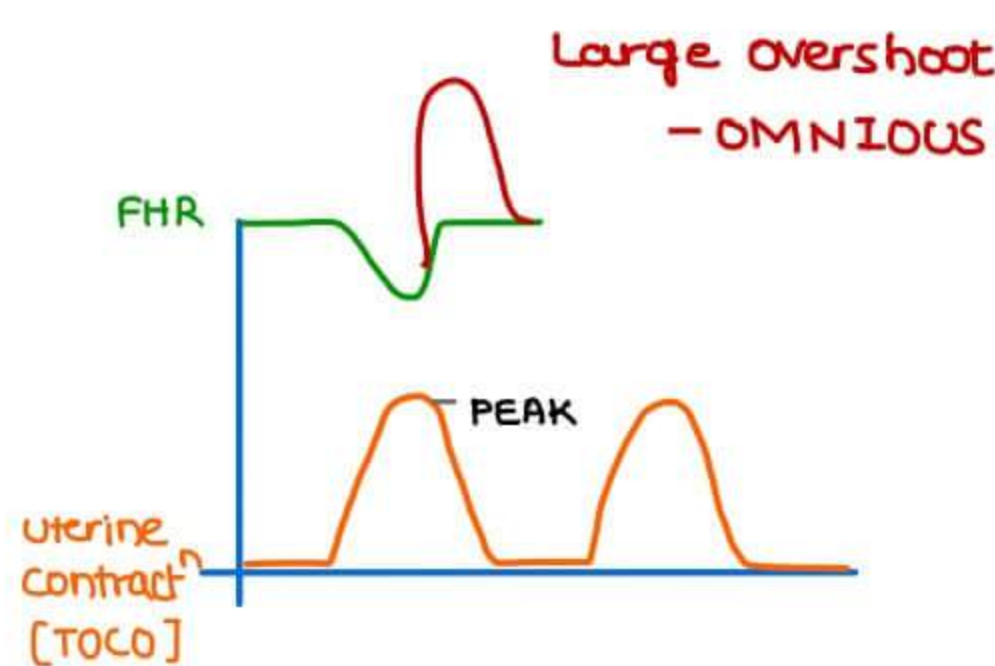
- The Nadir & Peak are away from each other
- Seen in Placental insufficiency
- onset of deceleratⁿ & coming back to normal → > 30sec

→ VARIABLE DECELERATION

- Most common deceleration
- dlt umbilical cord compression
- More Patterns



NO shoulder - OMNIOUS



3-5 cycles / min - omnious



SINE WAVE [SINUSOIDAL]

dlt Fetal anemia

Mx → c. sectⁿ

HEART DISEASES

RHEUMATIC HEART DISEASE [RHD]

- MC heart disease in INDIA
- Mitral stenosis [MC Presentatⁿ]
 - Failure → Antenatal [around 30-32 wks] [mjc] → CO ↑ by 50%
 - Postnatal → 1st 24 hrs → CO ↑ by 70-75%
 - Balloon Mitral valvotomy in 2nd trimester can be done antenatally
 - Post natally → Keep in High risk ward [for 1st 24 hrs]
 - 9nj. Lasix → ↓ Preload

OBSERVATION PERIOD REQUIRED POST NATALLY FOR HEART DISEASE → 1st 24 hrs
 OBSERVATION PERIOD REQUIRED POST NATALLY FOR PPH → 1st Hour

→ Labour Inductⁿ is safe in most of the Heart Diseases
 Normal Delivery can be done.

Cesarean sectⁿ Indications

- Obstetric Indications
- Aortic root dilatations → > 4cm
- Aortic Aneurysms
- Severe Aortic stenosis
- Recent MI
- congestive Heart failure
- Warfarin Rx in previous 2 wks

LABOUR MANAGEMENT

- ↓ IV Fluids
- Position → SEMI RECUMBENT
- PAIN RELIEF
 - Opioids
 - Epidural Analgesia
- Avoid straining in 2nd stage
 - cut short it by forceps/vacuum
- 1nj furosemide → ↓ Preload } Given
 IV/IM Oxytocin }
 Methy Ergometrine → contraindicated
- observatⁿ in High Risk ward for 24 hrs
 Do not discharge for 5 days

DELAYED COMPLICATIONS

- Arrhythmias
- cardiac rupture
- Infective Endocarditis
- Thrombo Embolic Phenomenon
- Mitral valve Prolapse

CONTRA INDICATIONS TO PREGNANCY

- Eisenmenger Syndrome
- Severe Aortic Stenosis
- Primary Pulmonary HTN
- Marfan Involving Aortic Root

COARCTATⁿ OF AORTA IS NOT A CONTRA INDICATION → c. sectⁿ indicated

HYPOTHYROIDISM

VALUES

- TSH → < 2.5
- [2.5 - 4.0] → check Anti Thyroid Peroxidase
- IF +ive → start ELTROXIN

MATERNAL COMPLICATIONS

- Abortion
- Preterm labour
- Preeclamptic toxemia
- Abruptio
- PPH

NEONATAL COMPLICATIONS

- Morbidity & mortality ↑
- Cretinism
- ↓ IQ
- Neuro Psychiatric illness
- Poor cognitive development
- Deafness & Growth Restriction

HYPERTHYROIDISM

MATERNAL COMPLICATIONS

- Pre Eclamptic Toxemia
- Thyroid storm
- Preterm labour
- High output cardiac failure
- Intra uterine Growth Restrictⁿ
- Intra uterine Death

MANAGEMENT

- DOC → PROPYLTHIOURACIL 100 - 150 mg TID
- METHIMAZOLE [from 2nd Trimester]

EPILEPSY

- 30% have ↑ convulsions
- 20% have ↓ convulsions
- 50% have unchanged convulsions

MANAGEMENT

- PHENOBARBITONE → not given
- PHENYTOIN } Given, but CATEGORY D Drugs → FETAL HYDANTOIN SYND.
- CARBAMAZEPINE }
- LAMOTRIGINE [DOC] } CATEGORY C Drugs
- LEVITIRACETAM }

- Poor Prognosis
- ↑ Risk for fulminant hepatic failure
Intra Uterine Death

MANAGEMENT

- DOC → CHLOROQUINE
- complicated Malaria
 - ARTESUNATE
 - QUININE
 - MEFLOROQUINE [> 12wks]

RHEUMATOID ARTHRITIS

→ Better Prognosis

SARCROID

→ Better Prognosis

ULCERATIVE COLITIS

→ UNCHANGED

→ WORSE PROGNOSIS → IF 1st time Presentatⁿ in Pregnancy

APPENDICITIS

→ Poor Prognosis

→ ↑ed abortⁿ, Sepsis, Preterm labour & IUD

→ Early Surgery advised

TUBERCULOSIS

→ Worse Prognosis

→ WORST IN PUERPERIUM

- ↑ed demand
- ↓ed supply
- Ongoing Immuno Suppression
- Low Socio Economic status
- Over crowding, Poor ventilatⁿ
- Heat, Humidity

INFECTIONS IN PREGNANCY

VERTICAL TRANSMISSION

- refers to passage from mother to fetus of an infectious agent through
 - ↳ the placenta
 - ↳ during labour or delivery or
 - ↳ breast feeding
- RISK FACTORS
 - ↳ Preterm rupture of membranes
 - ↳ Prolonged labour
 - ↳ obstetrical manipulations

HORIZONTAL TRANSMISSION

- Spread of an infectious agent from one individual to other

SECONDARY ATTACK RATE

- Probability that infection develops in a susceptible individual following contact [an infectious person

VIRAL INFECTIONS

CYTOMEGALO VIRUS

- DNA Herpes virus
- MC perinatal infection in the developed world
- upto 85% of poor & 50% of higher classes are seropositive by the time of pregnancy
- women who develop primary CMV infection during pregnancy [were seronegative before pregnancy], are at greatest risk to have an infected fetus

MATERNAL INFECTION FEATURES

10-15% of infected adults have

- Mononucleosis-like syndrome
- Fever, pharyngitis
- Lymphadenopathy
- polyarthrititis

Features of Immuno compromised

- myocarditis, pneumonitis
- hepatitis, retinitis,
- gastroenteritis or
- meningoencephalitis

TRANSMISSION RATES

- 30-36% in 1st Trimester
- 30-40% in 2nd Trimester
- 40-72% in 3rd Trimester

FETAL INFECTION [only 5-10% neonates demonstrate this syndrome]

FEATURES

- Growth restriction, microcephaly
- Intra cranial calcifications
- chorioretinitis
- mental retardation, sensorineural deficits
- Hepatosplenomegaly
- jaundice, hemolytic anemia
- Thrombocytopenic purpura

COMPLICATIONS

- hearing loss
- Neurological deficits
- chorioretinitis
- psychomotor retardation
- Learning disabilities

DIAGNOSIS

Nucleic Acid Amplification Testing [NAAT] of Amniotic fluid

- Gold standard for Dx of fetal infection

MANAGEMENT

- Despite the high infection rate in primary infection in the 1st half of pregnancy, most fetuses develop normally
- if recent infection is confirmed → offer Am. Fluid CMV
Pregnancy termination may be an option for some
 - Oral valacyclovir 8g daily tried
 - NO vaccine

VARICELLA ZOSTER INFECTIONS

- 90% of adults have serological evidence of immunity
- Primary infection → varicella or chickenpox
- transmitted by direct contact with an infected individual
- Incubation period → 10 to 21 days
- 1 to 2 day flu like prodrome followed by pruritic vesicular lesion that crust after 3 to 7 days
- Period of communicability → 1 day before rash, until lesions crusted

MATERNAL MORTALITY

- predominantly d/t VZV [pneumonia] in pregnancy
 - ↳ Risk factors → smoking, > 100 cutaneous lesions
- Reactivation of 1^o varicella years later causes →
HERPES ZOSTER OR SHINGLES
 - ↳ U/L dermatomal vesicular eruption
 - ↳ alw severe pain
 - ↳ not more frequent or severe in pregnant women
 - ↳ congenital varicella syndrome rarely develops in maternal Herpes zoster

FETAL & NEONATAL INFECTION

CONGENITAL VARICELLA SYNDROME

- The highest risk is b/w 13 - 20 weeks
- chorioretinitis
- Microphthalmia
- cerebral cortical atrophy
- Growth restriction
- After 20 weeks of gestation, no evidence of congenital infection
- Hydronephrosis
- Limb hypoplasia
- Cicatricial skin lesions

AROUND DELIVERY

- active infection just before or during delivery [before maternal antibody formed] is a serious threat

Neonatal mortality rate is 30%.

Disseminated visceral & CNS disease is commonly fatal

Varicella zoster immunoglobulin [VZIG] should be administered to neonates born to mothers who have clinical evidence of varicella - 5 days before & upto 2 days after delivery

DIAGNOSIS OF VARICELLA

MATERNAL

- clinical diagnosis
- confirmed by NAAT of vesicular fluid
- Scraping the vesicle base
 - a Tzanck smear, tissue culture, or direct fluorescent antibody testing

FETAL → congenital varicella Dx \bar{c} NAAT of amniotic fluid

MANAGEMENT

MATERNAL EXPOSURE

- Exposed pregnant women & seronegative → VZIG given
- Best given \bar{c} in 96 hrs of exposure
- can given upto 10 days

ESTABLISHED MATERNAL INFECTION

- IV ACYCLOVIR therapy \bar{c} hospitalizatⁿ at 10-15 mg/kg every 8 hrs

INFLUENZA

- Pregnant women more susceptible to serious complications especially dit pulmonary involvement
- Orthomyxoviridae → RNA virus → both causes epidemics
- Influenza A not related \bar{c} congenital malformations
- viremia is infrequent
- Transplacental passage is rare
- Abortion, pre term labour, still birth all reported, but more dit severity of maternal infection
- NASOPHARYNGEAL SWABS
 - Reverse transcriptase PCR → most sensitive & specific test
 - Rapid Influenza Diagnostic test [RIDT] → Least sensitive & least indicative
- TREATMENT
 - NEURAMINIDASE INHIBITORS
 - Oral OSELTAMIVIR for prophylaxis
 - ZANAMIVIR Inhalation for treatment

MEASLES & MUMPS → NOT teratogenic

RUBELLA / GERMAN MEASLES

- RNA Togavirus

MATERNAL INFECTION

- mild febrile illness
- Generalized maculo-papular rash on face & trunk
- 25-50% are asymptomatic

DIAGNOSIS

- ELISA
- Ig M Antibody detected after 4-5 days onset
 - Ig G peaks 1-2 weeks after rash
 - High avidity Ig G antibodies indicates infection was atleast 2 months prior

- Most complete teratogen
- Worse during Organogenesis
- Rash in

1st trimester	MTCT	→	90%
2nd trimester	MTCT	→	50%
End of 2nd trimester	MTCT	→	25%

CONGENITAL RUBELLA SYNDROME

- cardiac septal defects
- Pulmonary stenosis
- microcephaly
- cataracts
- microphthalmia
- Hepatosplenomegaly
- sensorineural deafness
- Intellectual disability
- Neonatal purpura
- Radiolucent bone disease

- Neonates [congenital rubella may shed the virus for many months [Threat to others]
- DELAYED MORBIDITIES A/W CRS
 - Progressive PanEncephalitis
 - IDDM
 - Thyroid disorders

- PREVENTION
 - Droplet precaution for 7 days after rash
 - can try passive immunization within 5 days of exposure
 - MMR to all non pregnant women
 - avoid 1 month before or during pregnancy [Live attenuated virus]

VACCINES IN PREGNANCY

CONTRAINDICATED

Measles
Mumps
Rubella
varicella
BCG

SAFE

Tetanus & Diphtheria toxoids [Tds]
Hepatitis B
Influenza
Meningococcal
Rabies

Anthrax, Hepatitis A, JE, Polio IPV, Yellow fever → given on special recommendatⁿ

ZIKA VIRUS

- 1st Mosquito borne teratogen
- day time Aedes mosquito bites
- Flaviviridae
- may have sexual transmission

MATERNAL INFECTION

- Rash, fever, Headache, Arthralgia, conjunctivitis
- neurological complications
 - ↳ Guillian - Barre Syndrome, neuropathy & myelitis

FETAL INFECTION [can be severely infected]

- Birth defects [5-15%]
- Neonatal Deaths [5-7%]

CONGENITAL ZIKA SYNDROME

- microcephaly
- Lissencephaly
- ventriculomegaly
- Intra cranial calcifications
- Ocular abnormalities
- congenital contractures

DIAGNOSIS IN PREGNANT WOMEN

ZIKA virus in blood & urine

- Serological testing & confirm by PCR

no specific treatment or vaccine so far

PROTOZOAL**TOXOPLASMOSIS**

- Feline stage in cats
- Non feline stage in Humans
- infection is i cat feces or infected meat ingestion

MTCT OF TOXOPLASMOSIS

- rises i increasing gestational age

1st trimester	→ 15%
2nd trimester	→ 44%
3rd trimester	→ 70%

CLINICALLY AFFECTED FETUSES HAVE

- Low birth weight
- Hepatosplenomegaly, jaundice, anemia
- Neurological diseases i intracranial calcification, hydrocephalus, microcephaly
- CLASSIC TRIAD
 - Chorioretinitis
 - Intracranial calcifications
 - hydrocephalus

Often accompanied by convulsions

DIAGNOSIS

- Ig G before pregnancy → NO risk
- Ig M → appear by 10 days of infection
- Best results are obtained in the Toxoplasma Serologic Profile
- Toxoplasma Ig G avidity increases over time
- If high-avidity Ig G result is found, infection in the preceding 3-5 months is excluded

TREATMENT

Reduction in rates of serious neurological sequelae & neonatal demise

SPIRAMYCIN alone [does not cross placenta]

PYRIMETHAMINE - SULFONAMIDE + FOLINIC ACID [if fetal infection suspected]

PREVENTION

1. cooking meat to safe temperatures
2. Peeling or thoroughly washing Fruits & vegetables
3. cleaning all food preparation surfaces
4. Wearing gloves when changing cat litter
5. Avoiding feeding cats raw or undercooked meat & keeping cats indoors.

MALARIA IN PREGNANCY

- Pregnant women have increased susceptibility
- 'VAR2CSA antigen' leads to Ab formation, which causes accumulation of infected erythrocytes in the placenta, leads to pregnancy specific antimalarial immunity
- Higher rates of maternal morbidity & mortality

FETAL INFECTION

- Abortions
- still birth
- Pre term birth
- Low birth weight
- congenital malaria [< 5% incidence]

DIAGNOSIS

- Thin & Thick films [Best method]
- Malaria - specific antigens for rapid diagnostic testing
 - sensitivity in pregnancy is still an issue

TREATMENT

1. uncomplicated malaria by P vivax, malariae, ovale, chloroquine sensitive falciparum
 - chloroquine or Hydroxychloroquine
2. complicated P falciparum malaria → Artemisinin based regimens
3. chloroquine resistant P. vivax → Mefloquine

HIV IN PREGNANCY

- mostly by HIV-1
- TRANSMITTED BY
 1. Sexual intercourse
 2. Blood
 3. During labour & delivery
 4. Breastmilk
- Primary determinant of transmission → Plasma HIV-1 viral load
- CD₄ site serves as a receptor for virus
Once infected, CD₄ lymphocytes may die
- Illness i AIDS is dlt profound immunodeficiency that gives rise to various Opportunistic infections & neoplasms

According to CDC, 'AIDS' is

- CD₄ T cell count < 200 cells / μl
- CD₄ T cell count comprising < 14% of all lymphocytes or
- One of several AIDS - defining illness

SCREENING

- HIV screening using an OPT-OUT APPROACH
- Repeat testing during 3rd trimester
- is considered for all pregnant women
- Antigen / Antibody combination Immunoassay
 - detects antibodies against HIV-1 & HIV-2 & detects HIV-1 p24 Ag
- HIV-1 NAAT for confirmation

VERTICAL TRANSMISSION [MTCT Rate → 25-40% overall]

- 1% i < 400 copies / ml
- NO cases of vertical transmission i maternal viral loads < 50 copies/ml at delivery

TIMING & TRANSMISSION

- 20% of vertical transmission occurs before 36 weeks
- 50% in the days before delivery
- 30% intrapartum
- Breast feeding MTCT may be as high as 30-40%

CAUTION

- Didanosine, Stavudine & full dose Ritonavir, are exceptions dlt pregnancy toxicity [not teratogenicity]
- Antiretroviral naive - are given ART regardless of trimester
- In general, the starting regimen comprises
 - 2 Nucleoside reverse transcriptase inhibitors PLUS
 - either a Ritonavir boosted protease inhibitor or
 - an Integrase inhibitor

RECOMMENDATIONS

- Taking ART & Pregnant
- Continue current drugs
- all women get ART ASAP
- Monitor CD₄ count at initial & then 3 monthly visits

- **ART NAIVE**
 - ↳ 2 NRTI
 - Abacavir / Lamivudine
 - Tenofovir Disoproxil fumarate | Emtricitabine

 - ↳ And a PI
 - Atazanavir / Ritonavir

 - ↳ or an Integrase inhibitor
 - Raltegravir

INTRAPARTUM CARE

- HIV RNA > 1000 copies / ml → C section at 38 weeks
- HIV < 1000 copies / ml → vaginal delivery can be done

- For HIV > 1000 copies / ml reduce MTCT
- 2 mg / Kg ZDV IV load then 1 mg / Kg hourly till delivery
- For C section, start the IV 3 hours prior

ANTIRETROVIRAL THERAPY

- Ideal strategy to suppress viral load & minimize vertical transmission includes
 1. Preconceptional ART
 2. Antepartum ART
 3. Intrapartum continuation of antepartum oral ART regimen PLUS IV zidovudine
 4. New born ART Prophylaxis

PPH in HIV Women

- best managed with oxytocin & Prostaglandin analogues
- Methylergonovine [methergine] & other ergot alkaloids adversely interact with reverse transcriptase & Protease inhibitors to cause severe vasoconstriction

FDA CATEGORY - 5 CATEGORIES

CATEGORY A

- Safe in pregnancy
- THYROXINE
- MULTI VITAMINS
- FOLIC ACID

CATEGORY B

- have adverse effects in animals
- all studies in human are safe
- PENICILLIN
- CEPHALOSPORINS
- DIDANOSINE
- METRONIDAZOLE
- NITROFURANTOIN

CATEGORY C

- Teratogenic in animals
- inadequate human studies
- most commonly used drugs in Obstetrics
- Mebendazole
- Albendazole
- Acyclovir
- Chloroquine

CATEGORY D

- Known human teratogens
- Benefit > Risk
- ANTI EPILEPTICS [PHENYTOIN, CARBAMAZEPINE]
- QUININE
- LAMOTRIGINE [category C Epileptic drug ; DOC for epilepsy in pregnancy]

CATEGORY X

- Known teratogens
- totally contraindicated [Risk > Benefits]
- ALCOHOLS
- ANDROGENS
- VITAMIN A
- LITHIUM
- RADIO IODINE
- CHEMO THERAPEUTIC DRUGS
- TETRACYCLINS

ALCOHOL IN PREGNANCY

FETAL ALCOHOL SYNDROME

1. DYSMORPHIC FACIAL FEATURES [all 3 required]
 - small palpebral fissures
 - Thin vermillion border
 - Smooth philtrum

2. PRENATAL and / OR POSTNATAL GROWTH IMPAIRMENT

3. CNS ABNORMALITY [1 required]

- Structural ; Head size < 10th percentile , significant brain abnormality on imaging
- Global cognitive or intellectual deficits

ALCOHOL RELATED BIRTH DEFECTS

1. CARDIAC → ASD or VSD
2. SKELETAL → Radio ulnar synostosis joint contractures
3. RENAL → Aplastic or hypoplastic Kidneys
4. EYES → Strabismus , ptosis , Optic nerve hypoplasia
5. EARS → conductive or Neurosensory hearing loss
6. MINOR → hypoplastic nails , clinodactyly , pectus carinatum or excavatum , camptodactyly , HONEY STICK PALMAR CREASE , RAIL ROAD TRACK EARS

WARFARIN EMBRYOPATHY

WARFARIN

- Low molecular weight → readily cross placenta
- causes Embryotoxic & Fetotoxic effect
- 6-9 Weeks AOG Exposure → WARFARIN EMBRYOPATHY
- FEATURES
 1. stippling of vertebrae & femoral epiphysis
 2. Nasal hypoplasia
 3. Depression of nasal bridge

LEFLUNOMIDE

- A Pyrimidine synthesis inhibitor
- used for Rx of Rheumatoid arthritis
- CI in pregnancy , a/w
 - ↳ hydrocephalus
 - ↳ Eye abnormalities
 - ↳ skeletal abnormalities
 - ↳ Embryo death
- detectable in plasma for upto 2 years
- CHOLESTYRAMINE TREATMENT / WASHOUT
 - ↳ performed for early excretion of drug
 - ↳ Fib verification of serum levels [should be undetectable on 2 tests performed 14 days apart]

FETAL HYDANTOIN SYNDROME

- dit intake of ANTI EPILEPTICS like Phenytoin , Carbamazepine
- FACIAL FEATURES include
 1. upturned nose
 2. mild mid facial hypoplasia
 3. Long upper lip i thin vermilion border
 4. Distal digital hypoplasia
- at least 3 months washout period required before planning of pregnancy

MC cause of Anemia in pregnancy in India → NUTRITIONAL ANEMIA

CAUSES OF ANEMIA

1 ↓ Production

- a Iron Deficiency Anemia
- b Megaloblastic Anemia
- c Folic Acid deficiency Anemia

2 ↑ LYSIS

- a Hemolytic Anemia
- b Chronic Blood loss

DEFINITIONS

- WHO → Hb → < 11 gm%.
- CDC → Hb → < 11 gm%. or
Hb → < 10.5 gm% in 3rd trimester
- Mild → Hb → > 10 & < 11 gm%.
- Moderate → Hb → 7 - 10 gm%.
- Severe → Hb → < 4 gm%.

IRON DEFICIENCY ANEMIA

IRON REQUIREMENT IN PREGNANCY

- 1000mg elemental Iron [per day = 4-6 mg/day × 280 = 1120 mg]
- 500mg → for Hb expansion
- 300mg → for fetus & Placenta
- 200mg → wasted

MANAGEMENT

- 100 mg/day elemental Iron Tab in (N) pregnancy
- 200 mg/day elemental Iron in mild to moderate anemia
- oral Iron Supplementalⁿ forms
 - Fe Sulphate
 - Fe ascorbate
 - carbonyl Iron
 } Better absorbable forms

Deworm the patient with MEBENDAZOLE (100mg Tab BD × 3 Days)

→ Injectable Preparations

- only indicated → Intolerance or Malabsorptⁿ
- STOP ORAL IRON at the time of giving injectables
- Injectable forms → Fe dextran [im/iv], Fe Sorbital [im]
Fe sucrose [iv] - NO anaphylaxis [No testing done]

→ Rate of Rise of oral & injectable preparation is same [1gm% over 2 1/2-3wks] ⁴³

REQUIREMENT → $2.21 \times \text{wt in kg} \times (\text{Targeted Hb} - \text{Pt Hb}) + 1000 \text{ mg}$ (stores) ^{FOR}
→ $\cong 200 \text{ mg} / \text{Hb deficiency}$

→ Requirement of Blood for Rx of Anemia

- Hb → $< 7 \text{ gm\%}$ or
Severely anemic in Late in pregnancy

- whole blood ↑ Hb by $0.8 - 0.9 \text{ gm\%}$
Packed cells ↑ Hb by $0.8 - 0.9 \text{ gm\%}$, [lesser volume load] [So Better]

→ IDA INDICES

① SERUM FERRETIN

- 1st parameter to change
- (N) - $40 - 160 \text{ ng/ml}$
- IDA - $< 20 \text{ ng/ml}$

- ② Hb → ↓
- ③ MCV → ↓
- ④ MCH → ↓
- ⑤ Serum Iron → $< 50 \text{ µg/dl}$
- ⑥ Total Iron Binding capacity → $> 400 \text{ ng/dl}$
- ⑦ Red cell Distributⁿ width [RDW] → ↑

→ THALASSEMIA INDICES

- ① RDW → Normal
- ② MCH → $< 27 \text{ Pg}$ [(N) - 29 ng]
- ③ Hb → Normal
- ④ MCV/RBC → < 13 [MENTZER INDEX]

MEGALOBLASTIC ANEMIA

CAUSES

1. FA Deficiency

- ↑ demand
- ↓ supply
- Malabsorptⁿ
- Intestinal Sx or resectⁿ

2. Vit B₁₂ Deficiency

- ↓ Absorptⁿ
- ↓ Intrinsic factor
- Achlorhydria

- slow onset
- Hb↓
- MCV → > 100 fl
- Requirement → 0.4 to 0.5 mg/day
- Supplementatⁿ → 5 mg/day in megaloblastic anemia
- Inj. Cyanocobalamin can be given

NUTRITIONAL ANEMIA

→ IDA + Megaloblastic Anemia

DIMORPHIC ANEMIA

→ microcytic hypochromic + megaloblast

- aka MORNING SICKNESS
- can happen anytime

REASON OF EXCESSIVE VOMITING

- ↑ HCG
- ↑ Estrogen
- ↑ Progesterone
- ↑ Leptins
- ↑ Ghrelin
- Placental growth hormone

HYPEREMESIS GRAVIDARUM

- Severe vomiting
- Unrelenting nausea
- almost no intake of food & fluids
- Environmental & psychological factors also associated

SYMPTOMS

- dehydration
- weight loss
- ↓ HCl [Alkalosis]
- hypokalemia
- starvation ketosis
- mild liver dysfunction [in severe cases]

DISORDERS TO BE RULED OUT

- | | |
|--------------------|-------------------------|
| 1. GASTROENTERITIS | 4. ACUTE CHOLECYSTITIS |
| 2. HEPATITIS | 5. HYDRONEPHROSIS |
| 3. PANCREATITIS | 6. PEPTIC ULCER DISEASE |

LATE PREGNANCY VOMITING TO BE RULED OUT

1. PRE ECLAMPTIC TOXEMIA
2. FATTY LIVER

PROBLEMS IN MOTHER DUE TO EXCESSIVE VOMITING

1. Esophageal tear - BOERHAAVE SYNDROME
2. MALLORY WEISS TEARS
3. DIAPHRAGMATIC TEARS
4. ACUTE KIDNEY INJURY
5. DEPRESSION
6. VITAMIN K DEFICIENCY [Hypoprothrombinemia]
7. VITAMIN B1 [thiamine] DEFICIENCY [WERNICKE ENCEPHALOPATHY]

OBSTETRIC OUTCOME

- Preterm labour
- Abruption
- Pre eclamptic toxemia

TREATMENT

1. MILD VOMITING

A. DIET MODIFICATION

- Frequent small foods
- Dry biscuits in the morning i empty stomach
- Stop short of satiety

B. MEDICATION → doxylamine + B6 [Tab]

2. MODERATE VOMITING

A. MEDICATION

- Prochlorperazine
 - Promethazine
 - metoclopramide
- } oral
- ondansetron → Rectal / oral

3. SEVERE VOMITING

A. IV HYDRATION [normal saline, Ringer lactate, ??? dextrose (Serum/urine ketones to be monitored)]

- B. IV Promethazine
 IV Prochlorperazine
 IV Ondansetron
 IV Metoclopramide

C. ADD 100 mg Thiamine

4. INTRACTABLE VOMITING

- A. Parenteral Nutrition
 B. Enteral nutrition

FROM THE ONSET OF PREGNANCY UNTIL 16 WEEKS THE VOMITING CONTINUES ,
 AFTER THAT IT WILL SUBSIDE

LOCATION

- ① FALLOPIAN TUBE [mc]
 - Ampulla [mc site - 70%]
 - Isthmus
 - Fimbrial area
- ② OVARY
- ③ ABDOMEN

PRIMARY OVARIAN ECTOPIC

- SPIEGELBERG'S CRITERIA
- No evidence of attachment
- Ovarian tissues seen in the periphery of Ectopic
- Tube should be intact

PRIMARY ABDOMINAL ECTOPIC

- STUDDIFORD CRITERIA
- No evidence of attachment to the tube or uterus
- Primary abdominal nidation is present

TERM ABDOMINAL PREGNANCY IS VERY RARE → Delivered by LAPAROTOMY

- ④ CESAREAN SCAR ECTOPIC
- ⑤ CERVICAL ECTOPIC

TIME OF RUPTURE

- Isthmic Ectopic → 4-6 wks
- Ampullary Ectopic → 6-8 wks
- Interstitial / Cornual Ectopic → 12-16 wks

CAUSES

- ① PELVIC INFLAMMATORY DISEASES → Salpingitis Isthmica Nodosa
 - mc cause
 - microdiverticulae are present
- ② TUBAL SURGERIES
 - Recanalizatⁿ
 - Previous Tuboplasty
 - fimbriostomy
- ③ ABDOMINAL / PELVIC SURGERIES
- ④ ENDOMETRIOSIS
- ⑤ TUBERCULOSIS

- ⑥ PREVIOUS ECTOPIC
 - 15% chance, if previous pregnancy is ectopic
- ⑦ INFERTILITY TREATMENT
- ⑧ USE OF IUCD
- ⑨ USE OF POP

IF a Normal woman conceives

- 98-99% are uterine pregnancies
- 1-2% are Ectopic pregnancies

IF a woman under contraceptⁿ [IUCD/POP] conceives

- Actual possibility of conception ↓ses → No. of Pregnancies ↓↓
- No. of Ectopic pregnancies ↓↓
- BUT in those pregnancies → 95% are uterine pregnancies
- 5% are ectopic pregnancies

MANAGEMENT OF PREGNANCY \bar{c} IUCD INSITU

- Remove the IUCD
 - IF can't locate
 - USG, XRay Pelvis, hysteroscopy can be done
 - Laparoscopy may be required
- IF Women,
 - Wants the child → continue the pregnancy [Risk of abortⁿ is 25%.]
 - Donot want baby → MTP

PRESENTATION

SYMPTOMS

- Pain abdomen [mc]
- Amenorrhea
- Bleeding d/t shedding of decidua
 - FATE OF ECTOPIC [Fallopian Tube]
 - vascular Insufficiency [mc]
 - Tubal abortion
 - Rupture of Tube [Rare]

VASCULAR Insufficiency	→	Death of fetus	→	⊗ HCG product ⁿ
Bleeding from vagina	←	Shedding of Decidua	←	⊗ Progesteron by corpus luteum

- Syncopal attacks

SIGNS

- Shock
- Lower abdominal tenderness
- CULLEN SIGN → Bruising around the umbilicus } d/t Intra-peritoneal collectⁿ of blood
- TURNER SIGN → Bruising at flanks }
- On P/V Examinatⁿ → Cervical motion tenderness
- Bogginess / fullness in Pouch of Douglas
 - can aspirate POD → Non clotting blood
 - d/t Peritoneal fibrinolysis

MANAGEMENT

RUPTURED ECTOPIC

① Resuscitation

- 2 IV line of 14 Gauge
- Colloids, IVF
- Arrange for Blood [Think of O -ve]
- Plan the surgery

② SURGICAL MANAGEMENT

- can be done by Laparotomy
- Laparoscopy [Not done in shock]
- TOTAL SALPINGECTOMY

UNRUPTURED ECTOPIC → SAVE THE TUBE

① MEDICAL MANAGEMENT

- METHOTREXATE [Local/systemic]
- ACTINOMYCIN
- KCL
- MIFEPRISTONE

② SURGICAL MANAGEMENT

- LINEAR SALPINGOSTOMY [SxOC] [kept open]
- LINEAR SALPINGOTOMY
- RESECTⁿ ANASTOMOSIS
- MILKING OF TUBE [↑ses Risk of Ectopic Pregnancy - OUTDATED]

CRITERIA FOR Sx CONSERVATIVE MANAGEMENT

- Size of Ectopic → > 3.5 cm [4 cm]
- HCG → > 5000 IU
- Cardiac Activity → Present

DIAGNOSIS OF PREGNANCY

- CASE 1**
- LMP 16th August & Missed period & On 16th September Dx OF Pregnancy
 - Urine Pregnancy Test → ⊕ in 60-70%.
 - β HCG → ⊕ in > 95%.
 - Radio Immune Assay → ⊕ in 100%.

- CASE 2**
- LMP - 16th August & Missed Period. Period of gestatⁿ on 16th September?

→ **PERIOD OF GESTATⁿ IS CALCULATED FROM 1ST DAY OF LMP**

- 4 weeks & 3 days OF POG
- Dx OF Pregnancy on 4 wks 3 days POG by
-

	Gestational Sac	Cardiac Activity
TVS [Transvaginal sonography] [Preferred]	→ 4 + weeks	→ 5 + weeks
TAS [Transabdominal sonography]	→ 5 + weeks	→ 6 + weeks

- MRI → Trouble solver
- Laparoscopy [Best]
- HCG
 - Doubling in 48 Hrs → Intrauterine Pregnancy
 - Doubling in 5-7 Days → Ectopic Pregnancy
 - **DISCRIMINATORY ZONE**
 - HCG level beyond which we must see a sac
 - TVS → > 1500 IU
 - TAS → > 6500 IU

- Serum Progesteron
 - > 25 ng/ml → Intra uterine Pregnancy
 - < 5 ng/ml → Ectopic Pregnancy or Missed abortⁿ

ABORTIONS

- Age of Abortus in
- India → < 28 wks
 - UK → < 24 wks
 - USA → < 20 wks
- MTP can be done upto
- India → ≤ 20 wks
 - UK → till 24 wks
 - USA → till 20 wks

SPONTANEOUS ABORTIONS

- 50% of all human pregnancies

TYPES

- Embryonic [50%]
 → Anembryonic [Blighted ovum] [50%]

EMBRYONIC ABORTIONS

causes

- ① CHROMOSOMAL → usually present during 1st Trimester
- Trisomies 16/18/21
 - monosomies 45 X0

mc of Embryonic abortions	→ Chromosomal
mc chromosomal cause of abort ⁿ	→ Trisomies
- mc cause of abort ⁿ in Trisomies	→ Trisomy 16
mc chromosomal defect in Pregnancies	→ Monosomy 45X0

- ② ANATOMICAL → usually present during 2nd Trimester
- Septate uterus
 - Bicornuate uterus
 - Incompetent OS [short cervix]
- ③ MATERNAL → usually present during any of the trimester
- Syphilis
 - SLE
 - APLA Syndrome
 - DM
 - TORCH
 - TB
 - Cancers
 - Celiac Disease
 - hypothyroidism

RECURRENT PREGNANCY LOSS

→ Loss of ≥ 2 Pregnancy Loss

CAUSES

- chromosomal [mc]
- Anatomical
- Maternal [TORCH infectⁿ does not cause Recurrent Pregnancy Loss]

ANATOMICAL CAUSES

① SEPTATE UTERUS

- mc Mullerian defect
- causes 2nd Trimester abortⁿ
- Mx → Hysteroscopic Resectⁿ

② BICORNUATE UTERUS

- STRASSMAN'S METROPLASTY
 - unificatⁿ Sx
 - only indicated in Recurrent Pregnancy Loss

③ INCOMPETENT OS [SHORT CERVIX [$< 2.5\text{cm}$]]

- Mx by Encerclage → applied > 12 wks, removed ≥ 37 wks
- Mc → Mc Donald's cerclage

THROMBOPHILIAS

① INHERITED

- Factor V Leiden mutation
- Methyl Tetra Hydro folate reductase Gene mutatⁿ
- Prothrombin Gene mutatⁿ
- Protein C, S deficiency
- Antithrombin III deficiency

② ACQUIRED

ANTI PHOSPHOLIPID ANTIBODY SYNDROME

- APL Antibodies
 - Lupus Anticoagulants
 - Anti cardiolipin Antibodies
 - Anti β_2 Glycoprotein Antibodies
- Hyper Homocystenemia
- Criteria
 - Clinical
 - ≥ 1 venous / Arterial Thrombosis
 - ≥ 1 morphologically normal baby lost after 10 wks
 - ≥ 1 morphologically \textcircled{N} baby lost before 34 wks completed
 - ≥ 3 Abortions before 10 wks
 - Lab
 - Anticardiolipin Antibodies $\left\{ \begin{array}{l} \text{IgG} \\ \text{IgM} \end{array} \right. \textcircled{+}$
 - Lupus Anti coagulant $\textcircled{+}$

- Management
 - LMW Heparin
 - Anti Platelet Drugs

TORCH INFECTIONS

CYTOMEGALOVIRUS

- MC mother to child Transmitted infection → CMV
- IF CMV transmitted before 15 wks → 5-6% babies are affected
 - Features
 - microcephaly
 - Intra ventricular Haemorrhage
 - Mental Retardatⁿ
 - Periventricular calcificatⁿ
- Assessed by → AVIDITY TEST [Best]
 - viral culture of Amniotic Fluid

RUBELLA

- MTCT in 1st trimester → upto 80-85%
- in 2nd trimester → upto 60-65%
- at end of 2nd Trimester → upto 25%
- IF Rubella vaccine is given → pregnancy avoided at least for 1 month

TOXOPLASMA

- MTCT in 1st trimester → upto 10% [↑↑ Anomalies]
- in 3rd trimester → upto 60% [Congenital Toxoplasmosis syn]
- congenital Toxoplasmosis Syndrome
 - Features
 - Intracerebral calcification
 - chorioretinitis
 - Microcephaly
 - Rx - SPIRAMYCIN 1gm, 2-3 times/day ; 3 weeks on, 1 week OFF

CHICKEN POX

- congenital varicella Syndrome
 - max chance of transmission → 13-20 wks
 - Features
 - Microcephaly
 - cerebral calcificatⁿ
 - IUGR
 - Limb hypoplasia
 - cortical atrophy

- IF transmitted around delivery time
 - in 5 days before delivery or } Upto 30% Neonatal mortality
 - in 2 days after delivery
- Rx in varicella zoster Immunoglobulin
- Diagnosed by
 - TZANK SMEAR
 - Direct fluorescent Antibody
 - Nucleic Acid Amplification Test

HIV

- MTCT Rate → 25-30%
 - SF breast feeding ⊕ → 10-15% more chance
 - Breast Feeding contraindicated Except in developing countries [NEVIRAPIN SYRUP recommended]
- Management during Pregnancy
 - ZUDOVUDINE or TENOFOVIR
 - LAMIVUDINE [3TC]
 - NEVIRAPINE or EFFAVIRENZ
- METHOD OF DELIVERY
 - Normal vaginal Delivery
 - Cesarean Sectⁿ only in Obstetric indicatⁿ

HEPATITIS B

- MTCT Rate
 - Antigen ⊕ → 90%
 - Antibody ⊕ → 10%
 - chronic carrier → 40%
- At birth, Active & Passive Immunizatⁿ should be done

PRESENTATION

- Pain abdomen
- Bleeding P/V
- PV Examinatⁿ
 - OS closed, uterine size = POG → THREATENED ABORTION
 - OS open, Products are bulging → INEVITABLE ABORTION
 - OS open, Products are prolapse & H/O Passage → INCOMPLETE
 - OS closed, H/O Passage, Normal uterine size → COMPLETE

→ on USG,
cardiac Activity + at 9 wks
crumbled man
NO pain & NO bleeding } 12 wks → MISSED ABORTION

→ BLIGHTED OVUM / ANEMBRYONIC GESTATION

- Normally around 7 wks of gestatⁿ, Yolk sac is Pinched out
- Pregnancy not gone beyond the stage of sac → BLIGHTED OVUM

MEDICAL TERMINATION OF PREGNANCY [MTP]

→ MTP can be done, < 20 wks in India by

- Gynecologist
- Doctor who trained for 6 months in gynecology
- Doctor who performed at least 25 MTPs under supervision

→ IN 1ST TRIMESTER, done by

MEDICAL ABORTION

- 99% Successful → IF done in 1st 7 wks
- 95% Successful → IF done in 1st 9 wks

DRUGS

MIFEPRISTONE

- Antiprogestin
- Kills the fetus
- can be given orally
- 200 - 600 mg

↓ 24 - 72 hrs later

MISOPROSTOL [PGE1]

- vaginally
- 800 mg
- Expels the fetus

Do USG

↓

IF Intrauterine Pregnancy

↓

Wait for Bleeding to get over

↓

Do a check Sonography

→ to confirm the location

→ Administer DRUGS

→ to check completⁿ

MENSTRUAL REGULATION SYRINGE → can be done upto 45 days

SUCTION EVACUATION → can be done upto 8-10 wks

DILATATION & CURETTAGE → can be done upto 8-12 wks

→ >12 WKS , PROCEDURE OF CHOICE → PROSTAGLANDINS

PROSTAGLANDINS

- MISOPROSTAL [PGE1]
 - Orally, rectally or vaginally
 - DINDROSTONE [PGE2]
 - Gel form
 - vaginally
 - CARBOPROST [PGF_{2α}]
 - IM only
 - INTRA AMNIOTIC PGs
 - EXTRA AMNIOTIC ETHACRIDINE LACTATE
 - EXTRA AMNIOTIC HYPERTONIC SALINE
 - EXTRA AMNIOTIC HYPER OSMOLAR UREA
- } OUTDATED

LAMINARIA TENTS

- Dried sea weeds
- Imbibe fluid & swell up
- Hygroscopic Action

SURGICAL METHOD → Hysterotomy

- In case of failure of above procedures

- Labour starting before 37 weeks
- 37 - 42 wks → TERM
- 40 wks → EDD [Expected Date of Delivery] → 4% of total Deliveries
- > 42 wks → POST TERM
- > 40 - 42 wks → PAST DATES
- > 37 wks → PRE TERM LABOUR
- < 32 wks → SEVERE PTL
- 32 - 34 wks → USUAL PTL
- > 34 - 36 [+60] wk → LATE PRE TERM LABOUR

DIAGNOSIS

- Uterine contractions
 - 4 times in 20 min
 - 8 times in an hour
- On PV Examinationⁿ, if cervix
 - \geq 1cm dilated
 - > 80% effaced
 - > 3cm dilated, > 80% effaced → Advanced Pre Term Labour
 - < 3cm dilated, < 80% effaced → Early Pre term Labour
 - 1 cm dilated, < 80% effaced → Do Cervical Examinationⁿ
 - TVS Cx → > 2.5 cm → False labour
 - TVS Cx → < 2.5 cm → Threatened labour
- INCIDENCE OF PTL → 6-15% [~10%] of ALL Pregnancies

CAUSES

- ① Infections [20-40%] → Pelvic Inflammatory Disease, UTI
- causative organisms
- | | |
|------------|-----------------------|
| Chlamydia | Bacterioides |
| Gonorrhoea | Gardnerella vaginalis |
| Ureaplasma | E. coli |
| Mycoplasma | Streptococcus |

CHORIOAMNIONITIS DIAGNOSIS

- Any 2 of following
- ↑ Total Leucocyte Count
 - ↑ C Reactive Protein → > 2.7 mg/dL
 - uterine tenderness
 - ↑ Pulse Rate
 - Foul smelling discharge

IF SUB CLINICAL [CRP > 1.6] → DO Amniocentesis & culture sensitivity testing

② UTERINE OVER DISTENTION

Polyhydramniotic

Twins

Large Baby

③ UTERINE ANOMALIES

Septate uterus

Bi Cornuate uterus

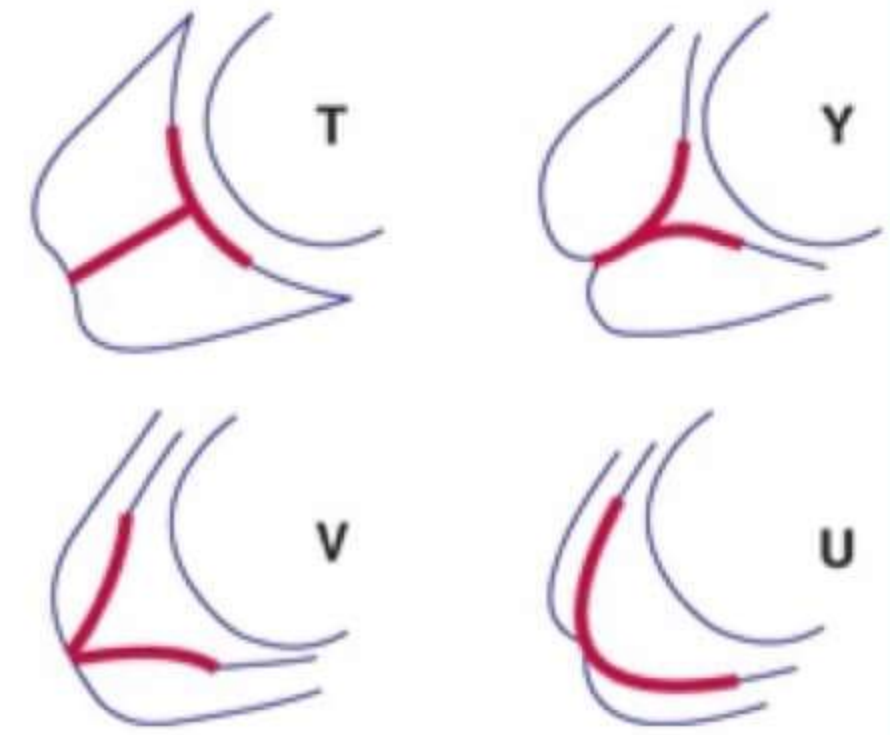
④ BLEEDING IN CHORIO RESIDUAL SPACE

⑤ MATERNO FETAL STRESS

⑥ CERVICAL ABNORMALITIES

Incompetent cervix

Cervical lacerations



FUNNELING OF CERVIX

PREDICTION OF PTL

1 USG

- at 12-13 wks → Short cervix → <2.5cm
- around 29 wks → Funneling of cervix

2 FETAL FIBRONECTIN

- Presence is Normal → <22 wks & >37 wks
- If seen b/w 22-37w → Predictive of PTL
 - 30% PTL in 1 week
 - 41% PTL in 2 weeks

NEW BORN COMPLICATIONS

- Respirative Distress Syndrome [Hyaline Membrane Disease]
- Intra ventricular Haemorrhage
- Bronchopulmonary Displasia
- Necrotizing Enterocolitis
- Neonatal Deaths

MATERNAL COMPLICATIONS

- Endometritis
- Puerperal Sepsis

MANAGEMENT

① FOR LUNG MATURITY

a. STEROIDS

- DEXAMETHASONE 6mg 12 hourly 4 Doses
- BETAMETHASONE 12mg 24 hourly 2 Doses

b. ARTIFICIAL SURFACTANTS

- Post natively & by intra tracheal route route
- SURVATA [Bovine]
- AXOSURF
- ALEC

② TOCOLYSIS

- Tocolytics acts only in Latent Phase
- TIMING → < 3cm & < 34 wks
- PURPOSE → To get time for lung maturity

DRUGS

a. β Agonists

SALBUTAMOL
RITODRINE
ISOXSUPRINE

Side Effects

Glycogenolysis } → ↑ Sugar
Lipolysis }
Pulmonary edema

b. Calcium channel Blockers

NIFEDEPINE

- First line & Safest drug
- Start 30 mg orally & maintain \bar{c} 20 mg

c. Calcium Antagonists

MgSO₄

- Side Effects → Neonatal hypotonia
hypocalcemia
- Benefits → Neuroprotective

ABOVE 3 CLASSES OF DRUGS CAN CAUSE PULMONARY EDEMA. Safest is NIFEDEPINE

d. OXYTOCIN Antagonist

ATOSIBAN

- Neonatal morbidity & Neonatal mortality shows NO BENEFIT \bar{c} it

e. PROSTAGLANDIN SYNTHETASE INHIBITORS

NSAIDS : INDOMETHACIN

25 - 50 mg , once or twice a day

S/E - Premature closure of Ductus Arteriosus

Not give beyond 32 weeks

f. PROGESTERONE

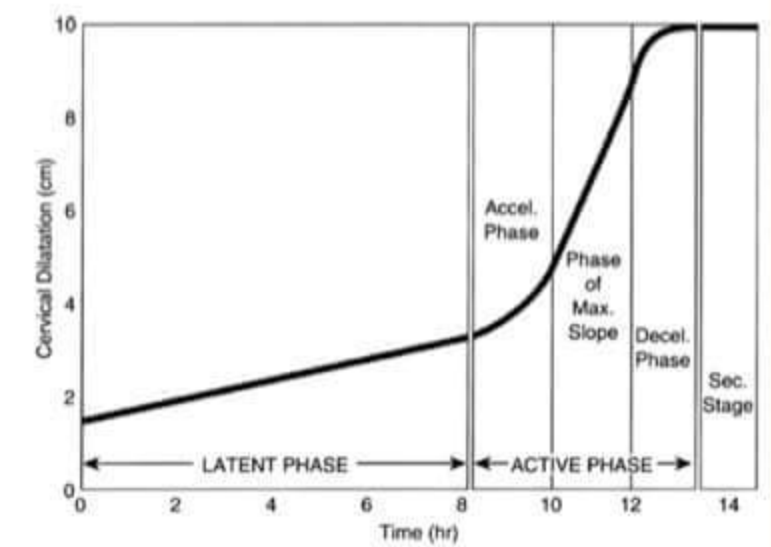
Smooth muscle Relaxants

used for Prophylaxis

Transvaginal route is preferred

g. NO DONORS : NITROGLYCERINE PATCH

0.2 mg/hr to 0.4 mg/hr



LABOUR - PHASES

F. DIZOXIDE

Smooth Muscle Relaxant

SIE → hypotension in Mother

Fetal Distress

→ Prevented by Pre Loading mother \bar{c} 500 - 1000ml Ringer Lactate

LUNG MATURITY ASSESSMENT

→ Lung matured when

- Lecithin Spingomyelin Ratio → > 2:1
- Phosphotidyl glycerol tnt in Amniotic fluid
- Phosphotidyl choline tnt in Amniotic fluid
 - Best part of surfactant
 - ~ 70% of surfactant
 - Starts forming at 24 wks
 - Formed by Type II Alveolar Pneumocytes
 - After Adequate formatⁿ → GLYCEROL starts producing

PHOSPHOTIDYL GLYCEROL IS THE FINAL INDICATOR OF PULMONARY MATURITY
PHOSPHOTIDYL GLYCEROL PRESENT ONLY IN AMNIOTIC FLUID

- choline present in
 - Amniotic fluid
 - Maternal serum
 - Fetal serum

→ SHAKE TEST

→ Bubbles formed

→ TAP TEST

→ Bubbles formed

→ NILE BLUE PHOSPHATE TEST

- sediment of Amniotic Fluid centrifuge is taken → contain skin cells
- skin cells are plated on a slide



Add Nile Blue Agent

Skin cells \bar{c} lipids → ORANGE colour
if >50% are orange → indicates MATURED LUNG

BASIC CONCEPT OF SHAKE TEST, TAP TEST & NILE BLUE PHOSPHATE TEST

Amniotic Fluid is assessed for skin fats

IF skin cells positive for skin fats, it also indicates the Lung fat Production
Both skin fat Production & Lung fat productⁿ are simultaneous Processes.

NILE BLUE TEST → Lung maturity Assessment

NITAZINE PAPER TEST → PROM Assessment

PREMATURE RUPTURE OF MEMBRANES ASSESSMENT

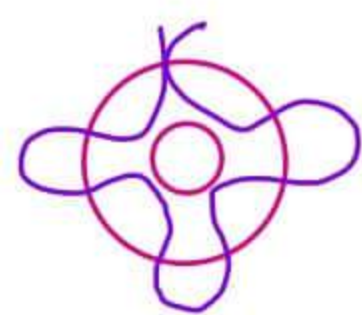
- a. NITRAZINE PAPER TEST - done for PROM [Pre Mature Rupture Of Membranes]
 - PROM - ROM Prior to Onset of Labour
 - If ROM is before 37 wks → PRE TERM PROM
 - Blue - if Amniotic Fluid [Alkaline] in vagina
 - Red - if vaginitis [Acidic]
- b. FETAL FIBRONECTIN
- c. ↑ ALPHA FETO PROTEIN
- d. FERNING OF THE FLUID FROM VAGINA
- e. INDIGOCARMININE DYE TEST

PREVENTION OF PRE TERM LABOUR

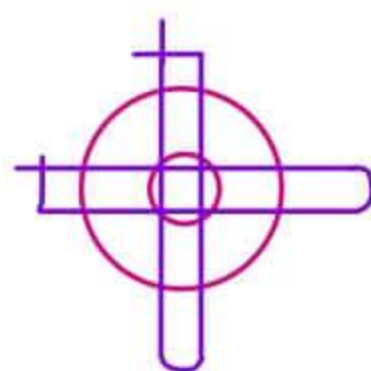
1. Prophylactic Antibiotics
2. Prophylactic Progesterone
3. CERCLAGE
 - Applied when cervix is $< 2.5\text{cm}$
 - Applied $> 12\text{wks}$
 - Removed $> 37\text{wks}$

METHODS

-



MC DONALD'S
CERCLAGE [MC]



WORM'S
STICH

-

SHIRODKAR STICH

- For very short or mutilated stich
- mode of delivery → Cesarean sectⁿ mostly
- can be done transvaginally or transabdominal

UTERUS

- Non Pregnant uterus → 70 grams
- Pregnant uterus at term → 1100 gms
- Uterine Hypertrophy is due to → Estrogens [mainly]
Progesterone
- Uteroplacental Blood Flow → ↑ Progressively in pregnancy
Range → 450ml to 650ml/min near the term
- uterine artery flow/min → 500ml [each]
- elemental Iron required → 1000 mg
 - 500 mg for Hb expansion
 - 300 mg for fetus & placenta
 - 200 mg is wasted

CERVIX

- **ESTRADIOL** stimulate growth of columnar epithelium of the cervical canal so it becomes violet & is called **ECTROPION**
- **CHADWICK SIGN [JACQUEMIER'S SIGN]** is bluish discoloration of vagina & cervix, 6-8 weeks
- **OSLANDER [VAGINAL SIGN]**, pulsatility in the lateral fornices, around 8th week
- **GOODELL SIGN**, softening of the cervix, 6-8 weeks
- **HEGART SIGN**: on a PIV, the abdominal & vaginal fingers seems to oppose below the body of uterus, 6th week
- **HARTMANS SIGN**: Implantation bleeding
- **PALMERS SIGN**: Rhythmic uterine contractions Felt in early pregnancy
- **BRAXTON HICKS** contractions around 16 - 18 weeks

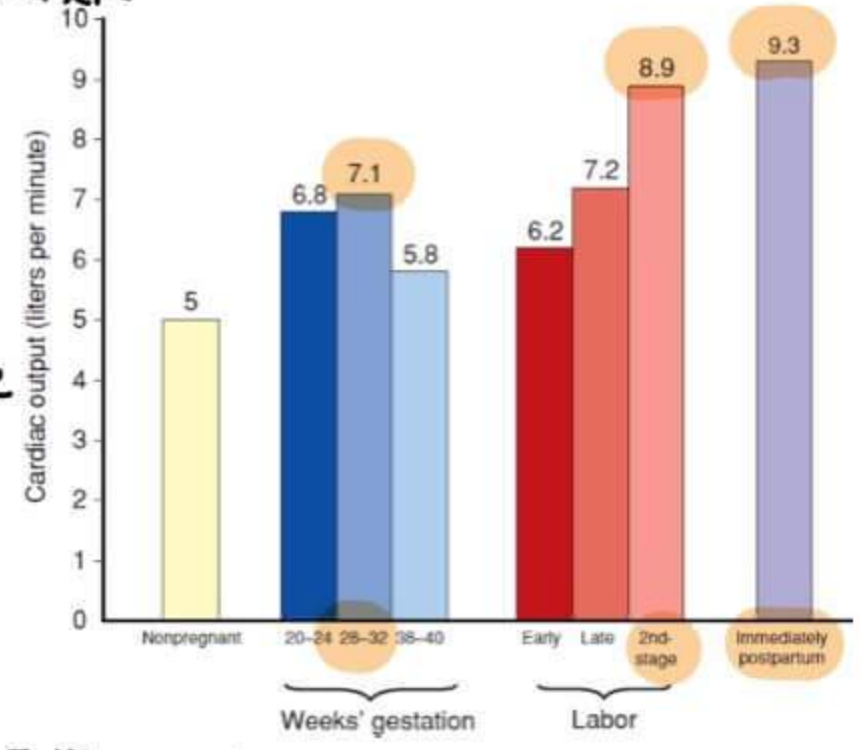
BREAST

- Breast ductal growth → Estrogens
- Breast alveolar cells & Sebaceous glands → Progesterones
- Prolactin leads to → Active secretⁿ of milk after birth
→ Levels ↑↑ in pregnancy
Ⓝ in puerperium
- Breast tenderness & paresthesias ↑ges
- Nipples → larger, more deeply pigmented & more erectile
→ COLD STRUM [yellowish fluid] expressed by gentle massage in few months

- Areola → Become broader
- GLANDS OF MONTGOMERY
 - NO. OF small elevations
 - Hypertrophic sebaceous glands

CARDIO VASCULAR SYSTEM

- Heart → moves upwards
Hypertrophy of cardiac muscle
- Apical impulse → lateralized
- cardiac output → Starts ↑ing by as early as 5th week
Increases by 30% [6 ltr/min]
Reaches to peak at 32nd - 34th week



BLOOD PRESSURE

- Early or mid pregnancy BP → ↓
- Late pregnancy BP → ↑
- Heart Rate → ↑ [10-20%.]
- Stroke volume → ↑ [10%.]
- Mean Arterial Blood pressure → ↓ [10%.]
[DBP + 1/3 Pulse pressure (SBP - DBP)]
- Peripheral Resistance → ↓ [35%.]

Supine hypotensive Syndrome

In approx. 10%, supine compression of great vessels by uterus causes significant arterial hypotension

HEART SOUNDS

- 1st Heart sound → Exaggerated splitting of 1st Heart sound
↑ed loudness of both components
- 3rd Heart sound → Loud & easily heard

MURMURS

- Systolic murmur → >95% develop it, disappears after delivery
- Transient Diastolic murmur → 20% develops it
- continuous murmur → 10% develops it, due ↑ in mammary blood flow

HEMATOLOGY

- Blood volume → ↑ by 30 - 45% at 32nd - 34th wk [Peak]
- Relatively Diluted blood since RBC ↑ is only 20-30%.
- contributing factors
 - ↑ Na retentⁿ
 - ↓ thirst threshold
 - ↓ Plasma oncotic pressure

Red cells	→ ↓
Hb	→ From 130 - 110 g/L
HCT	→ From 38 - 31%
Albumin	→ ↓ 35 g/L

Decrease in

Red cell concentration
Hb concentratⁿ
Haematocrit
Plasma folate concentratⁿ

Increase in

White cell count
ESR
Fibrinogen concentratⁿ

CLOTTING FACTORS IN PREGNANCY

- In pregnancy, there is increased concentrations of all clotting factors except factors XI & XIII
- In Non - Pregnant : Plasma fibrinogen [F-II] is 300 [200 - 400 mg/dl]
- In Pregnancy :
 - ↳ Plasma fibrinogen ↑ 50%
 - ↳ In late pregnancy Avg 450 [300 to 600 mg/dl]

RESPIRATORY SYSTEM

Diaphragm	→ rises about 4 cm
The sub costal	→ 68° - 104°
Respiratory Rate	→ No change
Vital capacity	→ NO change
Tidal volume	→ ↑ [40%]
FRC	→ ↓ [20-30%] [400 - 700 ml]
Inspiratory capacity	→ ↑ [5-10%]
Total lung capacity	→ Unchanged [FRC + Inspiratory capacity]
O ₂ consumpt ⁿ	→ ↑ [20%]

URINARY SYSTEM

Kidney size	→ ↑ by 1.5 cm
GFR	→ ↑ [50%] d/c Hemodilut ⁿ - ↓ protein & ↓ oncotic pressure ↑ renal plasma flow
Glucosuria	→ may not be abnormal
Proteinuria	→ 300 mg/day or more in 24 hr urine
Serum creatinine levels	→ ↓ [0.7 to 0.5 mg/dL]
creatinine clearance	→ ↑ 30%, from 100 to 115 ml/min
Ureter	→ Dilated [Gravid uterus pressure & progesterone]
Bladder	→ frequent micturit ⁿ [↑ pressure & ↑ urethral length]

GASTRO INTESTINAL SYSTEM

- Pyrosis (Heart burn) → ↑
- Gastric emptying time → unchanged
- The motility of large Bowel → diminished → constipation, Hemorrhoids ↑
- Liver function → Alkaline Phosphatase doubled
- SGPT, OT, GGT all reduced
- Sr. Albumin concentration → ↓
- Total Albumin → ↑
- Gall bladder contractility → ↓ : ↑ Residual volume
- Progesterone impairs GB contractility by inhibiting cholecystokinin - mediated smooth muscle stimulation
- Intrahepatic cholestasis & Pruritus gravidarum : Retained Bile salts

ENDOCRINE SYSTEM

- PITUITARY [HYPERTROPHY] → Enlarges by approximately 135 percent
- Sr. PRL : 10 fold of normal, around 150 ng/ml
- Gonadotrophs decline in number
Corticotrophs & Thyrotrophs remain constant
- Somatotrophs are generally suppressed : Placental GH
- THYROID
- TRH levels are normal, transferred across the placenta
Helps fetal pituitary to make TSH]
- TSH reduces in 1st trimester : in 80% women
- TBG increases, zenith at 20th week
- free T₃ T₄ unchanged

PSYCHIATRIC DISORDERS

- Blues → in 1st 2 weeks [50-60%] [dit sudden loss of Progesterone]
- Psychosis → in 1st 2-3 months [<1%]
- Depression → in 1st 3-6 months [10-15%]

DIAGNOSIS OF PREGNANCY

66

Pregnancy tests detect HCG in mother urine or Serum

URINE PREGNANCY TEST

→ 60 - 70% Sensitive

RADIO IMMUNE ASSAY [RIA]

→ 100% Sensitive

Sensitivity to 2 mIU

positive since day 7th of ovulatⁿ

USG

	SAC	CARDIAC ACTIVITY
TVS	4 + WKS	5 + WKS
TAS	5 + WKS	6 + WKS

> 12 WKS FHS heard \bar{c} fetal Doppler

> 24 WKS FHS heard \bar{c} Stethoscope

Palpatⁿ of fetal parts from 24th week

Fetal movement may feel during palpatⁿ

BRAXTON HICK SIGN

→ Irregular painless contractⁿ palpable after 20th week

PUERPERIUM

1 week

→ uterus weighs approx. 500gms

2 weeks

→ about 300gms

4 weeks

→ 100gms

Involutⁿ is complete

LOCHIA

LOCHIA RUBRA

→ first few days of delivery, sufficient blood \oplus → RED

LOCHIA SEROSA

→ After 3 to 4 days, progressively become PALE

LOCHIA ALBA

→ After approx. 10th day

d/t mix of leukocytes

→ WHITE or
YELLOW WHITE

INVOLUTION

At Delivery

→ uterus is at the level of umbilicus [20-22 WKS]

At 2 WKS

→ in pelvis

At 6 WKS

→ Normal organ

Rate of descent

→ 1-2 cm/day

SUB INVOLUTION - CAUSES

→ Infectⁿ

→ Retained Intra uterine products

→ Fibroids

CASE 1 → LMP 16th August & Missed period & on 16th September Dx of Pregnancy

- ① Urine Pregnancy Test → ⊕ in 60-90%. [sensitive to 150 mIU of HCG]
- ② Sr β HCG by ELISA → ⊕ in > 95%. [sensitive to 5 mIU of HCG]
- ③ Radio Immune Assay → ⊕ in 100%. [sensitive to 1-2 mIU of HCG]
→ can Dx pregnancy on 7th day of ovulatⁿ
- ④ ImmunoRadiometric Assay → ⊕ in 100%. [sensitive to 0.5 mIU of HCG]
→ can Dx from 7th to 10th day of ovulatⁿ

CASE 2 → LMP - 16th August & Missed Period. Period of gestatⁿ on 16th September?

→ **PERIOD OF GESTATⁿ IS CALCULATED FROM 1ST DAY OF LMP**

- 4 weeks & 3 days of POG
- Dx of Pregnancy on 4 wks 3 days POG by

⑤ USG

	Gestational Sac	Cardiac Activity
TVS [Transvaginal sonography] [Preferred]	→ 4 + weeks	→ 5 + weeks
TAS [Transabdominal sonography]	→ 5 + weeks	→ 6 + weeks

⑥ MRI → Trouble solver

⑦ Laparoscopy [Best]

⑧ HCG

- Doubling in 48 Hrs → Intrauterine Pregnancy
- Doubling in 5-7 Days → Ectopic Pregnancy
- **DISCRIMINATORY ZONE**
 - HCG level beyond which we must see a sac
 - TVS → > 1500 IU
 - TAS → > 6500 IU

→ **DOUBLE DECIDUAL SAC SIGN ON USG**

- Intrauterine sac [Eccentrically placed]
- outer layer → decidua parietalis
- inner layer → decidua capsularis
- indicates → Intrauterine Pregnancy



SYMPTOMS

- Bloating → ↑ urinary frequency
- Morning sickness → constipatⁿ
 - Nausea
 - vomiting

SIGNS

BREAST CHANGES

- Breast ductal growth → Estrogens
- Breast alveolar cells & Sebaceous glands → Progesterones
- Prolactin leads to → Active secretⁿ of milk after birth
 - Levels ↑↑ in pregnancy
 - Ⓝ in puerperium

Breast tenderness & paresthesias ↑ 8x

- Nipples
 - larger, more deeply pigmented & more erectile
 - COLOSTRUM [yellowish fluid] expressed by gentle massage in few months

- Areola
 - Become broader
 - GLANDS OF MONTGOMERY
 - no. of small elevations
 - Hypertrophic sebaceous glands

In 2nd trimester

- Quickening [22-24 wks in Primi]
- Uterine souffle } around 24 wks
- Funic [umbilical] souffle }
- Internal Ballotment → around 16-18 wks
- External Ballotment → around 22-24 wks

In 3rd Trimester (> 28 wks)

- Fetal Heart sound by fetoscope / Stethoscope
- Fetal parts can be felt
- Fetal movements can be felt

DIAGNOSTIC SIGNS OF A NON VIABLE PREGNANCY BY TVS

- ① Gestational sac → ≥ 25 mm size
- ② crown Rump length → ≥ 7 mm
- ③ No cardiac Activity
- ④ G. Sac Present → ≥ 2 wks later → no embryo, no cardiac activity
- ⑤ G. Sac + Yolk sac int → ≥ 11 days later → no embryo, no cardiac activity
- ⑥ Yolk sac → ≥ 7 mm

USG

1st TRIMESTER [upto 12 weeks]

- can assess formation of normal fetus & presence of gross fetal structure
- only NTDs can be detected are → Anencephaly & Acrania

2nd TRIMESTER

- **TARGETTED SCANING** for specific defects can be done

→ **SOFT MARKERS FOR DOWN SYNDROME**

- ↳ Brachycephaly
- ↳ clinodactyly [short 5th digit]
- ↳ short femur
- ↳ short humerus
- ↳ Echogenic focus in ventricle
- ↳ Nasal bone absence
- ↳ Nuchal fold thickness
- ↳ Flat facies
- ↳ Echogenic bowel
- ↳ Sandal gap

→ **MARKERS FOR SPINA BIFIDA**

- ↳ scalloping of frontal bones → LEMON SIGN
- ↳ Forward curvature of cerebellum → BANANA SIGN

- Nuchal translucency > 3mm → suggestive of DOWN SYNDROME
- > 14 weeks → Nuchal fold > 6 mm → suggestive of Down syndrome

BIOCHEMICAL MARKERS FOR DOWN SYNDROME

UPTO 12 WEEKS

- HCG → ↑
- PAPP-A → ↓

FROM 16th WEEK ONWARDS

TRIPLE MARKER

→

	Median values	Measured values
HCG	x	↑
UE ₃	y	↓
α FP	z	↑

- Expressed in MOM [multiples of median] units
- 60 - 70% sensitive

QUADRUPLE MARKER

- Triple marker + Inhibin ↑
- 80% sensitive

1st Trimester screening [HCG, PAPP-A] + Nuchal translucency → 80% sensitive

INTEGRATED SCREENING [1st + 2nd trimester screening]

- 94-96% sensitive
- Best screening test

CONFIRMATORY TEST

- 1st Trimester → chorionic villus sampling
- 2nd Trimester → Amniocentesis

Cell free fetal DNA assessment / Non - invasive fetal trisomy / non invasive pre natal testing

- After 12 weeks → fetal DNA may be seen in maternal circulation
 - ↳ > 98% sensitive
 - ↳ it is not still diagnostic test

METHOD OF CHORIONIC VILLUS SAMPLING

- done at 1st Trimester [10 - 13 week]

put a needle by Trans abdominal method [transvaginal is mc used]



Take out fetal villi [chorionic frondosum] & discard maternal villi



run the karyotype on the fetal cells & genetic analysis done



Gives early diagnosis, but abortion chance is 2%.

- If doing < 10 weeks can cause
 - ↳ Limb reduction defects
 - ↳ Oro mandibular defect

METHOD OF DOING AMNIOCENTESIS

- done at 16 - 18 weeks

put a needle by transabdominal method



Take out amniotic fluid around 20ml, containing fetal skin cells



on fetal skin cell carry karyotype & genetic analysis

- Abortion rate → < 1%
- But diagnosis gets delayed as compared to chorionic villus sampling

EARLY AMNIOCENTESIS

- done b/w 13 - 15 weeks
- Abortion rate \cong chorionic villus sampling

PERCUTANEOUS UMBILICAL BLOOD SAMPLING [PUBS] / CORDOCENTESIS

- done after 18 weeks
- usually done for
 - the assessment of fetal anemia
 - blood transfusion to the fetus
 - fetal problems
- invasive procedure
 - umbilical vein near insertion into placenta
 - ↓
 - karyotype can be done in blood lymphocytes

- Gives result in 24-48 Hours
- Assessment of MIDDLE CEREBRAL ARTERY VELOCITY is better to assess fetal anemia

α FETO PROTEIN

- glycoprotein
- source → Yolk sac [initially] , Liver & gut [Later]
- ↑ till 13th weeks in fetal circulation & then reduces gradually
- in Maternal circulation α FP ↑ after 12th week
- Earlier ↑ α FP in amniocentesis is very sensitive for NTD [replaced by USG]
- confirmatory test for NTD → Acetylcholinesterase

α FP is higher in

duodenal atresia
 esophageal atresia
 osteogenesis imperfecta
 NTD
 Omphalocele
 Gastroschisis
 Cystic hygroma

α FP is reduced in

Fetal death [IUD]
 Trisomy
 over estimated maternal age
 obesity
 Trophoblastic diseases

PRE IMPLANTATION GENETIC SCREENING

- indicated for high risk cases

PRE IMPLANTATION GENETIC DIAGNOSIS

INDICATIONS

1. Previous genetic defects
2. recurrent abortion

METHODS

1. BLASTOMERE BIOPSY [mc method]
2. TROPHOECTODERM BIOPSY
 - Trophoectoderm gives rise to placenta
 - Safer method
3. POLAR BODY BIOPSY
 - only maternal component present
 - not preferred

PRE CONCEPTION & PRE NATAL DIAGNOSTIC TECHNIQUES [PCPNDT] ACT

- previously known as PNDT ACT
- formulated in 1994
- in effect on 1st Jan 1996
- amended in 2002 & 2003
- intended to stop female feticide [prohibition of sex selection]
- SEX RATIO [Female: Male]

India	→	943 / 1000
Haryana	→	877 / 1000
Daman	→	618 / 1000

BASIC PURPOSE

- prohibition of preconception & pre natal diagnostic techniques for determination of sex of fetus, leading to female feticide
- Prohibition of advertisement of PNDT techniques for detection or determination of sex
- Permission & regulation of use of PNDT techniques for purpose of detection of specific genetic abnormalities or disorders
- Permitting use of such techniques only under certain conditions by registered institutions

FEMALE FETICIDE

- Aborting a female fetus after sex determination
- PROBLEM OF FEMALE FETICIDE IS
 - ↑ violence against women
 - Abortion due to family pressures
 - more men in society due to sex selective abortion

THE TESTS WHICH ARE IN QUESTION

- ultrasonography
- Fetoscopy
- Taking samples of Amniotic fluid
- Embryo, blood or any tissue or fluid of Pregnant women assessed before or after conception
- testing samples in genetic laboratory to detect genetic disorders, abnormalities or sex linked diseases

CLINICS, MEDICAL PERSONNEL & SALE OF MACHINES : UNDER THE ACT

- only registered genetic clinics can use prenatal diagnostic techniques
- procedures can be done by a qualified medical practitioner
- prohibition on sale of ultrasound machine to unregistered laboratories, clinics & persons

ADVISORY COMMITTEE

CONSISTS OF

- 3 MEDICAL EXPERTS
 - ↳ Gynaecologists & obstetricians
 - ↳ Pediatricians
 - ↳ Medical geneticist
- 1 LEGAL EXPERT
- 1 OFFICER to represent the DEPARTMENT dealing with INFORMATION & PUBLICITY OF STATE GOVERNMENT
- 3 EMINENT SOCIAL WORKERS, atleast one from the women's Organisations

APPROPRIATE AUTHORITIES

STATE APPROPRIATE AUTHORITY

- consist of 3 members
 1. Additional Director of Health services [CHAIR PERSON]
 2. 1 Officer from Law department
 3. other eminent women activist

DISTRICT & CORPORATION AUTHORITIES are also present

POWERS OF APPROPRIATE AUTHORITIES

- Registration of Institutions
- Seal & seize
- Power to search & seize records
- cancellation or suspension of registration

PNDT can be used for detection of abnormalities like

- chromosomal abnormalities
- Genetic metabolic Diseases
- Haemoglobinopathies
- sex linked genetic diseases
- congenital abnormalities
- any other abnormalities

INDICATED WHEN

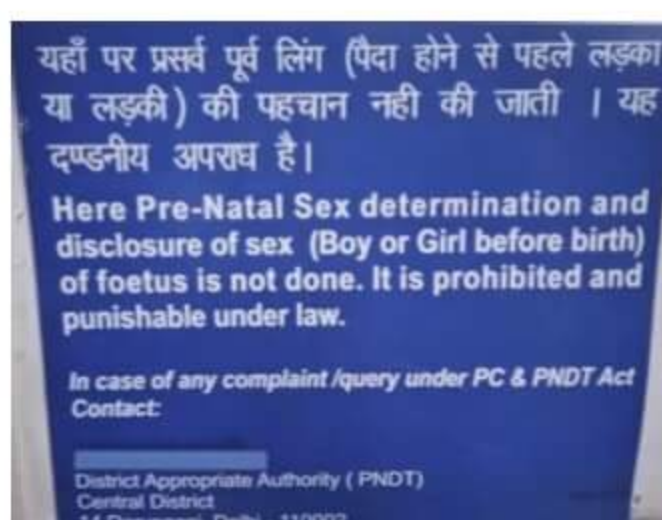
- Age of pregnant women is above 35 years
- 2 or more spontaneous abortions
- Pregnant women has been exposed to drugs, radiation, infection or chemicals
- Family history of mental retardation or Physical deformities in previous offspring

ESSENTIAL COMMUNICATIONS

- Explanation of all known side/after effects & test procedures
- written consent in prescribed form & its copy given to her
- Not to disclose sex of fetus by words, signs etc
- display prominently in local language that disclosure of sex of fetus prohibited under law
- Registration certificate to be displayed prominently in the clinic

AN UNDERTAKING

- That the Genetic counselling center, Genetic clinic & Genetic laboratory shall display prominently a notice that they do not conduct any techniques, test or procedure etc by whatever name called, for detection of sex of fetus or for selection of sex before or after conception



HUSBAND & RELATIVES can not ask or encourage pre - natal diagnostic techniques except for reasons permitted under law

FORM A → Prescribed application form which is to be filled in duplicate Affidavit assuring that the center will not indulge in sex determination

RENEWAL OF REGISTRATION

- The certificate is valid for 5 years
- Application for Renewal has to be made 30 days before the date of expiry in the prescribed form A

MAINTAINING PROPER DOCUMENTS

FORM G & F

- Prescribed formats in which Genetic & ultrasound clinics have to maintain records
- Every center has to maintain a register of forms F & G for every patient

FORM G

- The pregnant lady gives an undertaking that she does not want to know the sex of fetus

THE SONOLOGIST

- also signs a declaration that he has neither detected nor disclosed the sex of the fetus to anybody

COMPLETE REPORT

- All pregnancy related procedures information to be sent to the authorities by the 5th day of following month
- All the records have to be preserved for a minimum period of 2 years or in the event of any legal proceeding, till the final disposal of the legal proceeding

INFORM ABOUT THE CHANGES

Genetic Laboratory, Genetic clinic / Genetic counselling center shall intimate

OF CHANGE

- ↳ of employees
- ↳ places or
- ↳ equipment



WITH IN 30 DAYS

VIOLATION OF THIS ACT

- Imprisonment of 3 years & Rs 10000 [50,000] Fine, but subsequent conviction punishable i imprisonment for 5 years & Rs 50,000 [1,00,000] Fine
- offence to be cognizable, non - bailable & non - compoundable
- The later meaning the parties involved, can not take the case back

ADULT CIRCULATION - A RECALL

RIGHT HEART [deoxygenated blood]



LUNGS



Blood gets oxygenated



PULMONARY VEINS



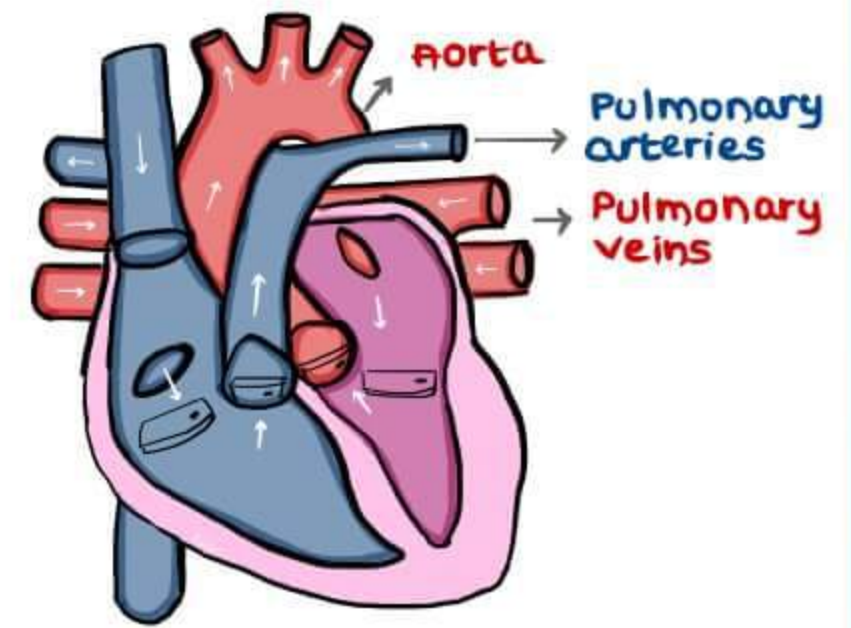
LEFT HEART [oxygenated blood]



LEFT VENTRICLE



Blood sent to all over the body via AORTA



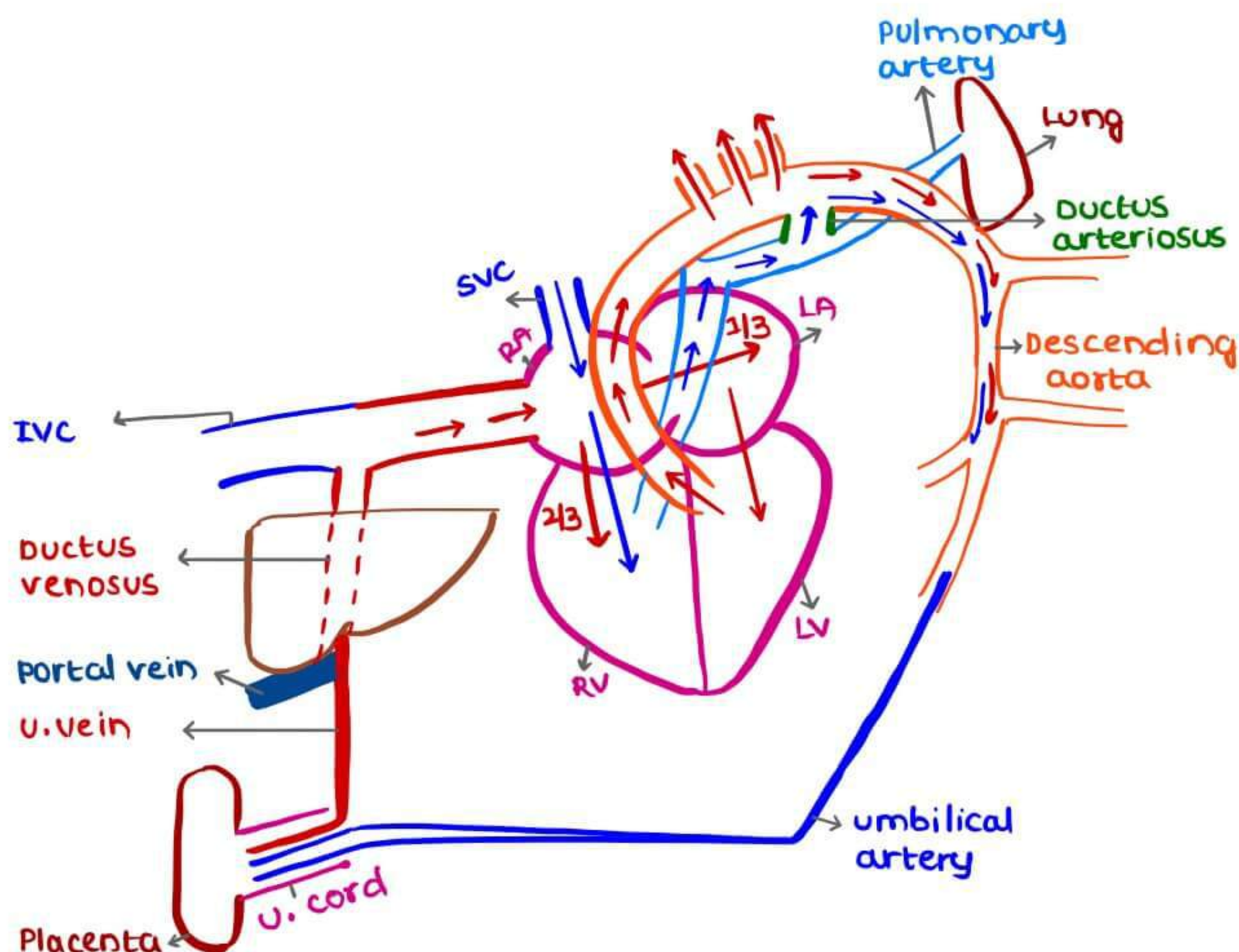
ADULT HEART	→	WORKS AS SERIES
FETAL HEART	→	WORKS AS PARALLEL

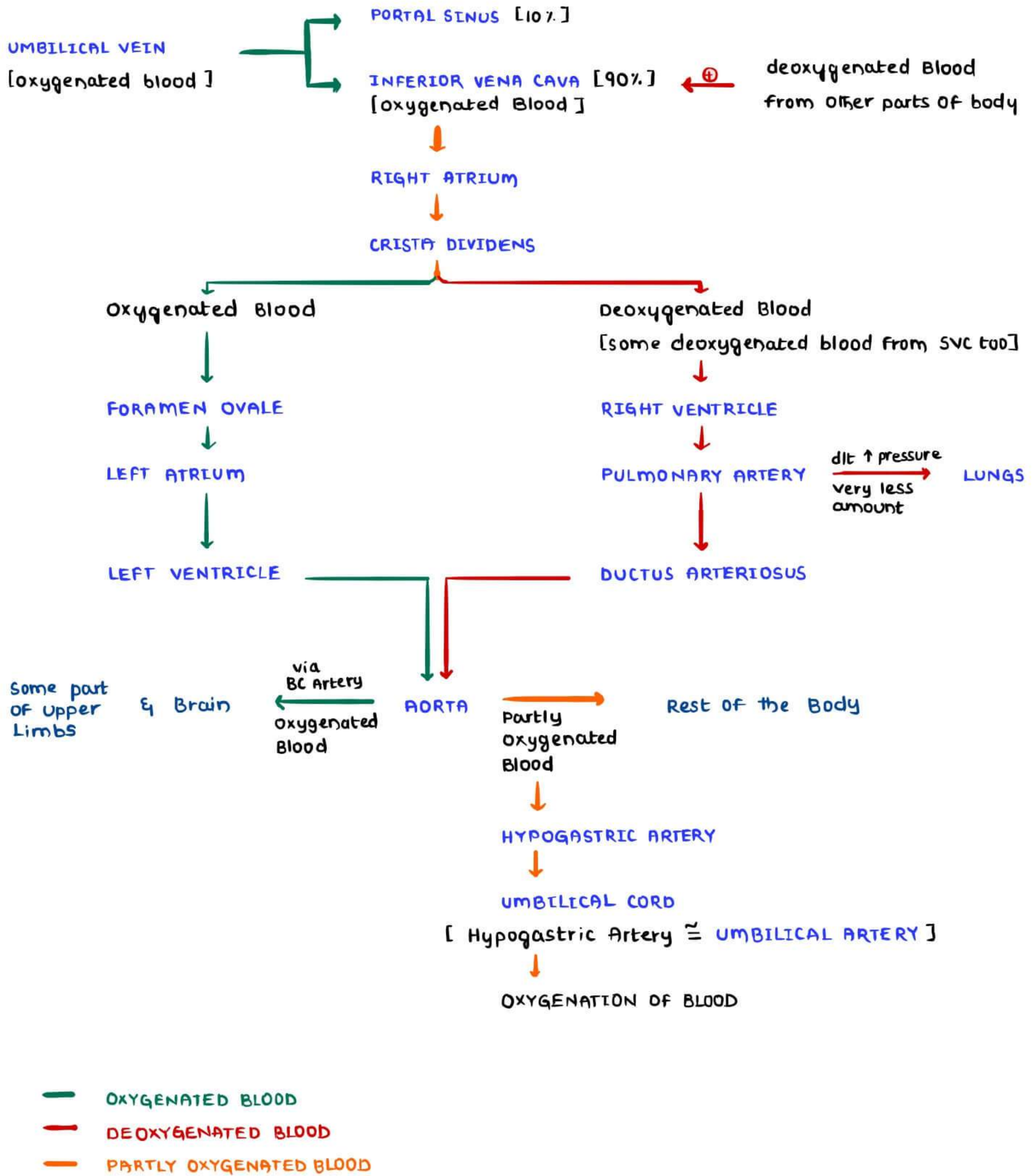
FETAL CIRCULATION

- Oxygen exchange occurs in placenta
- umbilical artery carries deoxygenated blood
- umbilical vein carries oxygenated blood

UMBILICAL CORD

- contains
 - ↳ 2 arteries
 - ↳ 1 vein [Right vein obliterated, left vein persists; "LEFT VEIN LEFT BEHIND"]





EVENTS AFTER BIRTH

STRUCTURE	PHYSIOLOGIC CLOSURE	ANATOMICAL CLOSURE	REMNANT
DUCTUS VENOSUS	10 - 96 Hrs after birth	2-3 weeks	Ligamentum venosum
DUCTUS ARTERIOSUS	Within minutes of birth	3-7 days	Ligamentum arteriosus
FORAMEN OVALE	Within minutes of birth	1 yr after birth	Fossa ovalis

FATE OF

- UMBILICAL VEIN → LIGAMENTUM TERES [Round ligament of Liver]
- UMBILICAL ARTERIES → UMBILICAL LIGAMENTS

CONTRIBUTORS OF AMNIOTIC FLUID

- MATERNAL CONTRIBUTION → in early pregnancy
- FETAL CONTRIBUTORS → fetal skin
- fetal urine [since 18-20 wks onwards]

AMNIOTIC FLUID FORMATION

- 1. Urine → 1000 ml [+]
- 2. Lung secretion → 350 ml [+]
- 3. Fetal swallowing → 750 ml [-]
- 4. Intra membranous fluid transport across the blood vessels on the surface of placenta } 400 ml [-]

AMNIOTIC FLUID PROPERTIES

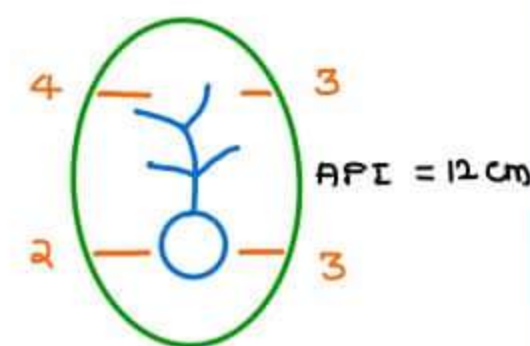
- pH → Alkaline [7.4 - 7.6]
- Specific gravity → 1.008 - 1.010
- colour → straw colored

TYPES OF COLOURS OF AMNIOTIC FLUID & ASSOCIATED CONDITIONS

- 1. Red → Antepartum hemorrhage [Abruptio]
- 2. Green → meconium staining liquor
- 3. Yellowish green → post term pregnancy
- 4. Tobacco juice → IUD
- 5. Golden yellow → Rh isoimmunization

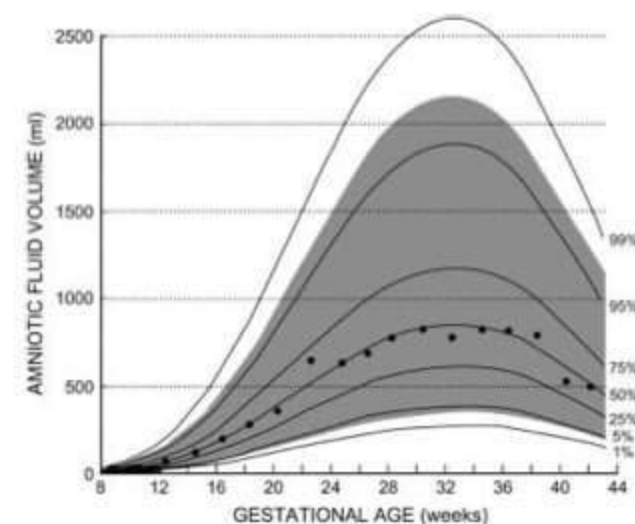
AMNIOTIC FLUID INDEX [on USG]

- Normal Amniotic Fluid Index → 10 - 15 [range 5-24] [1000 ml]
- OLIGOHYDRAMNIOS → < 5 [< 500 ml]
- POLYHYDRAMNIOS → > 25 [> 2000 ml]



SINGLE POCKET CRITERIA

- oligohydramnios → < 2 cm
- Polyhydramnios → > 8 cm



AMNIOTIC FLUID VOLUME VS GESTATIONAL AGE

- maximum at → 32-34 Weeks [1000 ml]
- At 36 weeks, AF is less than 32 weeks → EXTERNAL CEPHALIC VERSION IS POSSIBLE
- Around 40 weeks → 600 ml

OLIGOHYDRAMNIOS

CAUSES

- 1. Renal anomalies
- 2. IUGR
- 3. Preeclampsia
- 4. Premature rupture of membranes
- 5. Amniocentesis → Leak
- 6. Amnion nodosum
- 7. Post term pregnancy
- 8. NSAIDs
- 9. ACE Inhibitors

MANAGEMENT

- ↑ Fetal surveillance
- wait for lung maturity → Early delivery
- Amnion infusion

POTTER'S TRIAD

- Pulmonary hyperplasia
- Renal anomalies
- contracted & malfigured limbs & Flat / compressed faces
- Seen in severe oligohydramnios

POTTER SEQUENCE

- Pulmonary hyperplasia
- contracted & malfigured limbs & Flattening of Faces

POLYHYDRAMNIOS

- LIQUOR → > 25 AFI or > 2 liters of amniotic fluid
- ACUTE POLYHYDRAMNIOS → Polyhydramnios seen < 24 weeks of gestatⁿ
- > 25 - 30 → MILD [mc]
- > 30 - 35 → MODERATE
- > 35 → SEVERE [mostly a/w anomalies]

CAUSES

- diabetes → esophageal atresia
- twin gestation → Neural tube defects
- cleft lip palate → gastroschisis
- duodenal atresia

SYMPTOMS & SIGNS [maternal]

- dyspnea
- Orthopnea
- respiratory distress

TREATMENT

1. INDOMETHACIN [25 mg TID]
 - ↓ output of urine from fetus
 - should not use beyond 32 weeks
2. THERAPEUTIC AMNIOCENTESIS
 - at once 1500 ml can be aspirated in 30 min.
3. CONTROLLED ARTIFICIAL RUPTURE OF MEMBRANES IN LABOUR

LABOUR

STAGES OF LABOUR

- STAGE 1 → From onset of contractions to full dilatation of cervix
- STAGE 2 → From full dilatation of cervix to delivery of baby
- STAGE 3 → From delivery of baby to removal of Placenta
- STAGE 4 → Observatⁿ for 1 Hour

PHASES OF LABOUR

LATENT PHASE / PREPARATORY PHASE

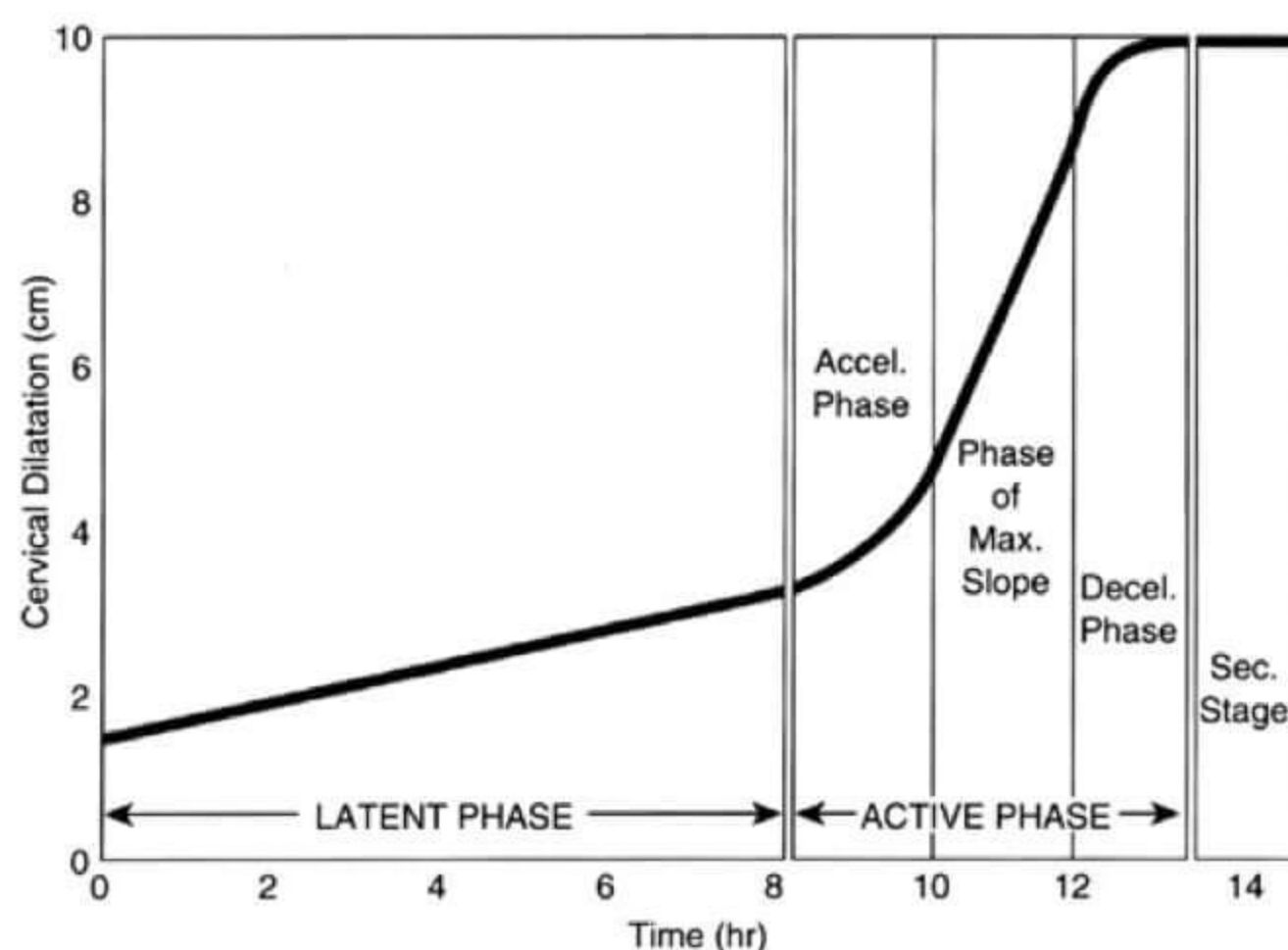
- 20 hrs in Primigravida
- 14 hrs in multigravida

ACTIVE PHASE / DILATATIONAL PHASE

- 10 - 14 hrs in primigravida
- 6 - 8 hrs in multigravida
- 12 hrs is the upper limit in most cases

→ includes

- Acceleratⁿ Phase
- Phase of max. slope
- Deceleratⁿ phase
- Second stage



MONITORING OF LABOUR

STATION OF LABOUR [ischial spine is the reference point]

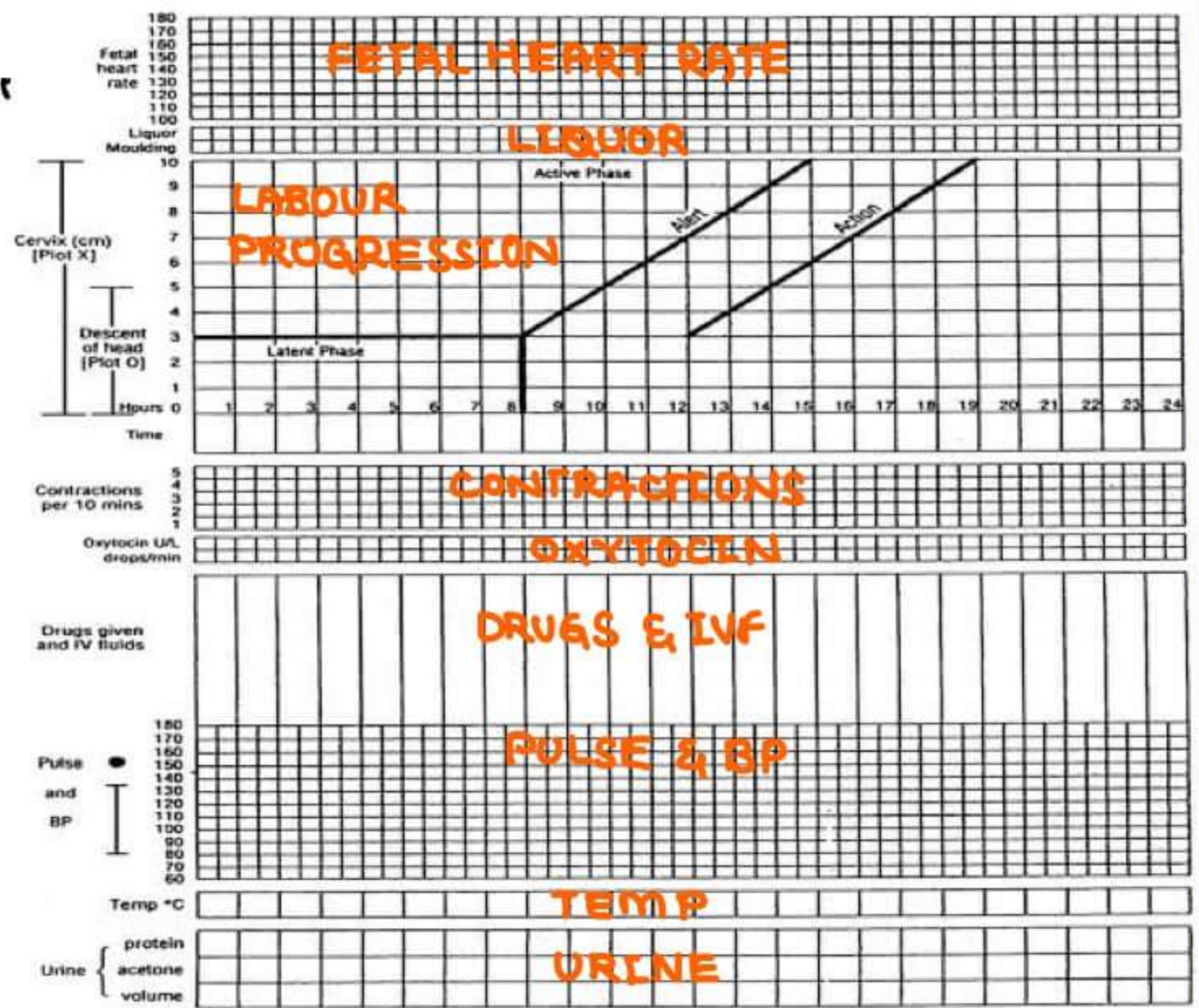
TIMING OF PER VAGINAL EXAMINATION

- When the cervix is dilated > 4cm & regular contractions + nt
- 2 Hourly PV exam in active phase
- PARTOGRAM [WHO]



- Alert line } Reference lines to check the progress of labour
- Action line }
- [partogram, we can monitor the progress of labour

- We can monitor
 - cervical dilatations } Progression of Labour
 - Descent of head }
 - Fetal Heart Rate
 - Liquor
 - contractions
 - Oxytocin administration
 - Drugs & IVF administration
 - Pulse Rate, BP
 - Temperature
 - Urine output etc



ACTIVE PHASE DISORDERS

→ **PROTRACTION DISORDERS** [slowing down]

- Dilatation of cervix → < 1.2 cm/hr in primigravida
→ < 1.5 cm/hr in multigravida
- Descent of Head → < 1 cm/hr in primigravida
→ < 2 cm/hr in multigravida

→ **ARREST DISORDERS** [Total stoppage]

- Dilatation of cervix → No change in last 2 hrs
- Descent of Head → No change in last 1 hr

BISHOP SCORE

BISHOP SCORE = (total)		Date of Bishop Score:/...../.....		
Score	0	1	2	3
Dilation	Closed	1 - 2	3 - 4	5
Length / Effacement	> 4	3 - 4	1 - 2	0
Consistency	Firm	Medium	Soft	—
Position	Posterior	Midline	Anterior	—
Head: station	-3	-2	-1, 0	+1, +2

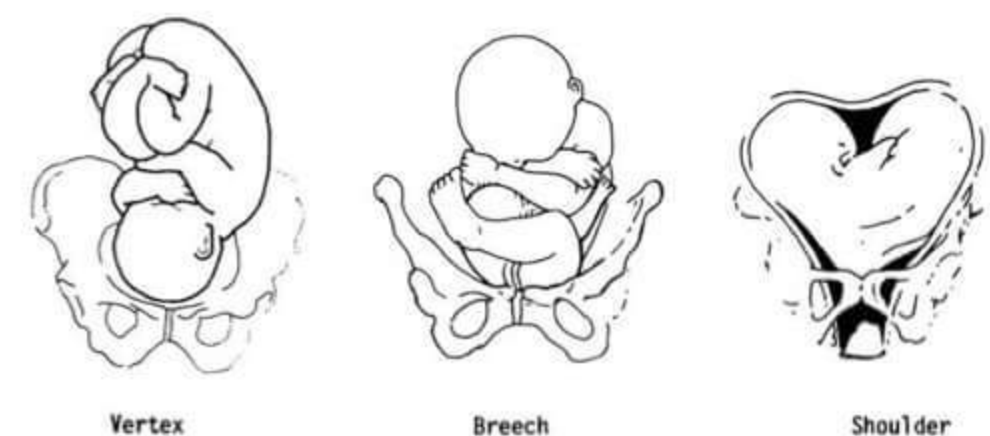
PRESENTATION

- Part of fetus in the lower segment is Presentation
- cephalic is the mc presentation
- Breech is the mc malpresentation [3%]

Management

Presented at the time of labour

- cephalic Presentation → can be delivered normally
- Breech Presentation → Trial of (N) delivery in an institutional set up under the guidance of experienced gynecologist
- shoulder Presentation → delivered by cesarean section



Presented at 36-37 wks

Cephalic Presentation	→	Normal Delivery	
Breach Presentation	→	Ext. Cephalic version	→ Normal Delivery
Shoulder Presentation	→	Ext. cephalic version	→ Normal Delivery

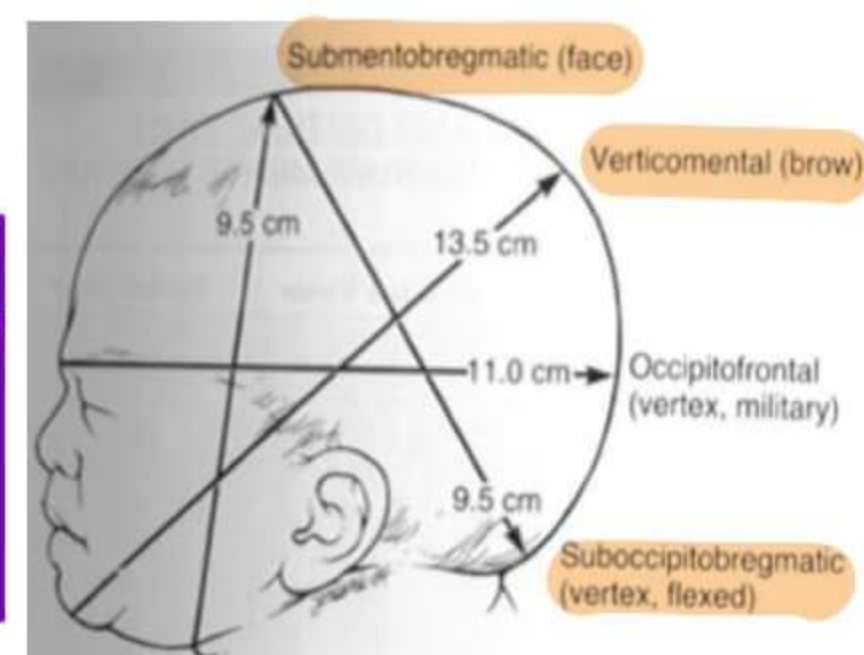
INTERNAL PODALIC VERSION

- Not done in transverse lie [Risk of uterine rupture] of singleton pregnancy
- can be done in transverse lie of 2nd baby in twin pregnancy
 - Reason → uterus is relaxed

LIE → Relatⁿ b/w the vertical axes of both mother & baby

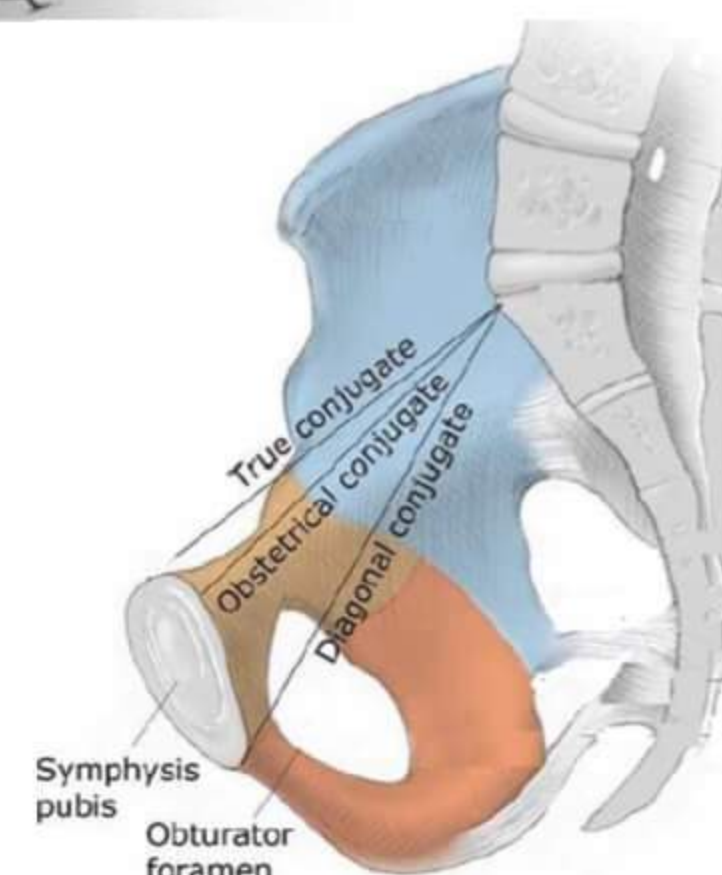
PRESENTING PARTS

Presentation	Engaging diameter	Mode of Delivery
Vertex	Sub occipitobregmatic (9.5cm)	Normal
Face	Submento bregmatic (9.5cm)	Normal
Brow	Verticomenatal (14cm)	Cesarean sect ⁿ



FEMALE PELVIS

- 55° inclined to horizontal
- Anatomical / True conjugate → 11 cm [DC-1]
- Obstetric conjugate → 10 cm [DC-2]
- Diagonal conjugate → 12 cm



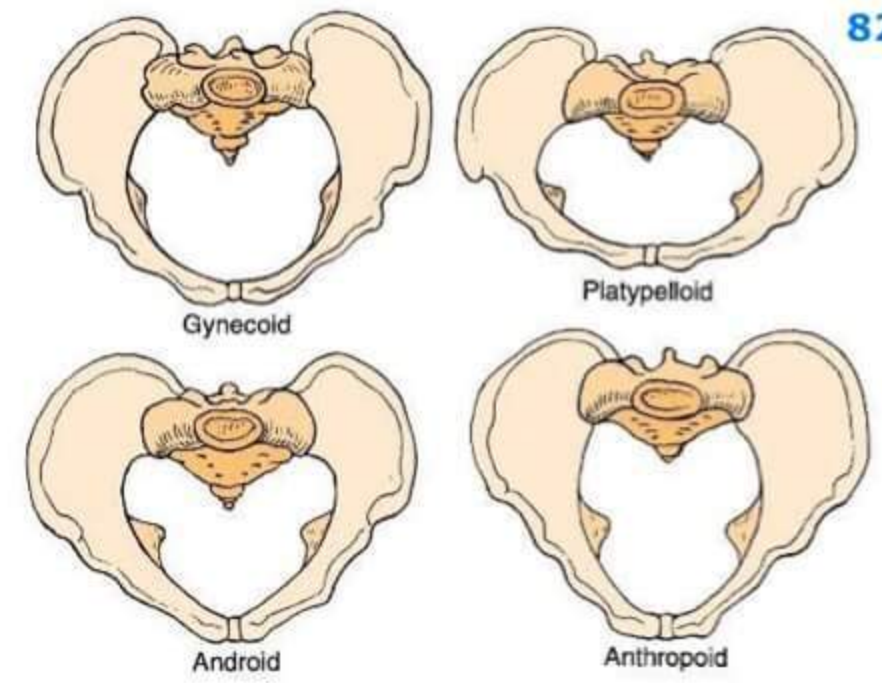
- ANATOMICAL CONJUGATE → top of pubic symphysis to sacral promontory
- OBSTETRIC CONJUGATE → back of pubic symphysis to sacral promontory
- DIAGONAL CONJUGATE → bottom of pubic symphysis to sacral promontory
- BISPINOUS / INTERSPINOUS DIAMETER → 10.5 cm
- Distance b/w Ischial tuberosities → 10.5 cm
- → < 8 cm → CONTRACTED OUTLET
- POSTERIOR SAGITAL DIAMETER → 7.5 cm
- CONTRACTED INLET / PELVIS → IF Obstetrical conjugate is < 10 cm
- IF Interspinous diameter is < 8 cm
- IF the summatⁿ of Posterior sagittal diameter & interspinous diameter is < 15.5 cm

VERTEX PRESENTATION

- mc position of vertex → LOT [40%] > LOA
- mc malpositⁿ of vertex → ROP [Right occipito posterior]

OCCIPITO POSTERIOR POSITION PROBABILITIES

- ① 80% becomes OccipitoAnterior
 - Mode of delivery → Normal
- ② 15-16% becomes Persistent OccipitoPosterior
 - occurs in Anthropoid pelvis
 - Mode of delivery → Face to Pubis delivery
- ③ 2-4% undergoes deep transverse arrest
 - occurs in android pelvis
 - Mode of delivery → Manual Rotatⁿ & forceps Extractⁿ
(Sagittal suture of baby should be in AP plane of pelvis.)
or
→ Cesarean Sectⁿ



BROW PRESENTATION

- Diameter of engagement → vertico mental
- Mode of Delivery → cesarean section

FACE PRESENTATION

- common PLATYPELLOID PELVIS

LT. mento anterior position

- mc positⁿ of face presentatⁿ
- Diameter of engagement → Submento bregmatic [9.5cm]
- Delivery occurs in flexion [Normal]

DIRECT Mento Posterior

- Rotates posteriorly [unfavourable rotatⁿ]
- Diameter of engagement → stembregmatic [17.5cm]
- Mode of Delivery → Cesarean section

MENTO POSTERIOR

- Becomes mento anterior by rotating 3/8th of the circle [favourable rotatⁿ]
- Mode of delivery → Normal in flexion

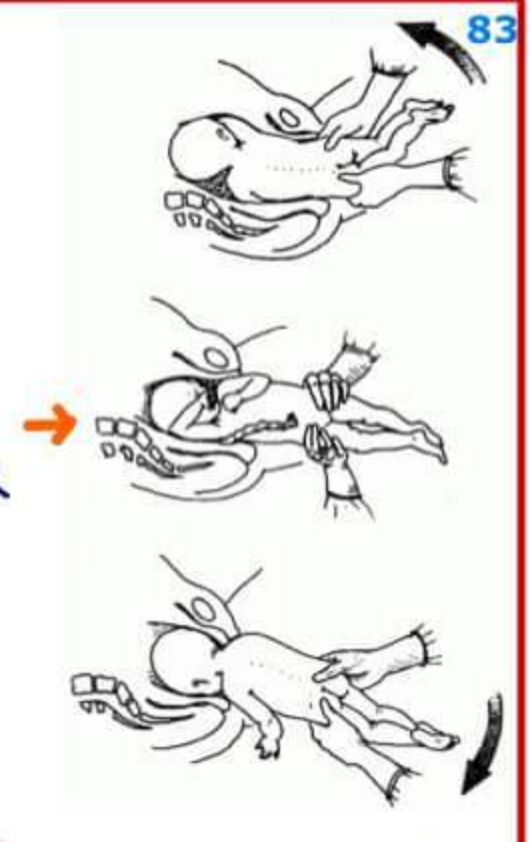
BREECH PRESENTATION

LEFT SACRO ANTERIOR POSITION

- mc positⁿ of breech presentation
- Attitude - Flexion
 - Legs comes out first
- Attitude - Extension
 - Buttocks comes out first
 - Deliver the extended legs by PINARD'S MANEUVER →

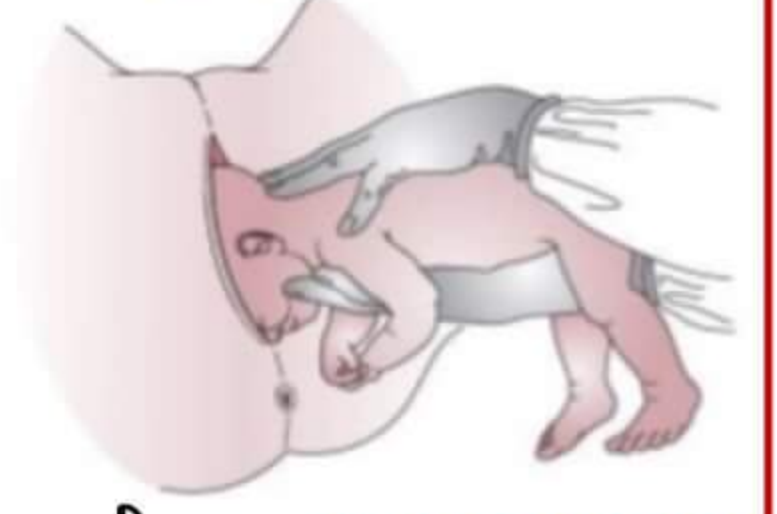


- Hold the baby at pelvic bone & pull the baby down
- FLEXED UPPER LIMBS
 - hold the upper limb from cubital fossa & pull it down
- EXTENDED UPPER LIMBS → delivered by LOVESET'S MANEUVER
 - pull the baby as low as possible
 - rotate the baby to one side
 - Hold the arm & pull it out from posterior roomy vagina

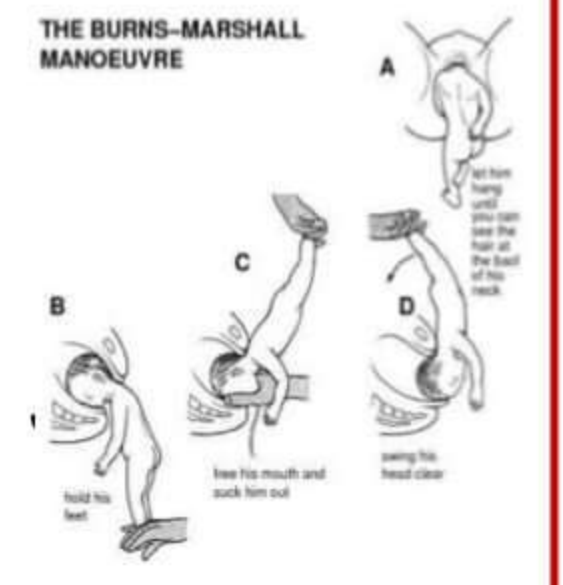


AFTER COMING HEAD DELIVERY BY

- ① PIPER'S FORCEPS [safest method]
- ② MAURICEAU-SMELLIE-VEIT MANEUVER
 - One hand
 - one finger on back of the head for flexⁿ
 - others on shoulders for tractⁿ
 - Other hand
 - Two fingers on malar bones or jaw for flexⁿ



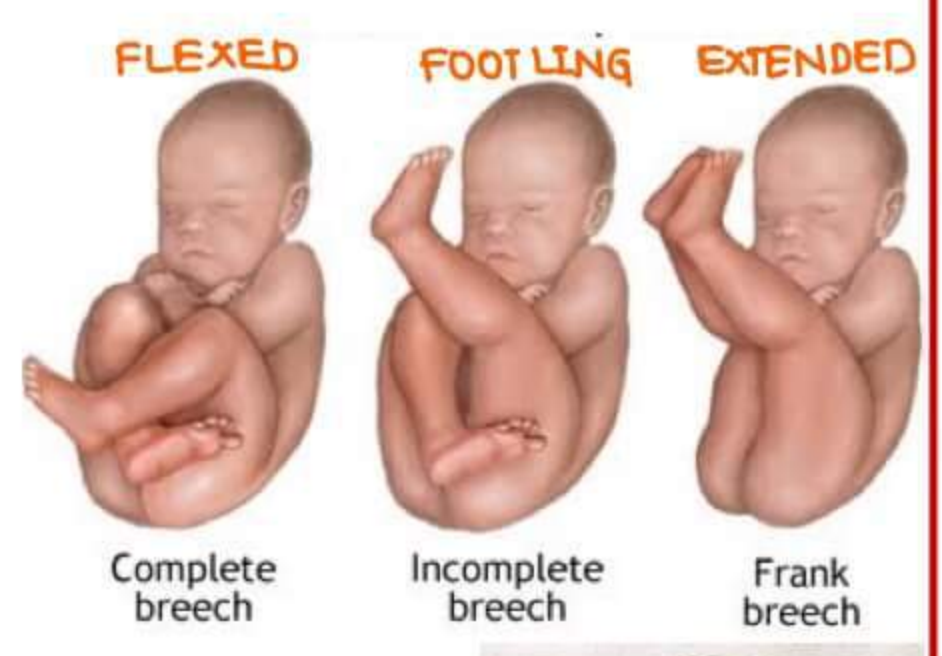
- ③ BURNS - MARSHALL MANEUVER
 - Let hang the baby till the nape of neck is visible
 - hold the feet
 - Swing the baby head upwards [in a circle of arc] & the head pops out in flexion



BREECH DELIVERY

VARIATIONS IN BREECH PRESENTATION

- complete Breech [Flexed]
 - Incomplete Breech [Footling]
 - frank Breech [Extended]
- mc breech } Frank Breech
 Best breech for vaginal delivery
- complete Breech can be delivered vaginally
 - footling Breech can be delivered by cesarean section
 - Breech in Extended head → STARGAZING SIGN on USG
 → indicatⁿ of cesarean sectⁿ



BREECH VAGINAL DELIVERY

→ Always prefer the breech in anterior position

① BREECH EXTRACTION

② SPONTANEOUS BREECH DELIVERY

③ ASSISTED BREECH VAGINAL DELIVERY

} done only for dead babies

→ NO touch till umbilicus delivered

→ For Extended legs → DO PINARD'S MANEUVER

for Extended arms → DO LOVESET'S MANEUVER

→ Delivery of after coming head

Ⓐ PIPER'S FORCEPS

Ⓑ MAURICEAU-SMELLIE-VEIT MANEUVER

Ⓒ BURNS - MARSHALL MANEUVER

FORCEPS DELIVERY

→ Forceps can be applied when head is fully rotated → The sagittal suture of the head lies in anteroposterior axis of pelvis

→ Forceps can also be applied even if the rotation of head is partial [$\leq 45^\circ$]

FORCEPS	VACCUM
APPLIED ON	APPLIED ON
→ fully rotated head or $< 45^\circ$ remaining	→ Rotated head or Non rotated head
→ fully dilated cervix	→ > 6 cm dilated cervix
→ stat ⁿ → +2 & below	→ stat ⁿ → +2 & below
→ membranes should be absent	→ membranes should be absent
→ Good contractions should present	→ Good contractions should present

SHOULDER DYSTOCIA

CAUSES

Large babies [≥ 4 kgs]

Post term pregnancies

Diabetes

Anencephaly [Net amount of oxytocin is ↓ed → post term pregnancy]

COMPLICATIONS

Erb's Paralysis [C_5, C_6 injury]

Klumpki's Paralysis [C_8, T_1 injury]

Fetal Hypoxia

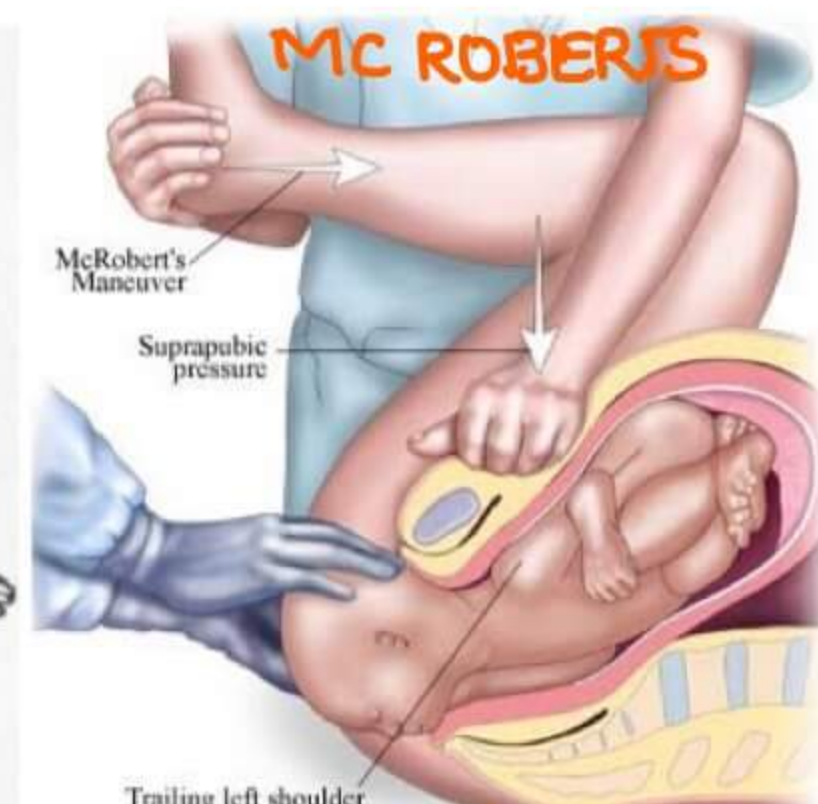
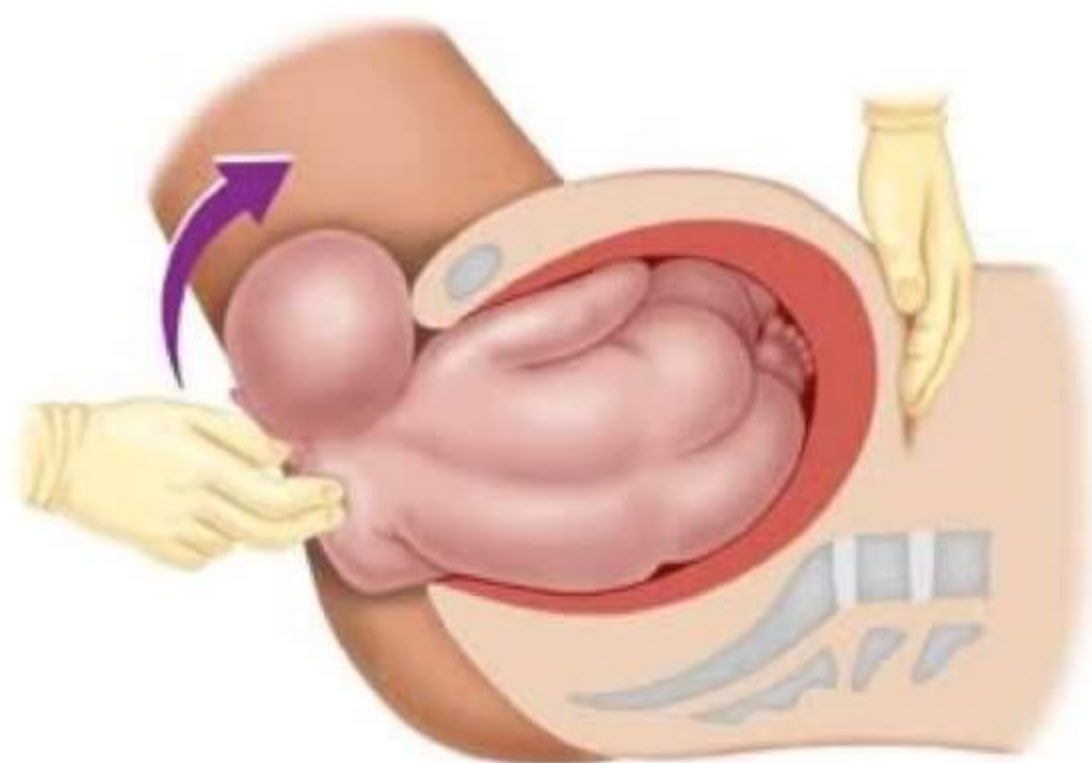
Neonatal morbidity & mortality

MANAGEMENT

→ CALL FOR HELP

MANAGEMENT

- ① SUPRA PUBIC PRESSURE
- ② Mc ROBERT'S MANEUVER
→ flex the hip joint >90°
- ③ WOODS CORK SCREW METHOD
- ④ ZAVANELLI RESTITUTION
- ⑤ GASKIN MANEUVER
→ in a knee chest positⁿ



WOODS CORK SCREW METHOD

ZAVANELLI RESTITUTⁿ

∟ CESAREAN SECTION

INDICATIONS

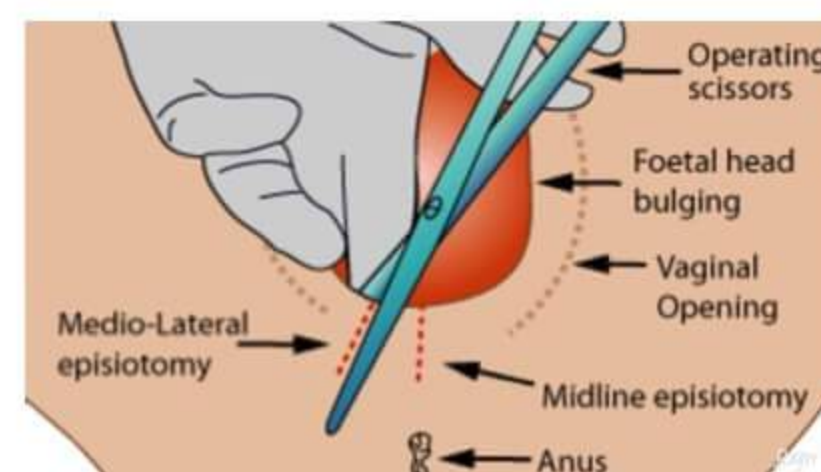
- Breech
- Instrumentatⁿ
- Large baby
- Persistent occipito posterior
- Shoulder dystocia

COMPLICATIONS

- Rectal incontinence
 - Flatal incontinence
 - Fecal incontinence

TYPES

- MEDIAN
- LATERAL [mostly avoided]
- MEDIOLATERAL



STRUCTURES RESECTED

- Skin
- Sub cutaneous tissues
- Superficial, Deep transverse perineal muscles
- Bulbospongiosus, Levator ani
- Transverse perineal branches of pudendal nerves & vessels
- Posterior vaginal wall

	MIDLINE EPISIOTOMY	MEDIO LATERAL EPISIOTOMY
REPAIR	more Easier	Easier
HEALING	Faster & better	Latē
BLOOD LOSS	Minimal	more
SCAR WOUND	Even	Uneven
DYSPARUNIA	Rare	occasional
POST OP PAIN	Lesser	more
WOUND EXTENS ⁿ	More common	Less common

- from immediately after delivery to 4-6 wks of time
- Immuno compromised state

CHANGES DURING PUERPERIUM

- ① REPRODUCTIVE ORGAN CHANGES
- ② SYSTEMIC CHANGES
- ③ ABNORMAL CHANGES
 - Endometritis
 - wound infections
 - mastitis
 - Deep venous Thrombosis

REPRODUCTIVE ORGAN CHANGES

UTERUS

- 1000gms of uterus returns to 100 to 200 gms
- size
 - immediately after delivery → just below the umbilicus
 - Best time to do Puerperal sterilizatⁿ → 2-3 days
 - uterus becomes a pelvic organ in → 10-14 days
 - maximum time to do puerperal sterilizatⁿ → 7-10 days
 - uterus becomes a normal organ in → 4-6 wks

CERVIX

- becomes firm
- Epithelium starts to regrow
- Transformⁿ zone starts to reform [more susceptible to CA cervix]
- cervix closes by 3 wks

VAGINA

- starts shrinking
- Rugae starts to reform from 2nd to 3rd week
- Epithelium starts to grow from 4 to 6 wks

BREAST

- sudden drop of hormones [Estrogen] } LACTOGENESIS
- increase in Prolactin }
- COLOSTRUM
 - produced in 1st 2-3 days
 - rich in Ig A & Ig G, proteins fats
- after 3 days, milk productⁿ starts to increase
- IF the women doesn't breastfeed, Breast will be normal in 3 wks

LOCHIA

- LOCHIA RUBRA → 1st to 4th day, RED [mostly blood]
 LOCHIA SEROSA → 5th to 9th day, YELLOW [mostly mucus, some RBC]
 LOCHIA ALBA → 10th to 14th day, WHITE [mostly epithelial cells]

ABNORMAL CHANGES

PUERPERAL FEVER

- any fever in 1st 10 days after delivery
 → Temp → $> 38^{\circ}\text{C}$ [100.4°F]
 → mc cause → Endometritis

ENDOMETRITIS

Causes

- Enteric bacteria [mc]
 → Local commensals
 → Group A β hemolytic Streptococci [mc]
 → E. coli, Klebsiella [Gram -ive]
 → Chlamydia [mc cause of late endometritis]

Clinical features

Symptoms

- Fever
 → Pain abdomen
 → Dirty, foul smelling discharge
 → Fatigue, weakness

Signs

- Lower abdomen tenderness
 → on P/V Examination
 - Uterine & adnexal tenderness
 - Fullness of Pouch of Douglas

INVESTIGATIONS

- \uparrow leucocytes on CBC
 → \uparrow ESR, \uparrow CRP

TREATMENT

- CLINDAMYCIN + GENTAMYCIN [Gold standard] [90-97% Success Rate]

MASTITIS

- mc cause → Staphylococcus aureus

Clinical features

- Engorged breast
 Tender breast
 Fluctuant mass +nt

TREATMENT

- stop breast feeding
- express milk in moist heat
- Oxytocin
- Analgesics
- Antibiotics
 - cephalosporins
 - penicillins

URINARY TRACT INFECTIONS

- mc cause → E.coli
- culture sensitivity should be done

Management

- Cephalosporins
- Penicillins
- Nitrofurantoin

DEEP VEIN THROMBOSIS

- accompanies the endometritis

Clinical features

- Pain
 - in Abdomen or in Pelvis
 - Radiating to thigh
- ↑ Pulse Rate
- fever

INVESTIGATIONS

- ↑ WBC
- ↑ ESR
- ↑ CRP
- DO CT Scan/ MRI → to localise the thrombus

TREATMENT

- Bed Rest
- Limited physiotherapy
- IV antibiotics [clindamycin + Gentamycin]
- Heparin 5000 IU - 10000 IU BID
 - INR should be > 2

ENDOCRINE DISORDERS

- Post Partum Thyroiditis
- Graves disease
- Sheehan Syndrome [Post Partum Pituitary Necrosis]

POSTPARTUM THYROIDITIS

- dit Acute destructive Lymphocytic thyroiditis
- Hyperthyroidism
 - in first 1-4 months
 - Rx \bar{c} PROPRANOLOL
- hypothyroidism
 - in later 4-8 months
 - Rx \bar{c} Thyroxine Supplementatⁿ

SUB INVOLUTION

- Normal rate of reductⁿ of size of uterus → 1-2 cm/day

Causes

- Retained bits of placenta & membranes
- infectⁿ
- Blood clots
- Fibroids

Clinical features

- Bloomy or Flabby uterus
- Palpable beyond 10 days per abdomen
- Tender
- Fever + nt

TREATMENT

- Empty the uterus by Gentle curettage after doing USG
- IV Antibiotics
- Methyl Ergometrin Tablets
 - 0.2 mg TID x 5-7 Days

PSYCHIATRIC DISORDERS

- | | | |
|------------|---------------------|--|
| Blues | → in 1st 2 weeks | [50-60%] [dit sudden loss of Progesterone] |
| Psychosis | → in 1st 2-3 months | [<1%] |
| Depression | → In 1st 3-6 months | [10-15%] |

POST PARTUM HAEMORRHAGE is also the part of abnormal puerperium

- good Rate of CS in any hospital
- Most institute CS rate
- 18 - 25% overall
- 30 - 35% is acceptable

REASONS FOR INCREASED INCIDENCE OF CS

- No. of children reducing
- ↑ age at pregnancy
- more use of electronic fetal monitoring
- ↓ trial in previous CS & breach
- cDMR [caesarean delivery on maternal request]

INDICATIONS OF CS

MATERNAL INDICATIONS

- Previous CS
- abnormal placentation
- classical CS
- Scar dehiscence
- full thickness myomectomy
- Genital tract Obstructive mass
- Invasive cervical cancer
- Prior Trachelectomy
- permanent cerclage
- reconstructive surgeries
- Pelvic deformities
- HSV or HIV Infection
- cardiac & pulmonary disorders
- cerebral aneurysm
- Perimortem CS

MATERNAL - FETAL INDICATIONS

- cephalopelvic Disproportion
- failed operative vaginal delivery
- Placenta Previa
- Abruptio i fetal distress

FETAL INDICATIONS

- Non - assuring fetal heart pattern
- Malpresentation
- congenital anomalies
- abnormal doppler studies
- prior fetal birth trauma

CAESAREAN SECTION

- mortality rate 7/100000 as compared to Normal delivery [3-4/1,00,000]

ADVANTAGES FOR MOTHER

- much less prolapse
- much less urinary incontinence

ADVANTAGES TO BABY

- ↓ neonatal mortality [< 1%]
- ↓ skin laceration
- ↓ cephalohematoma
- ↓ skull & clavicle fracture
- ↓ Brachial plexopathy
- ↓ facial nerve injury

PROCEDURE

1. consent
2. Antacid 30 ml → to prevent MENDELSON SYNDROME [aspiration pneumonitis]
3. Regional anesthesia [neuraxial]
4. sensory block should be at T₄ level & below
[Epidural anesthesia in Normal delivery should be at T₁₀ to L₁ & S₂-S₄]
5. Best Position → Supine i wedge under the right hip
6. Prophylactic ANTIBIOTCS → cephalosporin [cefazoline] 1gm once [no routine AB]

7. PREPARATION OF ABDOMEN

- shaving not done
- Clipping of pubic hair can be done

8. CHECK the fetal Heart sound prior to incision in OT

9. Decision to delivery should not be more than 30 minutes

10. TECHNIQUE

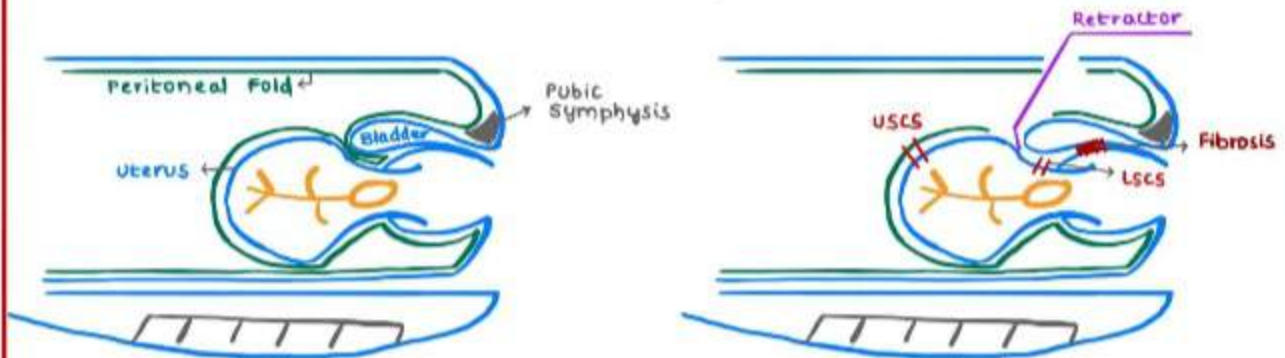
TECHNIQUE

ABDOMINAL INCISION

- Easy & fast incision → vertical
- Preferred incision → transverse / bikini incision / pfannenstiel incision / maylards incision

SIDE EFFECTS OF LOWER ABDOMINAL INCISION

- Ilioinguinal nerve damage
- Iliohypogastric nerve damage
- Superior & inferior epigastric vessel damage



CLASSICAL CS : UPPER SEGMENT CS INDICATIONS

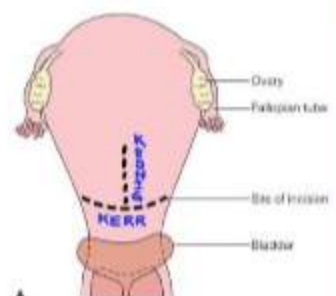
1. BLADDER FIBROSIS [mc indication]
2. LOWER SEGMENT TUMORS Like Fibroid, ca cervix
3. POST MORTEM CS

LSCS	CLASSICAL CS
→ Easy to repair	→ difficult to repair
→ Less bleeding	→ more bleeding
→ heal faster	→ slow healing
→ Passive low segment [retracts in labor]	→ no trial of ND is possible
→ trial is possible [VBAC]	→ rupture rate → 8-10%.
→ rupture rate → 0.5 - 2%.	

INCISION ON UTERUS

LOWER SEGMENT INCISIONS

1. KERR'S Incision
 - transverse incision
 - MC incision on uterus
2. KRONIG Incision → vertical incision



CS COMPLICATIONS

- Hemorrhage
- Sepsis, peritonitis
- Endometriosis
- Thromboembolism
- Anesthesia complication
- visceral injuries
- Fetal injuries
- Hysterectomy

LATE COMPLICATIONS

- incisional Hernia
- Seroma formation
- Scar rupture
- wound break down
- Infertility

PREVIOUS LSCS SCENARIO, TRIAL OF SCAR Performed

- VBAC [vaginal Birth After caesarean]
- TOLAC [Trial of Labour After caesarean]

- it should be in institutional setup
- should not be CPD
- previous 1 LSCS
- Rupture of uterus can happen
 - ↳ Partial [dehiscence]
 - ↳ Total

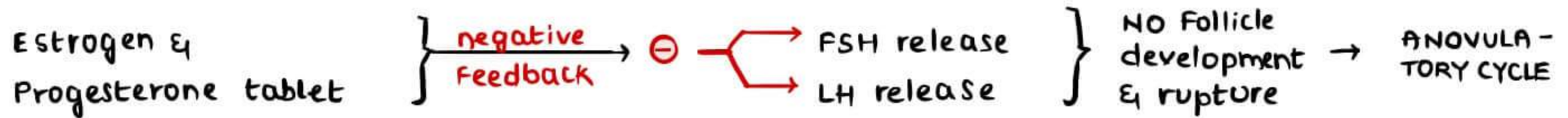
- SIGNS OF RUPTURE OF UTERUS IN A VBAC / TOLAC
 - ↳ maternal tachycardia [1st sign]
 - ↳ vaginal bleeding, ↓ BP
 - ↳ fetal distress [Late sign]



HORMONAL CONTRACEPTION

COMBINED ORAL CONTRACEPTIVE PILLS [C.OCP]

MECHANISM OF ACTION



Patient on c.OCP have

- ANOVULATORY CYCLE
- LESS DYSMENORRHEA
- PILL PERIOD / ARTIFICIAL PERIOD
 - ↳ have menstruation dlt EIP Pill [not dlt natural EIP]
 - ↳ have monthly periods dlt Exogenous Estrogen & progesteron which causes follicle proliferation & secretion respectively
- REGULAR PERIODS
 - ↳ C.OCPs are given for 21 days & patient will have period on 28th day
- LESS BLEEDING & LESS ANEMIA
 - ↳ dlt Low dose Estrogen [Ethinylestradiol 0.03 mg / 30 µg], causes minimal endometrial proliferation

BENEFITS

- | | |
|---------------------------|------------------|
| → ↓ Endometrial cancer | → ↓ Fibroid |
| → ↓ ovarian cancer | → ↓ Ovarian cyst |
| → ↓ colon cancer | → ↓ PID |
| → ↓ Benign Breast Disease | |

ADVERSE EFFECTS

- ↑ ADENOCARCINOMA CERVIX [not Squamous cell cancer (mc type of cervical cancer)]
- ↑ SMOOTH TYPE GALLSTONES, not a/w GB cancer [mixed, pigment stones a/w GB cancer]
- ↑ HEPATIC ADENOMA [not HCC]
- ↑ CHLAMYDIA PID [indolent]

NO EFFECT ON BREAST CANCER INCIDENCE

USAGE

- Started on Day 1-5 of menstrual cycle
- QUICK START PROTOCOL
 - ↳ Start anytime of menstrual cycle
 - ↳ mainly for low socioeconomic & teenage patient
- MISSED PILL
 - ↳ Missed 1 → take 2 on next day
 - ↳ missed ≥ 2 → take pill on the day + next 7 days → another method

CONTRAINDICATIONS

- Pregnancy
- Breast Feeding
- Deep venous thrombosis / pulmonary embolism
- Liver Disease : cirrhosis, hepatitis, cancer
- HTN $> 160/100$ mm Hg
- Age ≥ 35 yrs + smoker
- Active breast cancer
- Diabetics \bar{c} neuropathy or nephropathy
- Ischemic heart disease / stroke
- migraine \bar{c} aura

NOT A CONTRAINDICATION → STD / PID / HIV

TYPES OF OCPs

- TYPE I → High dose
- TYPE II → Low dose
- TYPE III → NEWER PROGESTINS [$\downarrow\downarrow$ androgenic action]
 - Desogestrel
 - Norgestimate
 - Gestodene
- TYPE IV → DROSPIRENONE
 - ACTIONS OF Drospirenone
 - ↳ Progestation
 - ↳ anti androgenic
 - ↳ anti mineralocorticoid
 - good for those \bar{c} pre menstrual dysphoria & acne
 - COMBINATION → 3 mg Drospirenone & 20 mg EthinylEstradiol
 - ↳ this combinatⁿ will give Regular cycle & good antiandrogenic action
 - Given via 24/4 PROTOCOL , 24 days of pills & 4 days gap

MINIPILL / PROGESTERONE ONLY PILL [POP]

- should maintain same time consumption / within 3 hours the next day

DESGESTREL

- NEWER MINIPILL
- S/E → irregular spotting
- Excellent for lactating women

SAHELI [CENTCHROMAN]

- developed by CDRI [Lucknow]
- ORMOLOXIFENE → makes endometrium out of phase & implantation is ↓ed
- USAGE → twice/week for 3 months, then once/week till the contraception is desired
- S/E → delayed cycles

PERMANENT METHODS

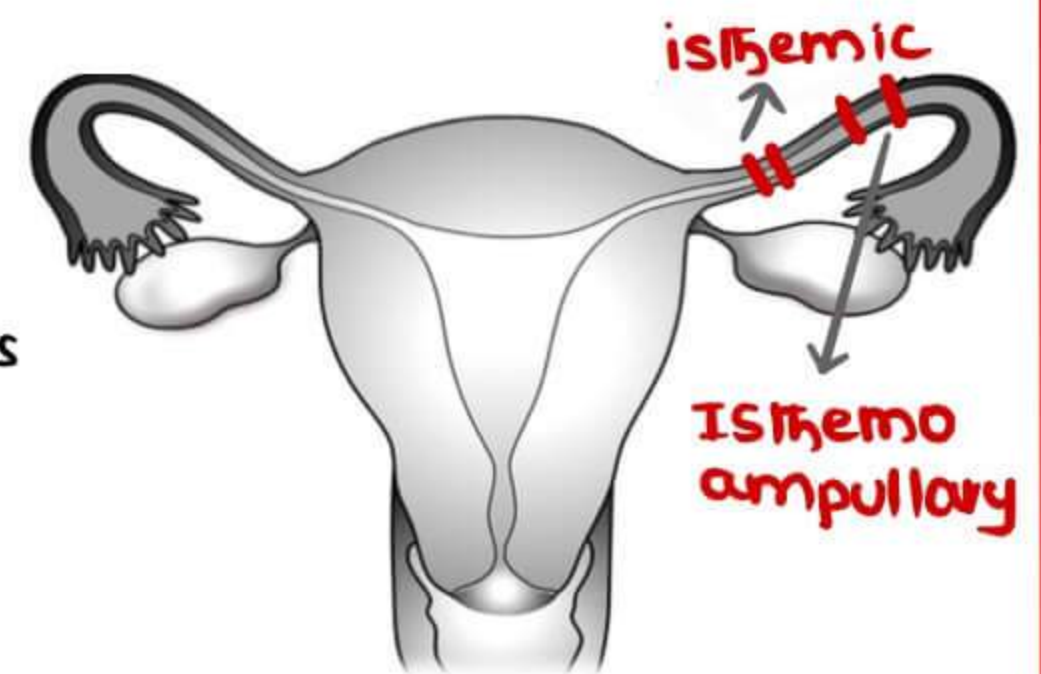
- Q. WHEN TO DO : SOUND ADVICE [not a guide line]
 A. For those ≥ 2 children atleast & last child preferably > 3 years

FEMALE STERILIZATION

SITE OF LIGATION ON FALLOPIAN TUBE

ISTHMIC STERILIZATION

- Isthmoisthmic reanastomosis has upto 80% success
- prefer ligate at isthmic area



TUBECTOMY

- MC time in India → Post partum [Puerperal]
 - ↳ Immediately after delivery, uterus is at the level of umbilicus, as uterus is an abdominal organ, it is easy surgery

PUERPERAL STERILIZATION [PS]

- Best done within 2-3 days after delivery
- upper limit is 7-10 days
- Uterus becomes pelvic organ in → 10-14 days
- becomes normal organ in → 4-6 weeks

INTERVAL STERILIZATION

- Done after 6 wks of delivery
- Done by Laparoscopic methods.

CONCURRENT STERILIZATION

- Done along with MTPs or cesarean section

ENTRY INTO ABDOMEN is by

1. LAPAROTOMY [MINILAP (1.5 to 2 inch incision)]
2. LAPAROSCOPY
 - generally for interval sterilization
 - Never do in Puerperium
 - ↳ can cause injury
 - ↳ failure chances is more

TECHNIQUES

1. POMEROY TECHNIQUE

- m/cly done
- Single ligature is used
- tube cut end are together
- can lead to fistula formation

2. PARKLAND TECHNIQUE

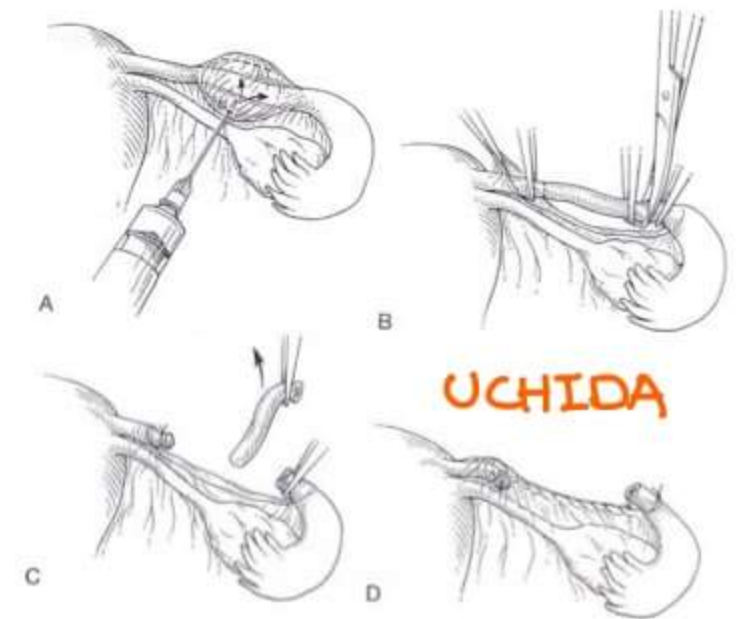
- Double ligature is used
- tubes are ligated separately

3. IRWING PROCEDURE

- one end of tube is anastomosed into uterine musculature
- other end of tube is anastomosed into mesosalpinx

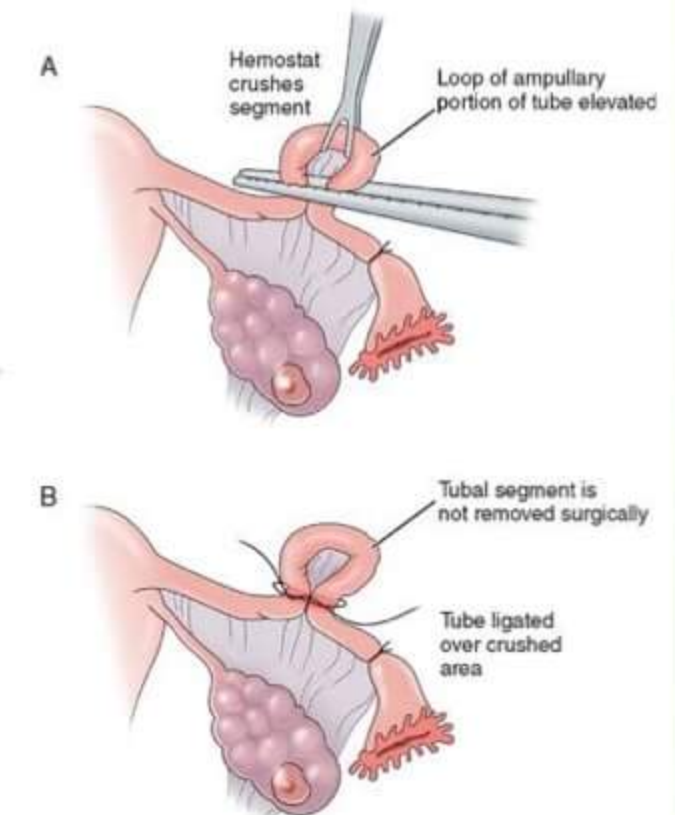
4. SUBMUCOSAL DISSECTION OF TUBE [UCHIDA'S PROCEDURE]

- Serosa is lifted by needle & saline is injected
- Then serosa is incised & Tube is resected
- Serosa is sutured again
- Fibrosis & adhesions are very less, as cut ends are within the serosa



5. MADLENER'S METHOD

- Tubes are crushed, not resected
- High failure rates, not done these days



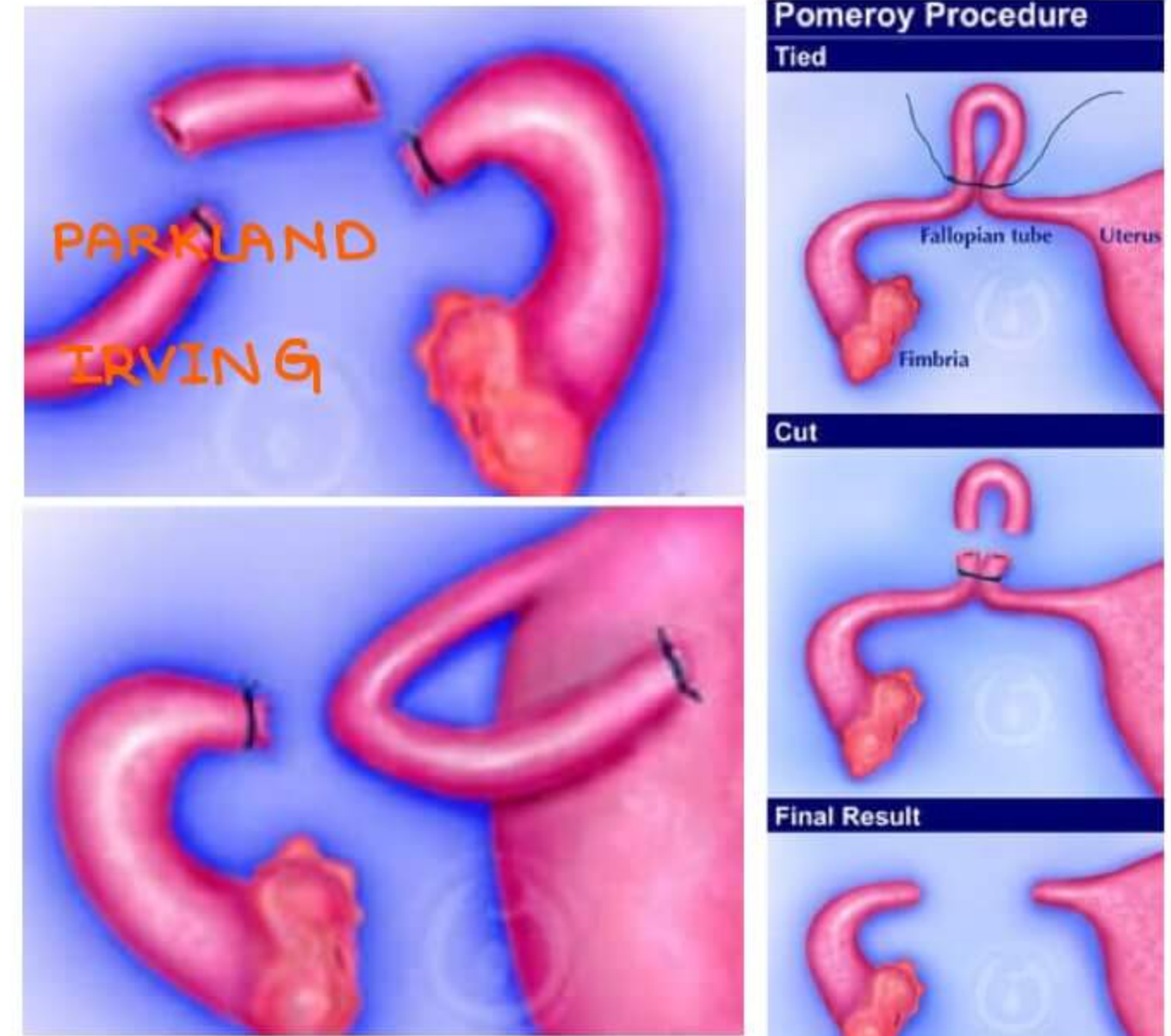
6. KRONER'S FIMBRIECTOMY

- NO reversal is possible
- not done these days



STRUCTURES LIGATED BY MISTAKE

- Round ligament [mc]
 - Small bowel
 - ovarian ligament
 - Appendix
- ~~→ Ureter~~
~~→ uterine artery~~
- } can't be ligated by mistake
as they are retroperitoneal



BASIC STEP TO FOLLOW TO AVOID LIGATING OTHER STRUCTURES

- After pulling out the structures \bar{c} BABCOCK'S FORCEP [atraumatic grip], always look for fimbriae & then ligate

FAILURE RATE OF TUBECTOMY IS MORE THAN VASECTOMY

VASECTOMY

- Least failure rate in permanent method
- much easier to do vs tubectomy
- NON SCALPEL VASECTOMY can be done
 - We stabilize \bar{c} RING FORCEP, pull out the vas deferens \bar{c} sharp artery forcep & ligate it

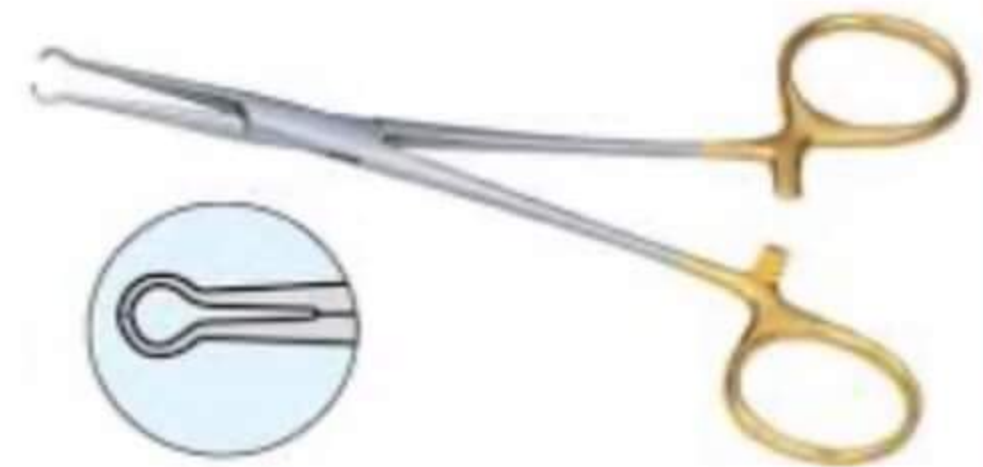
- avoid heavy weight lifting

SIDE EFFECTS

- ↳ dragging pain
 - ↳ Hematoma
 - ↳ infections
 - ↳ Epididymitis
 - ↳ Sperm build up
 - ↳ antisperm antibody can be form
- sperm present in part distal to ligation can still cause pregnancy
 - for 3 months or 30 ejaculation, whichever is later → use barriers or other contraceptives
 - After 3 months, sterilization should be confirm by semen analysis. It should show azoospermia



Babcock's
forcep



Ring forcep

ESSURE RING

- Hysteroscopic implant of ESSURE RING
- made up of NITINOL [Alloy of Nickel & Titanium]
- causes fibrosis & blockage of tube
- can be done under local & GA
- takes 3 months to completely block the tube
- Hysterosalpingography done to confirm blockage



ESSURE RING

GYNECOLOGY

MENSTRUATION, MENOPAUSE, CONCEPTION, CONTRACEPTION, INFERTILITY

MENSTRUATION

PRIMORDIAL FOLLICLES

- 6-7 millions at 20 weeks of IU Life
- 1-2 millions at birth
- 3-4 Lacs at Puberty
- 400-450 utilized

CASE 1 → Women in whom fertilizatⁿ occurs

- FIMBRIA OVARICA → Extra long fimbria which takes up oocyte
- Life of oocyte → 24 hrs to 48 hrs [Best answer → 24 hrs]
- Sperms fertilize oocyte in ampulla
- Embryo reaches the uterine cavity on 3rd day of ovulatⁿ
- IMPLANTATION WINDOW
 - ↳ Implantatⁿ on secretory or ripened endometrium on 6th to 9th day or 20th to 24th day of the menstrual cycle
 - ↳ Progesterone is responsible for secretory endometrium
 - ↳ source → corpus luteum [follicle]
- Estrogen is responsible for Proliferatory endometrium [Source → follicle]

CASE 2 → Women in whom fertilizatⁿ does not takes place

CORPUS LUTEUM

- Start to degenerates [max functⁿ] at → 9th to 10th day
- Complete degenatⁿ at 14th to 15th Day → SHEDDING OF ENDOMETRIUM
- Progesterone withdrawal is responsible for Shedding of endometrium
- Length of cervix → 3.5 to 4cm
- Short cervix → ≤ 2.5 cm

MITTLESHMERZ / MID CYCLE PAIN → dit blood & debris [from follicle] collected into POD AT THE TIME OF OVULATION

DYSMENORRHEA [pain of menstruatⁿ] → dit uterine contractions
Prostaglandins are responsible

CASE 3 → ANOVULATORY CYCLES

- No MITTLESHMERZ / mid cycle pain
- Irregular [dit intermittent recoil of uterus]
- Painless [dit No/Less Prostaglandins]
- OVULATORY CYCLES ARE REGULAR & PAINFUL

DYSMENORRHEA

TYPES

PRIMARY/SPASMODIC DYSMENORRHEA

- Pain starts 30 min before onset of periods & stays 10 hrs post onset
- Seen in Normal woman

CONGESTIVE/SECONDARY DYSMENORRHEA

- Pain starts 3-4 days prior and stays throughout menses
- Seen in PID & endometriosis

MEMBRANOUS DYSMENORRHEA

- Fibrinolytic system in uterus is responsible for less/non clumping of blood
- Total absence of fibrinolytic system → endometrium shed like CAST OF ENDOMETRIAL CAVITY

TREATMENT

① NSAIDS

- IBUPROFEN
- NAPROXEN
- MEFENAMIC ACID

② Antispasmodics

- DICYCLOMIN
- DROTAVARINE
- HYOSCINE

③ combined Oral Contraceptives

④ Surgical Dilatation of cervix [Parous women has lesser spasmodic dysmenorrhea]

⑤ Pre Sacral Nerve ablation → Laser or thermal resectⁿ of Hypogastric plexus

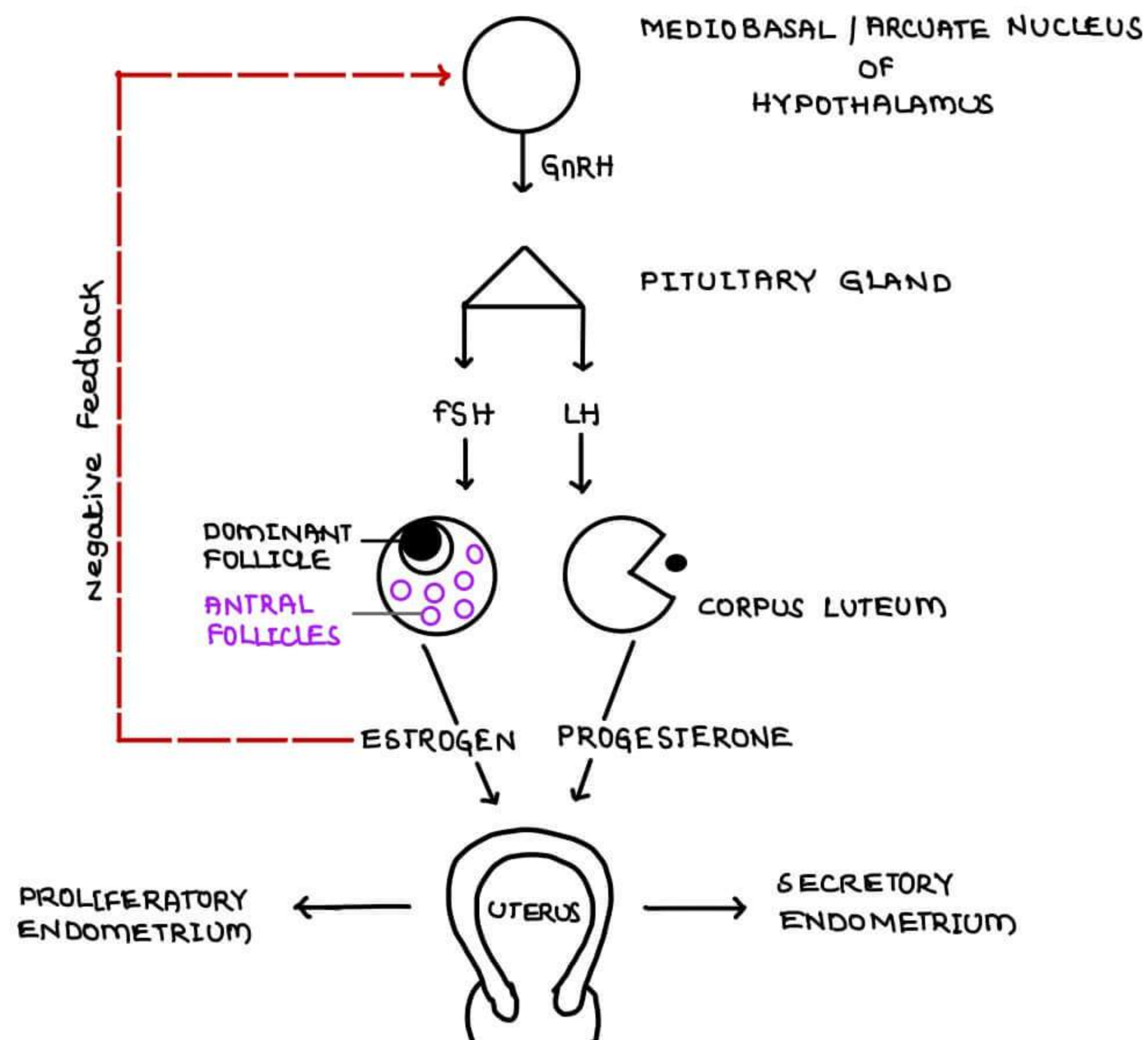
⑥ GnRH Analogues → will stop the periods

BASIC DEFINITIONS OF MENSTRUAL CYCLE

- Length of menstrual cycle → 28 ± 7 Days
- Polymenorrhea → < 21 Days
- oligomenorrhea → > 35 Days
- Duration → 2-7 Days
- Hypomenorrhea → < 2 days
- Menorrhagia → > 7 days
- Amount → 30-50 ml per cycle
- Excessive blood loss → > 80 ml [menorrhagia]
- POLYMENORRHAGIA → < 21 days & > 80 ml of blood loss

- METORRHAGIA → Irregular cycles superimposed on Regular cycles
 - Intermenstrual bleeding [Spotting]
- MENOMETORRHAGIA → Irregular acyclical bleeding
- METEOPATHIA HEMORRHAGICA
 - Prolonged amenorrhea followed by heavy withdrawal
 - amenorrhea → 2 1/2 - 3 months
 - in a women > 40 yrs
 - Anovulatory cycle, irregular
 - Hyperplasia of endometrial glands ⊕nt
 - Non Secretory Endometrium
 - Diagnosed by curettage & microscopic Examinatⁿ
 - cystic glandular Hyperplasia [SWISS CHEESE ENDOMETRIUM]
 - very less stroma
 - self limited condition
 - curettage is also curative

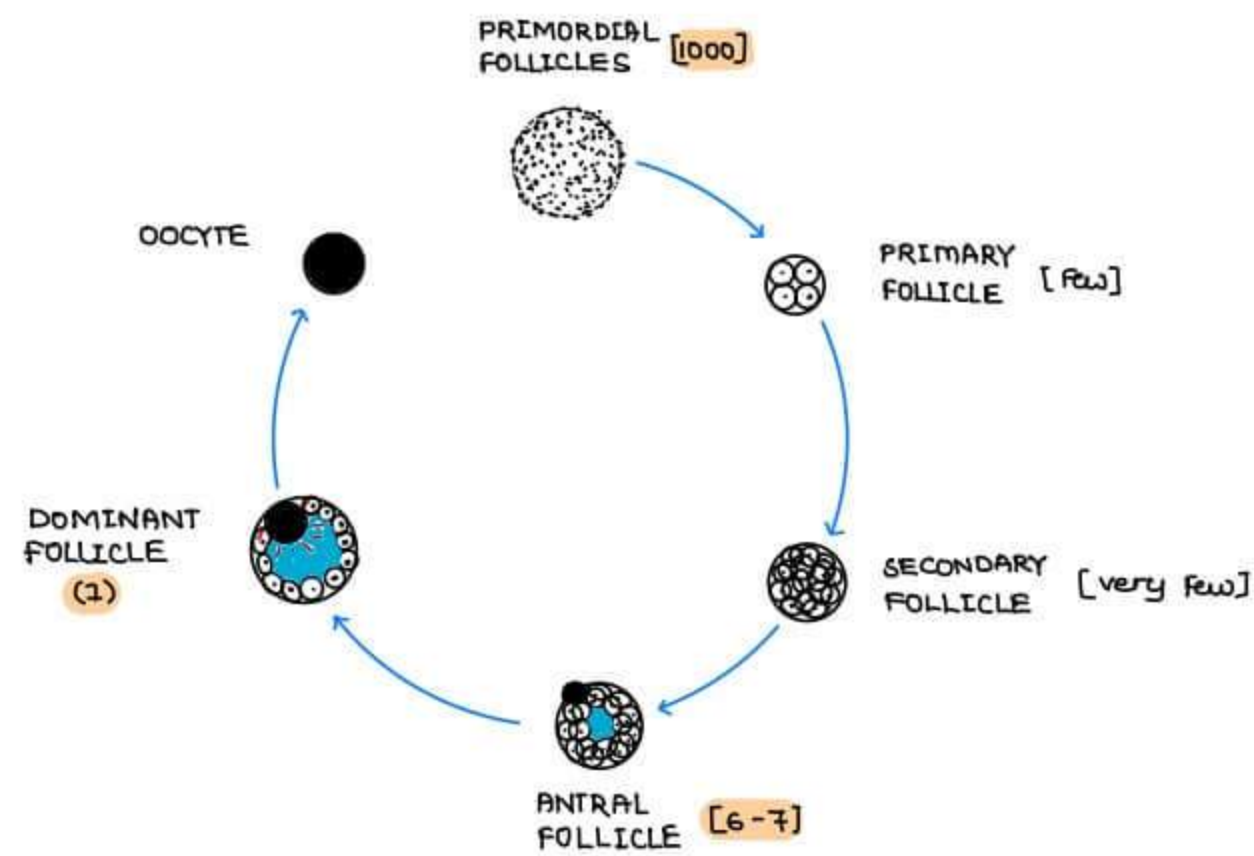
PHYSIOLOGY



- GnRH Releases in pulsatile fashion
 - 60 minutes in follicular phase [Faster [60min] in follicular phase]
 - 90 minutes in Luteal Phase [Longer [90min] in Luteal phase]
- GRANULOSA CELL OF FOLLICLE
 - sex cord cells
 - produce estrogen

→ ANTRAL FOLLICLES

- Fluid Filled follicles
- 6-7 made every month



→ Perimenopausal women have irregular cycles due to old follicles
 Fate of reproductⁿ during perimenopausal period

1. Anovulatory cycle
2. poor oocytes
3. No fertilizatⁿ
4. Poor embryos
5. Abortⁿ [40% after 40 years]

→ >35yrs Pregnancies → ELDERLY GRAVIDAS

indicated for

- Level II Scanning
- Triple markers, dual markers
- Amniocentesis

OVARIAN RESERVE

QUANTIFICATION

- | | OVARIAN RESERVE |
|---|-----------------|
| ① ↓ ANTRAL FOLLICULAR COUNT [young - 6 to 7, older - 1] | → ↓ |
| ② ↓ OVARIAN VOLUME [young - 3.5 x 2.5 x 3cm, older - 1 x 1.5 x 1cm] | → ↓ |
| ③ ↑ AGE | → ↓ |
| ④ ↓ ESTROGEN | → ↓ |
| ⑤ ↑ FSH → [younger - 2 to 6 IU, older - >15 IU] | → ↓ |
| ⑥ ↓ ANTI MULLERIAN HORMONE → made from granulosa cells of ovary | → ↓ |

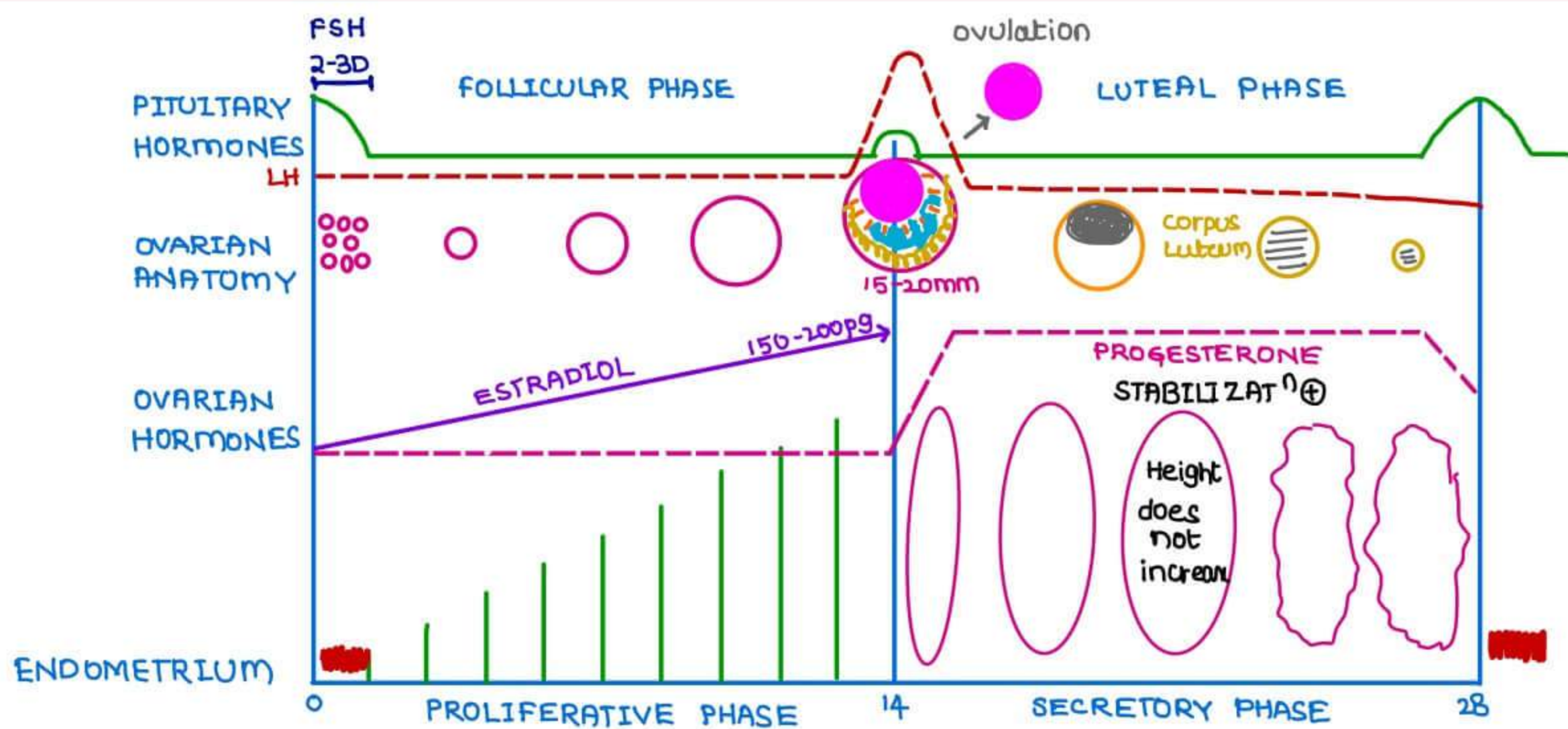
Purpose of FSH → Estrogen Productⁿ

Purpose of LH → Progesteron Productⁿ

GOOD INDICATORS OF OVARIAN RESERVE

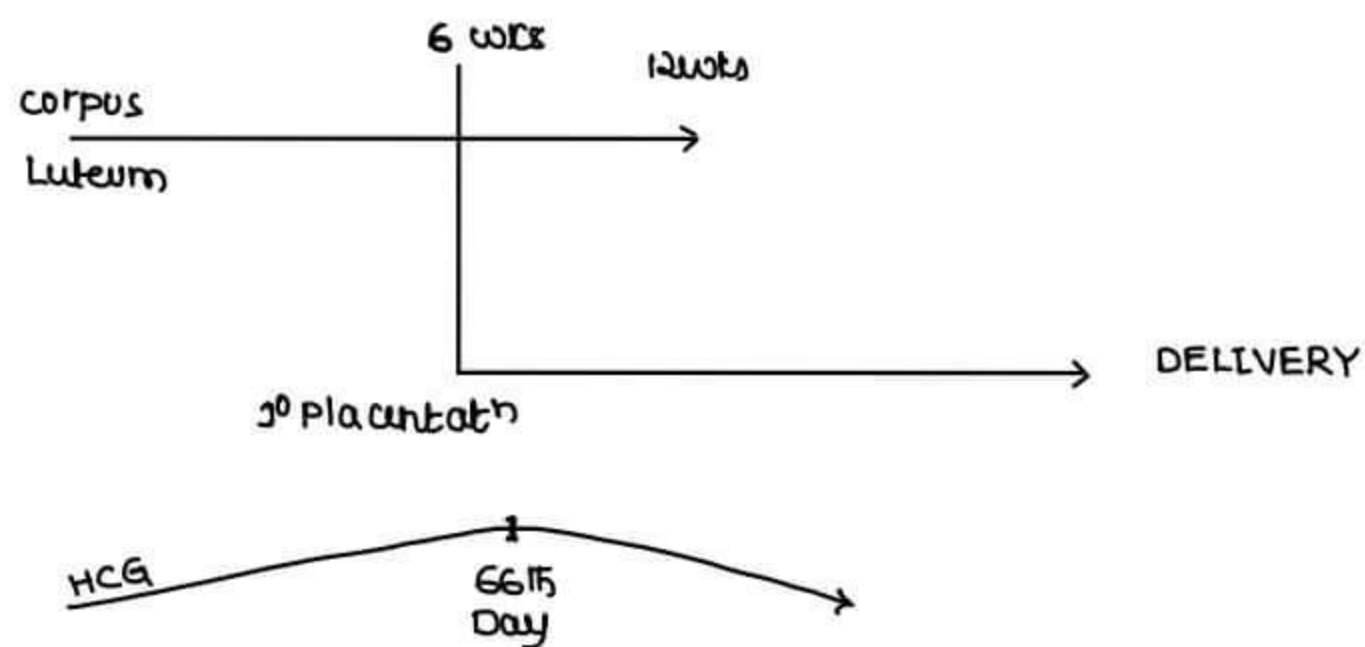
- AFC
- FSH
- AMH [single best for assessment]

- (N) FSH → 2-6 IU
- >10 IU → Suggestive of Menopausal women
- >40 IU → Diagnostic of Menopause



MAINTAINANCE OF PREGNANCY

- Exclusively maintained by CORPUS LUTEUM upto 6 WKS
 - corpus luteum remains upto 12 WKS in pregnancy
- By corpus luteum & placenta → from 6-12 weeks
- only by placenta → after 12 weeks
- Luteo-Placental shift occurs at 6 WKS



- Hyperemesis is maximum at 66th day [9 Weeks + 3 days]
- Abortⁿ can be R_y by → Progesterones
HCG
- **SPINBARKIET STRECHABILITY** [cervical mucus stretchability] [max. at 14th day]

↓
on drying
↓

FERNING / ARBORISING PATTERN [Nad crystals]

- **FERTILE PERIOD** → 11th to 16th day
 - Life span of sperm → 72 hrs
 - Life span of Ovum → 24-48 hrs

- CASE**
- On 24th day of cycle
 - Cervical mucus is thick } fertilizatⁿ
 - No oocyte } doesn't occur
 - SAFE PERIOD → Before 11th day & after 16th day

BILLING METHOD

- Natural method of contraceptⁿ
- Based on cervical mucus physiology

PROGESTERONE ONLY PILLS [POP]

Mechanism of Action

- G₁ mucus on 14th day → thick & viscid
- Anovulation [No oocyte]
- Unfavourable for implantation → Hypersecretory Endometrium
[OUT OF PHASE ENDOMETRIUM - Pinopods are internalized]
- Failure Rate → 1 to 2%
- 1st line hormonal management of abnormal uterine bleeding → PROGESTERONE
- stabilizes endometrium in a physiological way
- Next line of management → ESTROGEN
- First line of Drug in Acute SEVERE Menorrhagia → ESTROGEN

IVF

- CONTROLLED OVARIAN HYPERSTIMULATION
 - Give FSH injections [multiple] from beginning of the cycle, many follicles will be recruited
- On 14th day, under General Anesthesia & take all oocytes from the follicles with the help of TVS
- Take few of best oocytes & put them into test tube
- Fertilize with sperm in test tube → Embryo formed
- Put the Embryo back in the uterus
- Excess embryos are stored in liquid N₂ [-196°C] [FROZEN EMBRYO TRANSFER]
- 1st IVF Baby → LOUISE BROWN [1978]
- 1st IVF done by → STEPTOE & EDWARDS
- In 2010, Noble prize given to EDWARDS

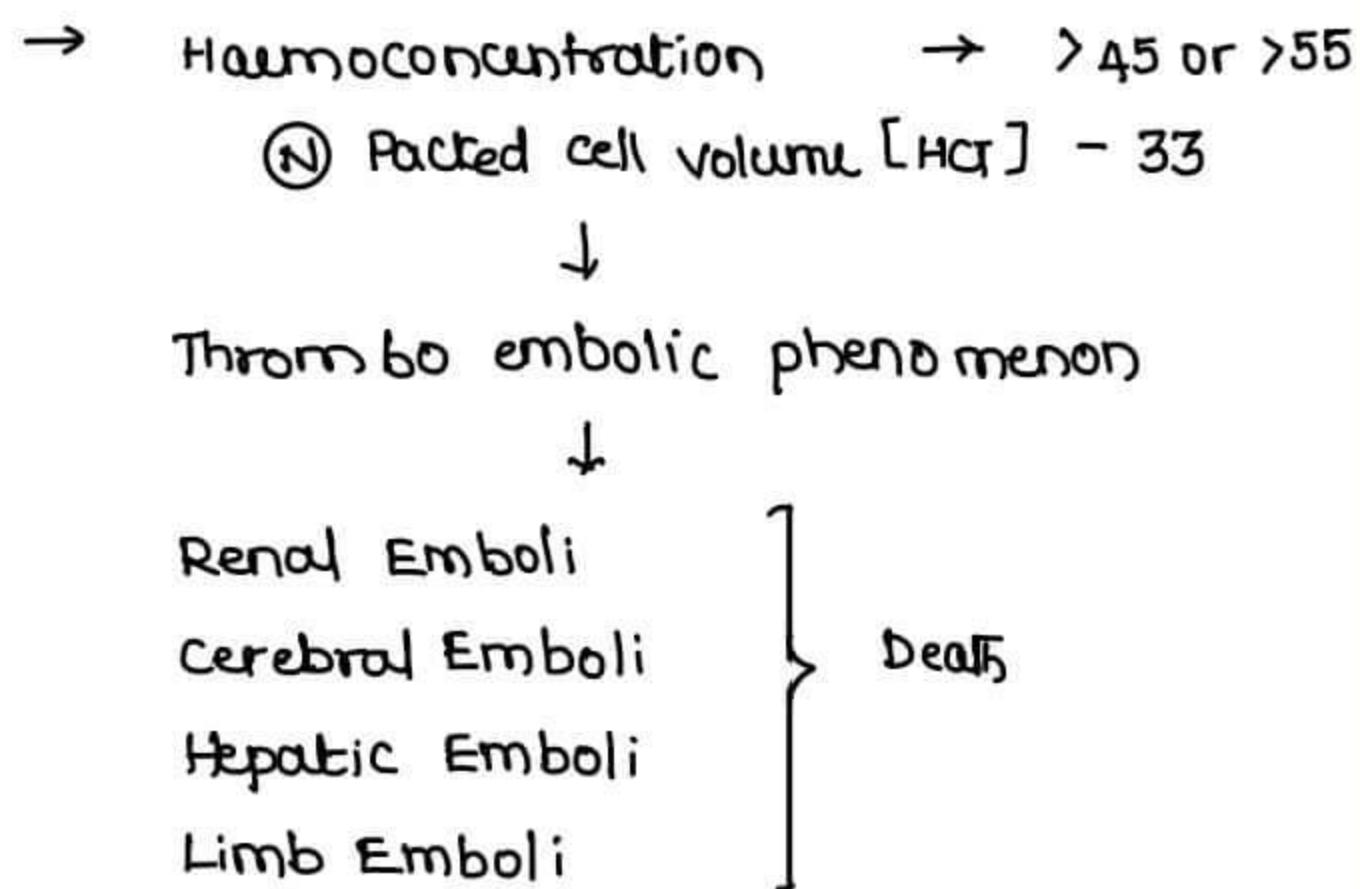
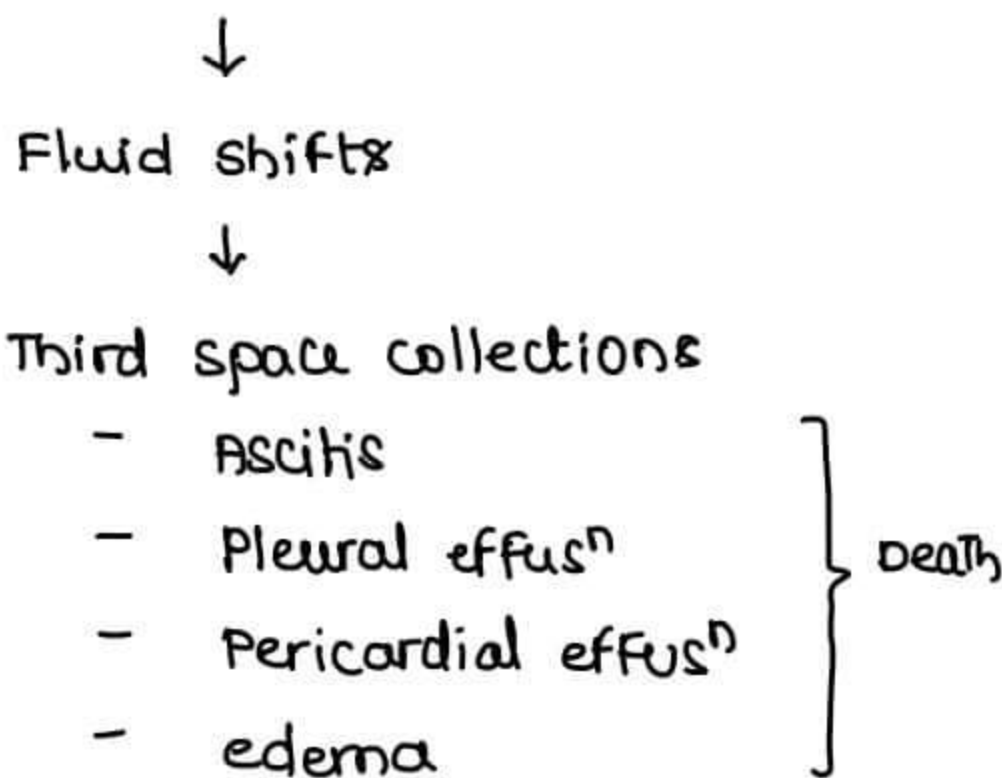
OVARIAN HYPERSTIMULATION SYNDROME

CONTROLLED OVARIAN HYPERSTIMULATION

- 200x15 eggs → 3000 pg of Estradiol
- 200x40 eggs → 8000 pg of Estradiol

- > 3500 pg of Estradiol leads to
 - Vascular Endothelial Growth factor
 - Renin, Pro renin
 - Angiotensin
- } ↑ VASCULAR PERMEABILITY

↑ VASCULAR PERMEABILITY



- Torsion
 - Rupture of ovary
 - Haemorrhage
- } Death

→ COH may lead to OVARIAN HYPERSTIMULATION SYNDROME

OVARIAN HYPERSTIMULATION SYNDROME

PRE DISPOSING FACTORS

- 9ng HCG [Initiating factor] [used for rupturing the follicle]
- Vascular Endothelial Growth factor
- Renin, Pro renin
- Angiotensin

MATHUR CLASSIFICATION

- MILD < 8cm NO Ascitis
- MODERATE 8-12 USG Ascitis
- SEVERE > 12cm Clinical Ascitis HCT → > 45
- CRITICAL Tense Ascitis HCT → > 55

→ No pregnancy is advised in severe & critical OHSS

→ Frozen embryos are transferred on 6th day of ovulatⁿ

MANAGEMENT

1 Rx OF OHSS

- Avoid pregnancy in severe & critical forms
- Remove fluids → Tap Ascites & effusion
- Give Oral fluids [mild, moderate forms]
 - IVF → NaCl, DNS [crystalloids]
 - Albumin, Dextran, Starch [colloids]

→ mcl_y → 13-15% of Pts on **CLOMIPHENE CITRATE**

Severe forms → **GONADOTROPINS**

- 9ng HMG [Human menopausal Gonadotropins]
- 9ng FSH Recombinant

→ **COMBINED ORAL CONTRACEPTIVE PILLS**

→ Tab Estradiol + Tab. Progesterone

→ Painless 'Regular' anovulatory cycles

→ Tab ESTRADIOL & Tab. PROGESTERONE are responsible for menses

ARTIFICIAL PERIODS

→ ETHINYLESTRADIOL → 0.03mg → 30µg

→ **ADVANTAGES OF COCPs**

- ↓ Bleeding
- ↓ Anemia
- ↓ Ca Endometrium
- ↓ Ca Ovary
- ↓ Ca colon
- ↓ Fibroids
- ↓ Benign Breast Disease
- ↓ Ovarian cysts
- ↓ PID

→ **DISADVANTAGES OF COCPs**

- ↑ Ca cervix [Adeno carcinoma type]
- ↑ Chlamydia PID [quite / Indolent]
- ↑ Gallstones

→ NO EFFECT on incidence on CA BREAST

→ ↑ GALL STONES → GALL BLADDER CANCER ???

- COCP causes smooth type of gall stones [Not predisposed for CA]
- Gall bladder cancer is caused by mixed & pigment gall stones

→ HEPATIC ADENOMA caused by COCPs
HEPATOCELLULAR CARCINOMA is not caused by COCPs

→ Generally COCPs are started on the 1st day of menstrual cycle
can be started at any time of menstrual cycle → QUICK START

→ **CONTRA INDICATIONS**

Breast feeding

Post Partum

Uncontrolled HTN [>160/100]

Active Breast cancer

Uncontrolled Diabetes mellitus

Severe cirrhosis

Active hepatitis

on Anticonvulsants

Hyperlipidemia

Earlier DVT

Earlier Pulmonary embolism

TESTS OF OVULATION

- ① BBT → ↑ 0.5°F
- ② Sr LH → > 15 IU
- ③ Sr Progesterone on day 21 [$>3\text{ng/ml}$]
- ④ Serial USG → follicular monitoring [OPD - usual]
- ⑤ Premenstrual Endometrial Biopsy on day 21
 - to check secretory changes
 - When the difference blw observed & expected changes is ≥ 2 days
→ LUTEAL PHASE DEFECTS
- ⑥ CERVICAL MUCUS STUDIES
 - Spinnbarkeit & ferning is dit estrogen
 - Serial cervical mucus studies
 - LOSS OF SPINBARKIET & FERNING → OVULATION
- ⑦ DIAGNOSTIC LAPAROSCOPY

ETIOLOGY**RETROGRADE MENSTRUATION**

- Proposed by SAMPSONS [SAMPSONS IMPLANTATION THEORY]
- 70-80% of all women have retrograde menses
- among them 5-10% of all women have poor immunity & ↑ estrogenicity & develop Endometriosis

AGE OF PRESENTATION → 3rd to 4th decade [25 - 35 yrs of age]

DIAGNOSIS

- ↑ CA125
- USG, MRI
- Laparoscopy [Best]

SITES OF PREDILECTION

- mc site → Ovary
 - 2nd mc site → POD
 - Bowel
 - Lung [periodic hemoptysis]
 - Nose [periodic epistaxis]
 - Eyes [periodic subconjunctival Hemorrhage]
- } VICARIOUS MENSTRUATION

PATHOLOGY

- POWDER BURN LESIONS / BLUE SPOTS
- CHOCOLATE CYST OF OVARY
- Scarring & Adhesions in fallopian tube → INFERTILITY

SYMPTOMS

- Chronic pain
- Acute monthly exacerbation → Severe congestive dysmenorrhea
- Deep dyspareunia
- Menorrhagia
- Infertility [dit altered tubo ovarian relatⁿ by adhesions]
 - ↓↓ intercourse
 - Poor ovulation
 - EMBRYOTOXIC ENDOMETRIOTIC DEPOSITS
 - ↳ poor quality embryos
 - ↳ ↓ implantation
 - ↳ ↑ abortion

TREATMENT**SURGICAL Rx**

- ADHESIDOLYSIS for adhesⁿ
- CYSTECTOMY for chocolate cysts
- ABLATⁿ for deposits → FULGRATION OF DEPOSITS
 - Thermal or laser

→ 60 - 70% RECURRENCE

① Inj Depo Medroxy Progesterone Acetate 150mg once in 3 months
 → creates Pseudo pregnancy state
 → Atrophy of endometrium in 3-4 months of Rx

② Tab Danazol

→ Androgen → Anti estrogenic action
 → Faster atrophy
 → S/E → Hirsutism
 virilizatⁿ

↳ Breast atrophy } Irreversible
 ↳ Hoarseness of voice }
 ↳ Clitoromegaly }

→ 1st sign to stop Rx is Danazol → Hoarseness of voice

③ Combined oral contraceptive Pills

→ Anovulatory cycles → Painless
 → Limits endometriosis

④ GnRH ANALOGUES → DEPOT OR CONTINUOUS FORM

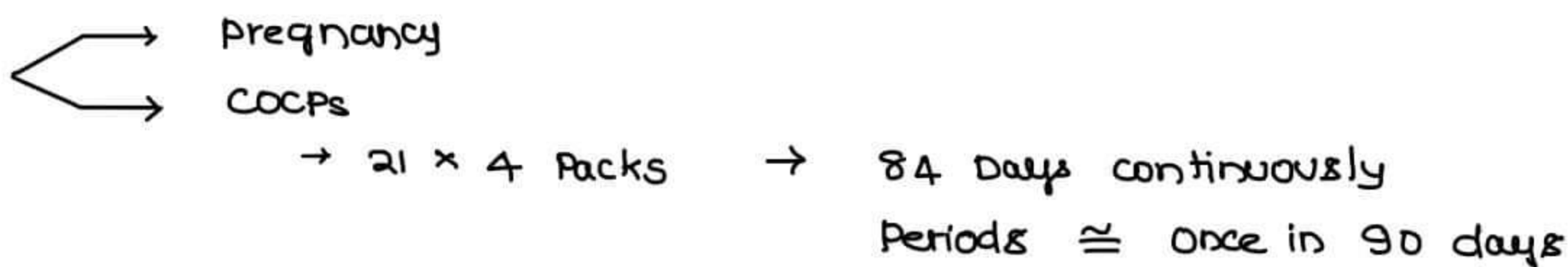
→ LEUPROLIN
 NAFERELIN
 GOSERLIN

→ down regulatⁿ / desensitizatⁿ of pituitary Receptors
 → Atrophy of endometrium

MEDICAL MANAGEMENT AIMS AT STOPPING THE PERIODS

Q 25yrs is chocolate cyst. Sx Rx done → what next → Medical Management

A Medical Management till conception



→ GnRH Analogues

→ > 6 months → Estrogen dependent osteoblastic actⁿ will stop } OSTEO
 → Estrogen independent osteoclastic actⁿ will continue } POROSIS

→ ADD BACK REGIME

Low dose Estrogens

RALOXIFENE [selective Estrogen Receptor Modulator]

SEEN IN

- multiparous women
- > 40 yrs
- 30% of hysterectomy specimens

ENDOMETRIOSIS INTERNA → Endometriosis within uterus

ASSOCIATED WITH

- Menorrhagia
- Progressive dysmenorrhea
- Infertility in young women [Rare]

UTERUS → uniformly enlarged & \leq 14 weeks size of pregnant uterus [14cm]

DIAGNOSIS

1. USG, MRI

- Sub endometrial halo ⊕
- Hetero echoic deposits in uterine myometrium
- ill defined hypoechoic areas → LAKES OF ENDOMETRIAL BLOOD
- Junctional zone b/w Endometrium & myometrium
 - ↳ Normal → 5-8 mm
 - ↳ Adenomyosis → > 12 mm [diagnostic]

2. UTERINE BIOPSY | POST HYSTERECTOMY UTERINE ANALYSIS

- ENDOMETRIAL GLANDS in uterine muscles → Pathognomonic
- DIFFUSE LOCALIZED ADENOMYOSIS

TREATMENT

- | | |
|-------------------------------|--|
| 1. Menorrhagia | → NSAIDs, Hormones |
| 2. Young women | → Hormones
COCPs for longer duration
IUCD's \downarrow progesterone [Mirena]
Localized excision |
| 3. Surgical Mx of Menorrhagia | → D & C |
| 4. Overall Best Rx | → Hysterectomy |

HORMONAL REPLACEMENT THERAPY

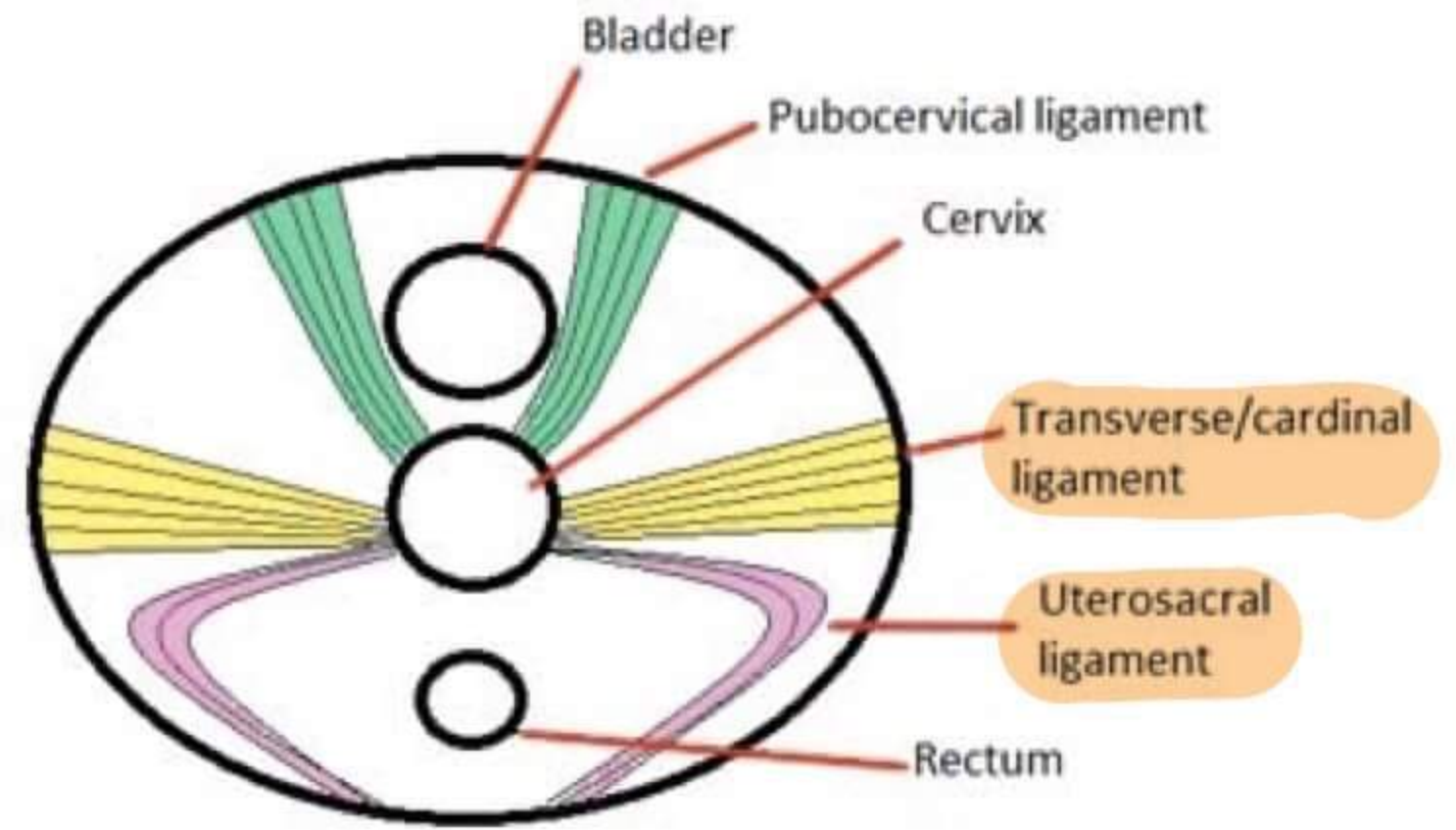
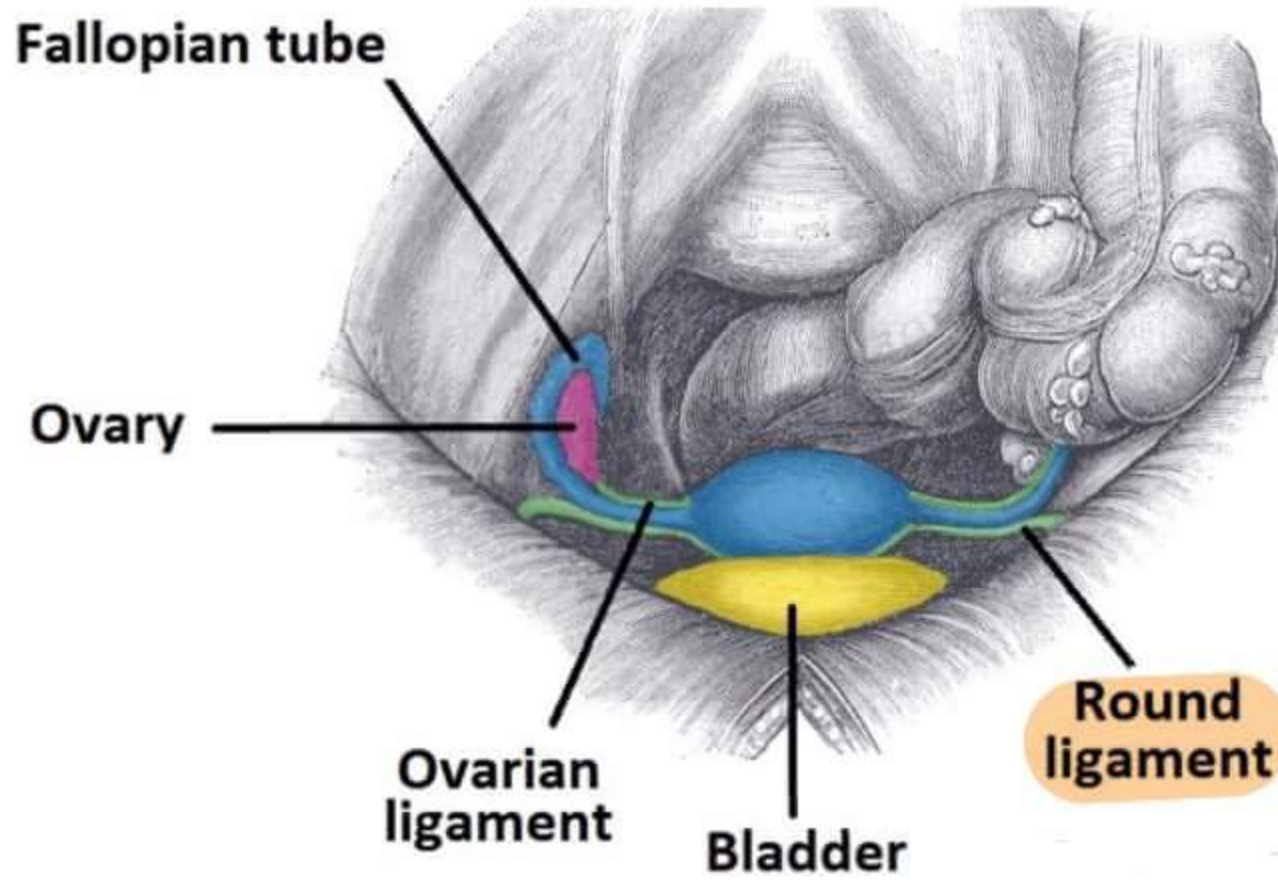
EFFECTS OF ESTROGENS

- 1 SKIN → SIC collagen ↓ → Lax - Loose skin
 - 2 HAIR → ↓ vellous hair → soft thin & light in color
 → ↑ Terminal hair → Hard, thick & Dark in color
 - 3 VOICE → Hoarsness of voice
 - 4 BONES → ↑ fractures
 - vertebral compression fractures [mc]
 - wrist fractures
 - femur fractures
 - 5 BRAIN → mood swings
 - Depression
 - Anger threshold ↓
 - Anxiety
 → Insomnia
 → Hot flushes [coincides i LH Fluxh]
 - 6 HEART → coronary Artery Diseases ↑
 - 7 PELVIS → ↑ fractures

 → (N) PH of vagina → Acidic
 - Glycogen $\xrightarrow{\text{Lactobacillus}}$ monosaccharides
- ↑ Anaerobes
- ESTROGENS → pH → Alkaline → ↓ Lactobacillus → ↑ Infections
- vaginitis
 - Vulvitis
 - Urethritis
 - PID [Pelvic Inflammatory Diseases]
- Dry vagina → ↓ Intercourse
- Pelvic Organ Prolapse
 - Abnormal conduct of labour is the main reason

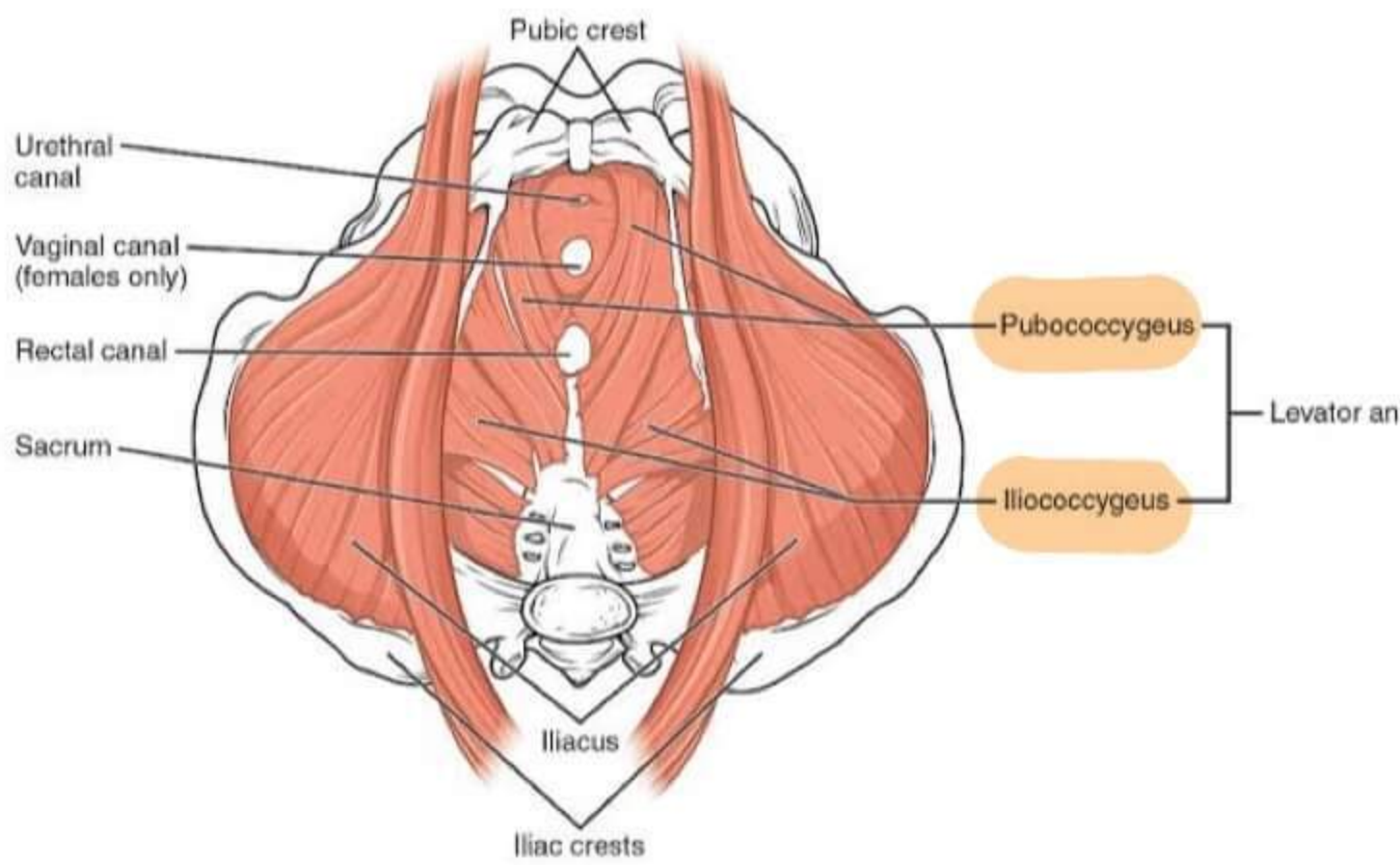
SUPPORTS OF UTERUS

LIGAMENT SUPPORT

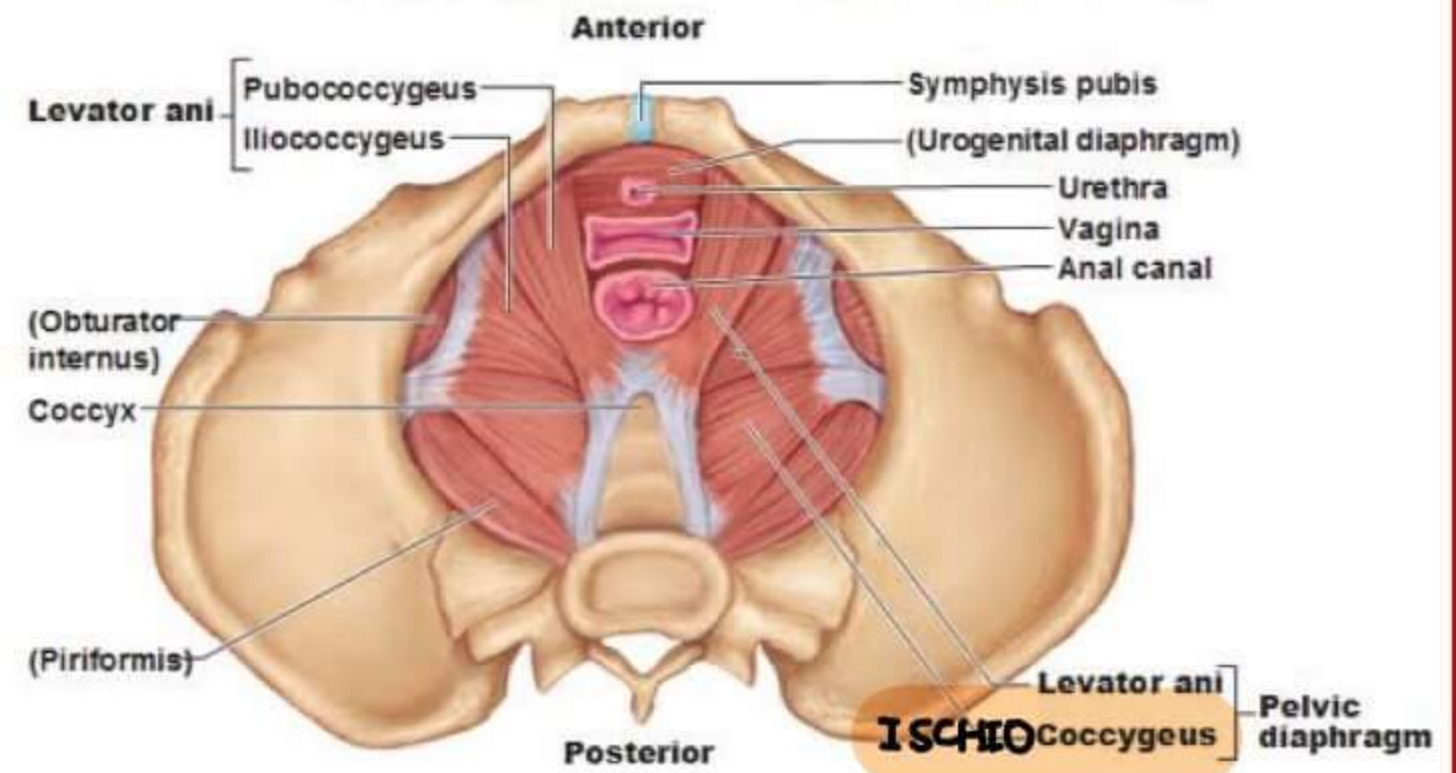


TRANSVERSE | CARDINAL LIGAMENT | MACKENRODT'S LIGAMENT → most important among Ligaments

MUSCULAR SUPPORT



The Pelvic Diaphragm = the deepest muscle layer



INVESTIGATIONS

- CBC
- mammography
- Pap Smear
- USG → Endometrium → ≤ 4mm
- LFT [Liver functⁿ Tests]
- F/PP Sugar&
- Lipid Profile
- Serum FSH → to diagnose menopause
to monitor HRT [if given to younger women (Premature ovarian failure)]
- ECG

HORMONE REPLACEMENT THERAPY

- | | | |
|-----------------------------------|------------------------|-----------------------|
| ① Tab ESTRADIOL | 1-2 mg / Day | } Add
Progesterone |
| ② Tab CONJUGATED EQUINE ESTROGENS | 0.625 to 1.25 mg / Day | |
| ③ Tab TIBOLONE | | |
- Synthetic estrogen
 - Progestational metabolite + nt
 - 2.5 mg / Day

④ SERS [selective Estrogen Receptor Modulators]

RALOXIFENE

- 60 mg / Day
- Estrogenic on bone
- Anti estrogenic on brain [CI for hot flashes]

⑤ PLANT ESTROGENS

- Safer
- ↓ Effective

⑥ BISPHOSPHONATES

- non hormonal Rx of osteoporosis
- ALENDRONATE Daily
- RISEDRONATE Weekly
- IBANDRONATE Monthly

⑦ CALCITONIN

- ↓ Osteoclastic Action

PARATHORMONE EXTRACT

TERIPARATIDE

Induces new bone formatⁿ

CONTRA INDICATIONS

- undiagnosed vaginal bleeding
- H/O Breast cancer
- H/O Endometrial cancer
- Liver Dysfunctⁿ
- Thrombo embolic Diseases
- Endometriosis
- Fibroids
- Porphyrias

Rx OF HOT FLUSHES

- DOC → ESTROGENS
Takes 20-25 Days to act
- CLONIDINE HYDRO CHLORIDE
Acute Relief
100µg OD/BD
↓ vasomotor flushing
- ALPRAZOLAM
0.25 mg
For Acute Relief
- SSRI [Selective Serotonin Reuptake Inhibitors]
FLUOXETINE
Takes 6-7 Days

Coronary Artery Disease

- Estrogens are cardioprotective
- HRT IS NOT CARDIO PROTECTIVE
 - initial few years → cardioprotective
 - Long term → Detrimental to heart
- Local Estrogens are better

ENDOMETRIAL CARCINOMA

RISK FACTORS

- ↑ ESTROGENS
- HRT
- TAMOXIFEN
- Anovulatory conditions → PCOD
- Estrogen Producing Ovarian cancers → Granulosa cell tumor
- Early menarche
- Late menopause
- Abnormal Liver Functⁿ Tests
- Obesity → Fats $\left\{ \begin{array}{l} \text{Androgens} \\ \downarrow \\ \text{Aromatase} \\ \downarrow \\ \text{Estrogens} \end{array} \right\}$

- corpus cancer syndrome
DM - HTN - Obesity

- Familial Predisposition *
ca Breast
ca Endometrium 1st degree female relatives can have either of
ca Ovary these

- Nulliparous women

- 80% of this Etiology associated \bar{c} CA Endometrium → TYPE 1
20% of this etiology NO association → TYPE 2

→ **ETIOLOGY** → HYPERPLASIAS → CANCER

→ Age group → 45-55 yrs

→ **HYPERPLASIAS** [Premalignant]

Simple Hyperplasia without atypia	→ 1%	} Give PROGESTERONE THERAPY
Complex Hyperplasia without atypia	→ 3%	
Simple Hyperplasia with atypia	→ 8%	} DO SIMPLE HYSTRECTOMY
Complex Hyperplasia with atypia	→ 29%	

SYMPTOMS

- Irregular Acyclical Bleeding [mc]
- Postmenopausal bleeding
- Pyometra → Dirty foul smelling vaginal Discharge

~~Loss of weight~~
~~Loss of appetite~~
~~CA cachexia~~
~~CA Pain~~ → Late presentation

HISTOPATHOLOGY

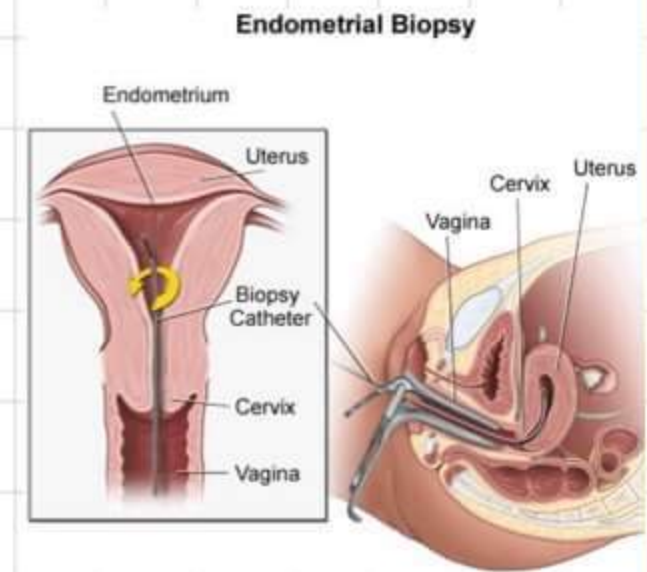
- Endometrioid Adenocarcinoma [mc] [80%]
- Papillary / villoglandular
- Squamous
- Secretory

DIAGNOSIS

→ 1st Management

PIPELLE ENDOMETRIAL BIOPSY [in OPD]

Paracervical block may be required in few cases
 90-95% sensitive
 Biopsy taken from anterior wall



→ **FRACTIONAL CURETTAGE [DNC]**

95-99% sensitive
 done in OT

→ **HYSTEROSCOPIC BIOPSY**

100% sensitive

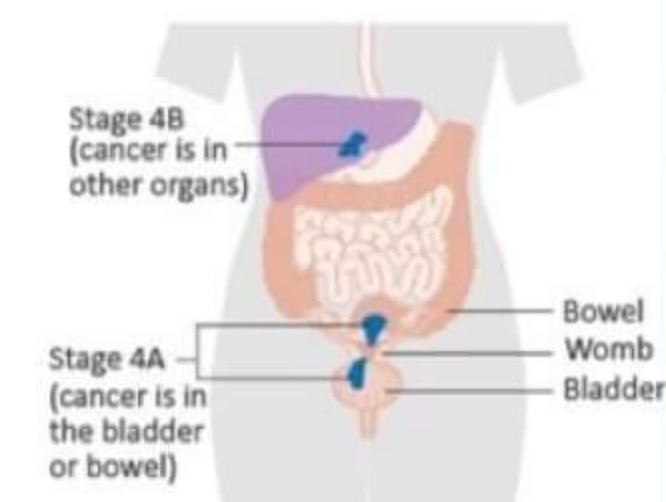
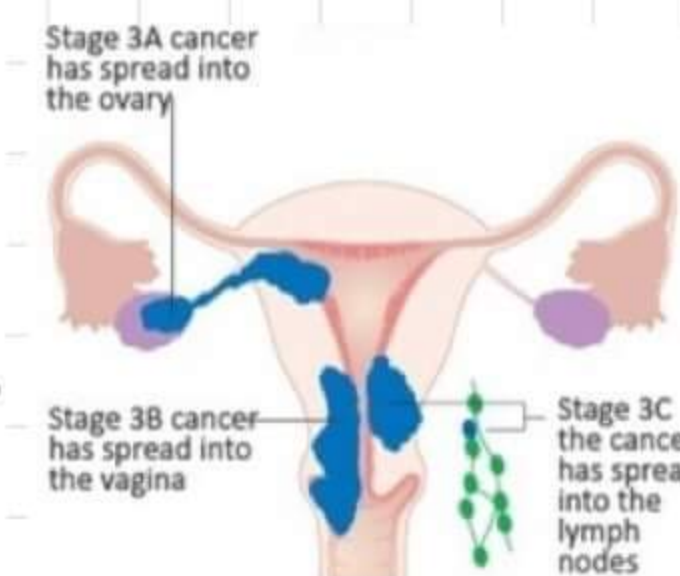
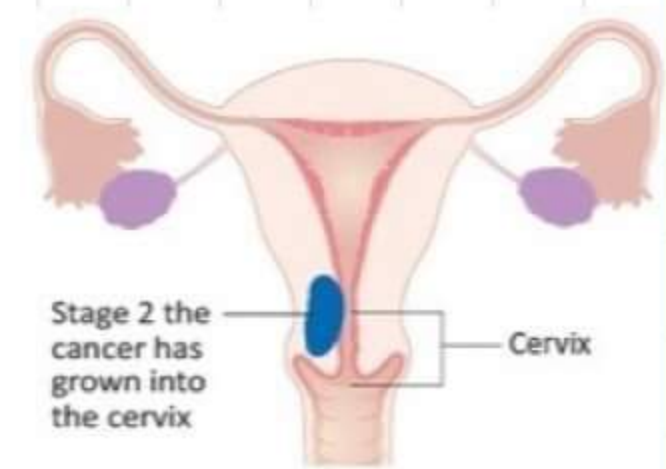
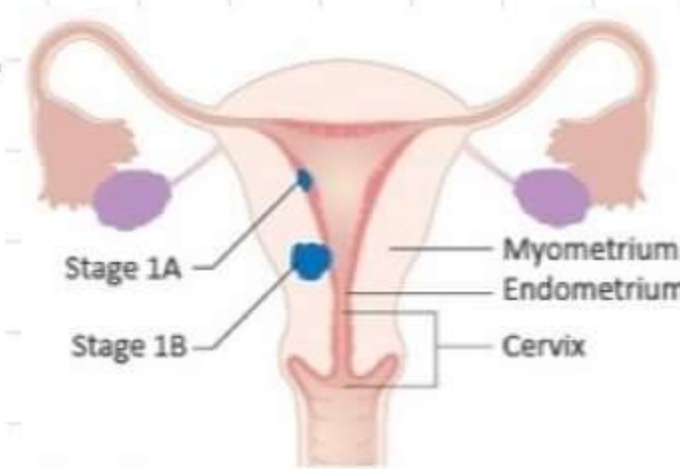
→ TVS is an helpful adjunctive procedure but not the best

→ E.T should be ≤ 4mm to be called normal

STAGING OF CA ENDOMETRIUM

Table 1: 2009 FIGO staging system for carcinoma of the endometrium

Stage I ^a	Tumor contained to the corpus uteri
IA	No or less than half myometrial invasion
IB	Invasion equal to or more than half of the myometrium
Stage II	Tumor invades the cervical stroma but does not extend beyond the uterus ^b
Stage III ^a	Local and/or regional spread of tumor ^c
IIIA	Tumor invades the serosa of the corpus uteri and/or adnexas
IIIB	Vaginal and/or parametrial involvement
IIIC	Metastases to pelvis and/or para-aortic lymph nodes
IIIC1	Positive pelvic nodes
IIIC2	Positive para-aortic lymph nodes with or without positive pelvic lymph nodes
Stage IV ^a	Tumor invades bladder and/or bowel mucosa and/or distant metastases
IVA	Tumor invasion of bladder and/or bowel mucosa
IVB	Distant metastases, including intra-abdominal metastases and or inguinal lymph nodes

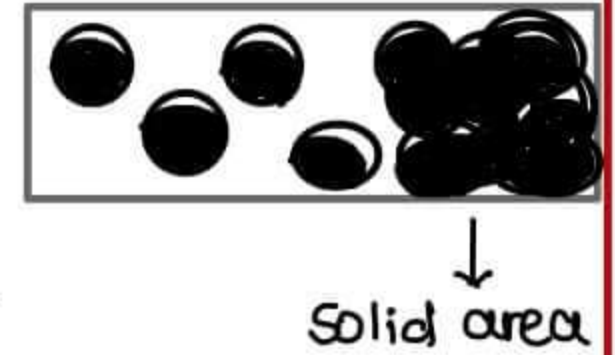


FIGO = International Federation of Gynecology and Obstetrics
^a Includes grades 1, 2, or 3
^b Endocervical glandular involvement only should be considered as stage I and no longer as stage II.
^c Positive cytology has to be reported separately without changing the stage.

All cancers in Gynecology staged surgically except CA cervix [clinical staging]

PROGNOSTIC FACTORS

- Hysterectomy → Staging
- Pelvic lymphadenectomy
- **Grading** → solid areas on histopathology slides
 - Grade I → <5% solid areas
 - Grade II → 5-50% solid areas
 - Grade III → >50% solid areas



Single best Prognostic marker → Staging > Grading

- Age
- Type
- Estrogen Receptor & Progesterone receptor status
- previous Rx taken

TREATMENT

- Hysterectomy is already Done
- **Stage I/II**
 - Grade I, myometrium < 1/2 involved → Nothing required
 - Grade II, myometrium > 1/2 involved → vaginal irradiatⁿ
 - Grade III → Pelvic irradiatⁿ
 - Adnexal or cervical involved → whole abdominal irradiatⁿ
- **Stage III/Stage IV**
 - Radiotherapy
 - Surgical Therapy
 - chemotherapy
 - Hormonal Therapy

} INDIVIDUALIZED
- **VAULT OF THE VAGINA**
 - Left over vagina after hysterectomy
 - 1st site of recurrence
 - 1st line mx of recurrence → HIGH PROGESTERONE [200-250 mg/day]
 - Preventⁿ of recurrence → VAGINAL IRRADIATION

POST MENOPAUSAL BLEEDING [>1yr of menopause]

- mcc in india → CA cervix
- mccause → CA cervix
- mcc in western hemisphere → Endometrial Atrophy [60-70%]
 - CA endometrium → 10%
 - Hyperplasia → 10%
 - Polyps → 10% - 12%
 - HRT → 30%

- post menopausal women → No Estrogens [No Immunity]
 ↑ vaginitis → Endometritis

Atrophic Endometrium

↓

Endometritis [senile Endometritis]

↓

Bleeding

OVARIAN TUMORS

- 3 x 3.5 x 2.5 cm
 - Almond shaped
 - Rough surface due to SCARS by ovulatⁿ
 - Nulliparous
 - Ovulation induction
 - Early menarche
 - Late menopause
 - Perineal talc
 - Asbestosis exposure
- } ↑ SCARS

ETIOLOGY

- ① Scars → Epithelium → Healing
 ↑ Scars → Epithelium → Over Healing → Epithelial ovarian CA

② Association

- BRCA 1 [on chromosome 17]
- BRCA 2 [on chromosome 13]

③ Familial Predisposition

- ② 1st degree Relatives & cancers → 35-40% chance of
- ① 1st degree Relative } 2 to 10 times chances
- ① 2nd degree Relative

- 70% of all ovarian cancers → Surface Epithelial ovarian cancers
- Age group → 6th, 7th decades
- mostly bilateral
- Associated ↑ CA 125
 - Significant values in a postmenopausal women → > 35
 - premenopausal women → > 200

CLINICAL FEATURES

- BIG Abdominal mass → mostly benign

DIAGNOSIS

- USG features of malignancy TVS > TAS
 - Bilateral
 - Surface irregularities
 - Cystic + solid areas together
 - Septated tumors - irregular, septate
 - Ascites + nt

TREATMENT

→ STAGING LAPAROTOMY + OPTIMAL DEBULKING

→ STEPS OF STAGING LAPAROTOMY

- ① Midline Incision / Paramedian incision
- ② Assess Pelvis, Abdominal Organs
- ③ Washings / Ascites → for cytology [malignant cells]
- ④ Infracolic omentectomy
- ⑤ Peritoneal Biopsies
- ⑥ Retroperitoneal lymph node sampling

→ OPTIMAL DEBULKING

→ < 1.5 cm is what maximum amount can be left

OVARIAN CANCER STAGING

STAGE I → OVARY INVOLVEMENT

IA → one ovary involved

IB → both ovaries involved

IC → A/B ±

C₁ → Surgical Spill

C₂ → Surface growth

C₃ → Malignant Ascites / washings

STAGE II → PELVIS INVOLVEMENT

IIA → uterus, fallopian tubes

IIB → other pelvic organs

STAGE III → ABDOMINAL VISCERAL INVOLVEMENT

IIIA₁ Retroperitoneal lymph node involvement

A₁(i) → < 10mm

A₁(ii) → > 10mm

IIIA₂ microscopic Abdominal involvement

IIIB macroscopic involvement < 2cm

IIIC macroscopic involvement > 2cm

} Superficial
Liver & Spleen
involvement

STAGE IV

IVA Malignant pleural Effusion

IVB Deep liver & spleen deposits

Inguinal lymphnode involvement

CHEMOTHERAPY → PLATINUM BASED

① Epithelial Ovarian Tumor

① Cyclophosphamide

Adriamycin

Platins $\left\{ \begin{array}{l} \rightarrow \text{cis} \\ \rightarrow \text{Carbo} \end{array} \right.$

② Platins } Better choice
Toxol }

② GERM CELL TUMORS

① VINCRISTINE

BLEOMYCIN

PLATINS

② BLEOMYCIN } Better choice
ETOPOSIDE }
PLATINS }

③ SEX CORD TUMORS

→ Surgery alone will suffice mostly

RADIOTHERAPY

- Normal ovary radiosensitive
- ovarian tumors radioresistant
- EXCEPTION → DYSGERMINOMA

EPITHELIAL OVARIAN TUMORS

- mc [75%]
- older age group
- Bilateral
- TYPES

① SEROUS CYSTADENOMA [mc type]

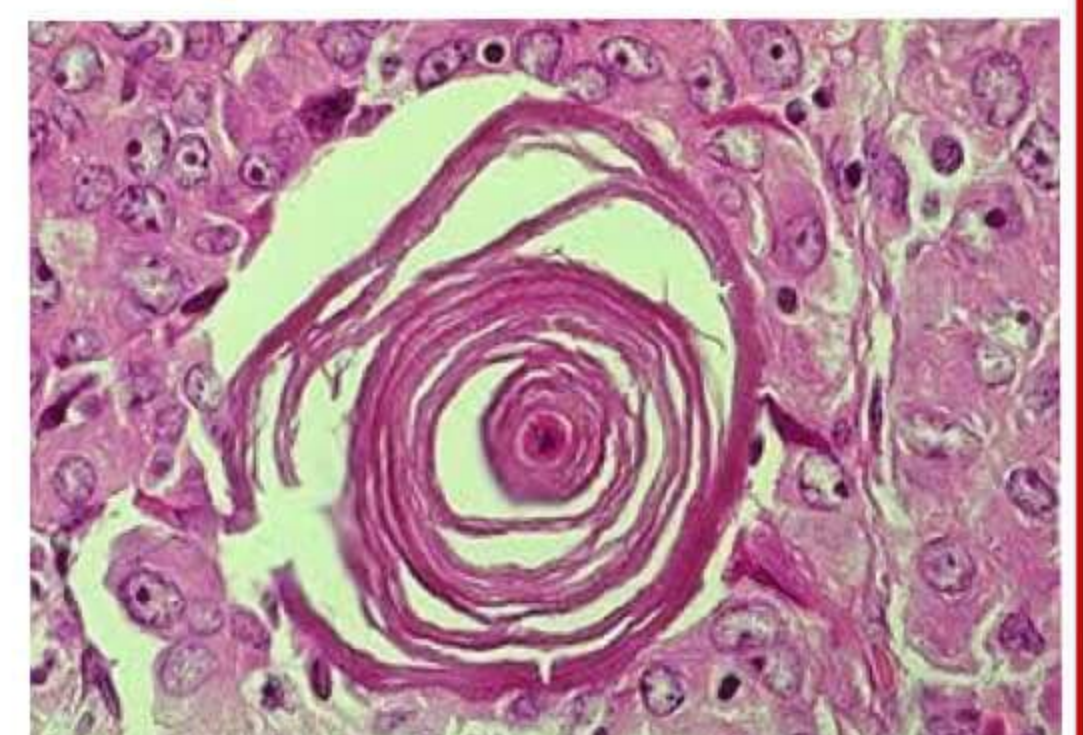
- uniloculated
- B/L in > 50%
- mostly malignant
- Surface growth + nt
- Psammoma Bodies + nt in 40-45%
- cells are like fallopian tube

② MUCINOUS CYSTADENOMA

- Less malignant
- B/L in 10%
- multilocular



SEROUS CYSTADENOMA



PSAMMOMA BODY

- Pseudomyxoma Peritonei → Severe hypoproteinemia
- mc cause in ovarian tumor → mucinous cystadenoma
- mc cause → Appendiceal cancer
- cells are like cervix

③ BRENNER TUMOR

- made of transitional cells
- NESTS → WALTHARD INCLUSIONS
- PUFFED WHEAT TYPE
- Benign
- Rubbery in consistency
- cells are like bladder
- associated ± post menopausal bleeding
- associated ± Pseudomeig Syndrome
 - Pseudomeig syndrome is mly dlt Brenner Tumor

MEIG SYNDROME
Fibroma Ovary
Ascites
Pleural effusion

④ ENDOMETROID TUMOR

- Endometrial type of collections
- 6-8% of epithelial ovarian tumors

GERM CELL TUMORS

- younger age group
- unilateral

① TERATOMAS [mc]

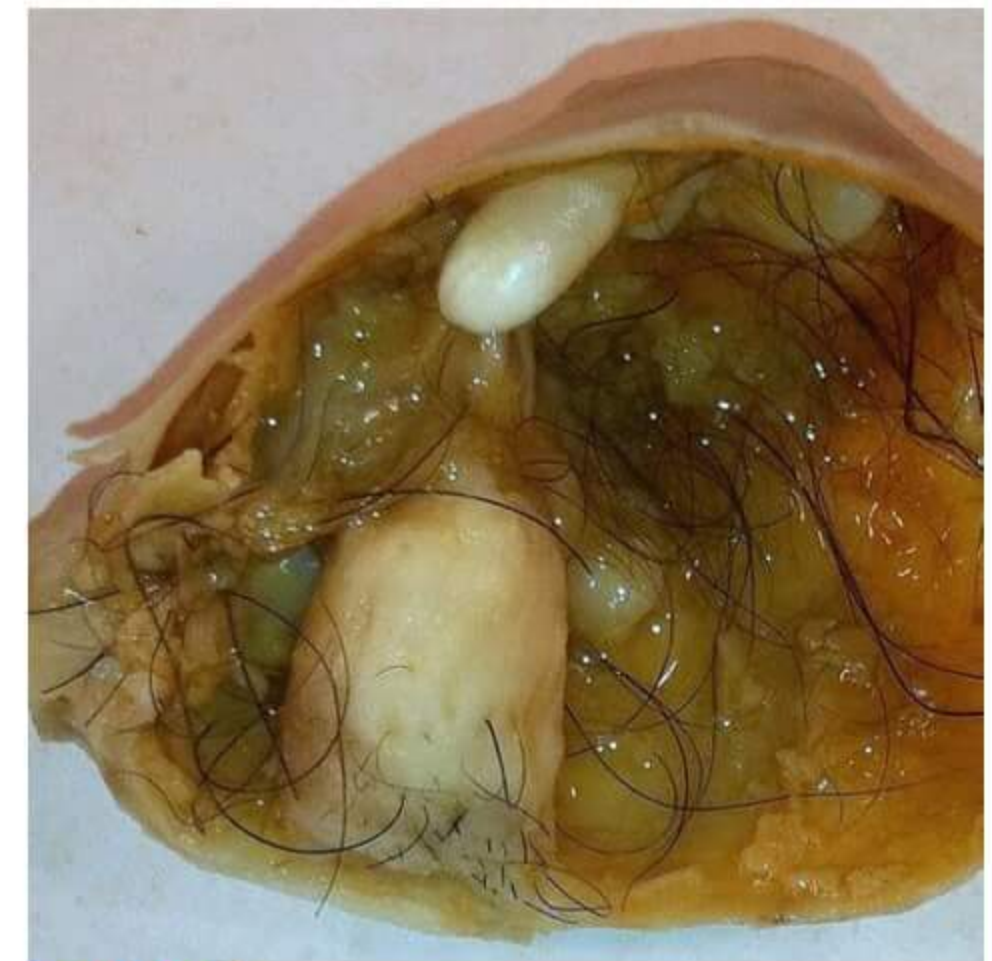
- Malignant [10% of teratomas]
- Dermoid / Benign cystic Teratoma [90% of teratomas]
 - All 3 germoid layers +nt

Endoderm	}	Bone, Teeth
Mesoderm		Sebaceous secretions
Ectoderm		Hair, Endocrine glands

- 10-15% are bilateral
- Dermoids can have malignant transformⁿ → Sq. cell carcinoma
- Dermoids are mc tumors of pregnancy
- Dermoids are mc tumors of torsion

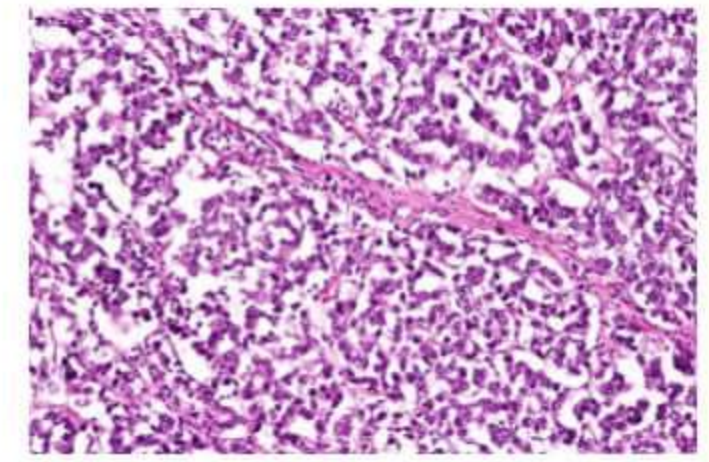
② DYSGERMINOMA

- mc germ cell malignancy [40-45%]
- only BIL germ cell malignancy
- associated ± Dysgermic gonads
- large fleshy tumor
- mostly malignant → Poor prognosis



DERMOID

- SEMINOMA TYPE CELLS
 - Large polygonal cells \bar{c}
 - clear cytoplasm & dark stained nuclei \bar{c}
 - back to back arrangement



- Associated \bar{c}
 - \uparrow LDH
 - \uparrow Placental Alkaline PO₄
 - Alpha feto protein → Not increased

③ YOLK SAC / ENDODERMAL SINUS TUMOR & EMBRYONAL TUMORS

COMMON FEATURES

- Young women & girls
- Poor Prognosis
- \uparrow Alpha feto protein

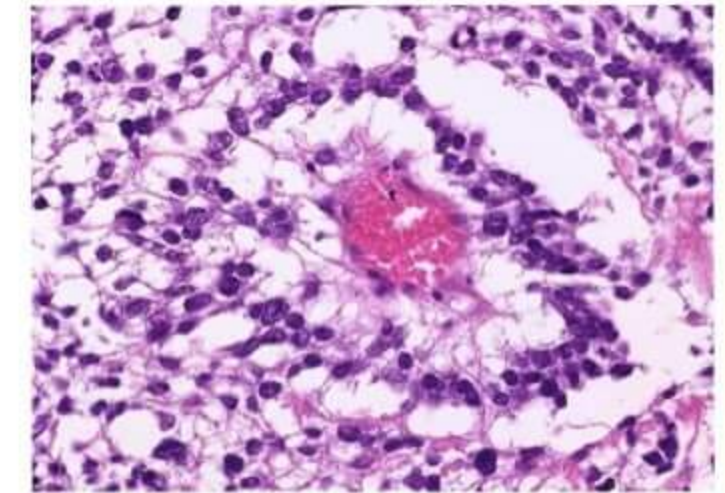
SPECIFIC FEATURES

YOLK SAC TUMOR

- α_1 anti trypsin
- SCHILLER DUVAL BODIES

EMBRYONAL TUMORS

- HCG



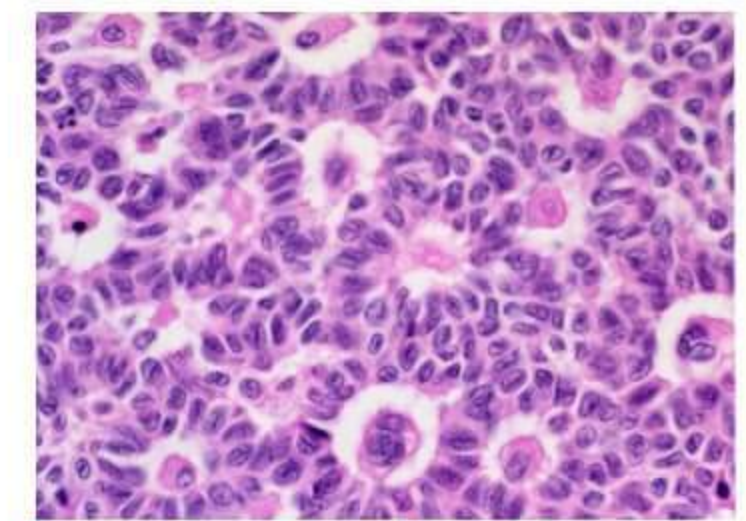
SCHILLER DUVAL BODY

SEX CORD TUMORS

① GRANULOSA CELL TUMORS [mc]

- \uparrow Estrogens
 - Precocious Puberty
 - Menorrhagia
 - Endometrial cancer

- Marker → Inhibin
- CARL EXNER BODIES
- contralateral ovarian secondaries prior to systemic deliveries



CARL EXNER BODIES

② SERTOLI LEYDIG TUMORS / ARRHENOBLASTOMAS

- Hirsutism → male pattern baldness
- virilization → Permanent changes
 - Hoarseness
 - Breast Atrophy
 - Clitoromegaly

- Oligomenorrhea to amenorrhea
- Benign
- Rapid onset **hirsutism**

HIRSUTISM	→ RAPID ONSET	→ Seen in ovarian or adrenal tumors
	PUBERTY ONSET	→ Seen in Congenital Adrenal Hyperplasia
	ADULT ONSET	→ seen in PCOS
	→ CAUSES	→ 25% → Idiopathic
		→ 75% → 2° [mc → PCOS]
	MC CAUSE OF HIRSUTISM	→ PCOS

NON NEOPLASTIC OVARIAN CYSTS

- FOLLICULAR CYST
- CORPUS LUTEAL CYST
- THECA LUTEIN CYST → dit ↑HCG → seen in Molar pregnancy, twin preg
- HEMORRHAGIC CYST
- Resolve by themselves → CONSERVATIVE MANAGEMENT

- ➔ mc ovarian tumor of pregnancy → Dermoid > Serous cyst
- IF it is small (<5cm) & asymptomatic → NO Rx required
- IF it is large (>10cm) & asymptomatic → Remove it in 2nd trimester
- IF diagnosed in 3rd trimester → Remove 6 wks after delivery
- IF doing a cesarean section → Remove at the time of C. sectⁿ

Secondary to ovary

mcly from CA stomach > CA Breast

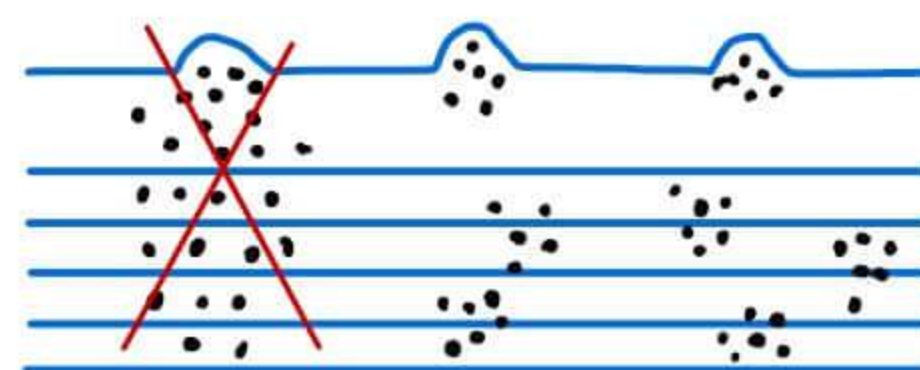
KRUKENBERG TUMOR

- Secondary of ovary from CA stomach
- Bilateral
- Firm to solid
- Signet Ring cells
- may have cystic degenerations
- ovary retains it's shape

BORDERLINE EPITHELIAL OVARIAN TUMORS

Features

- Epithelial hyperplasia
- mitotic activity +nt
- Nuclear atypia +nt
- detached cell clusters +nt
- No destructive stromal invasion



POLYCYSTIC OVARIAN SYNDROME

→ aka **STEIN LEVINTHAL SYNDROME**

HEADINGS

FEATURES

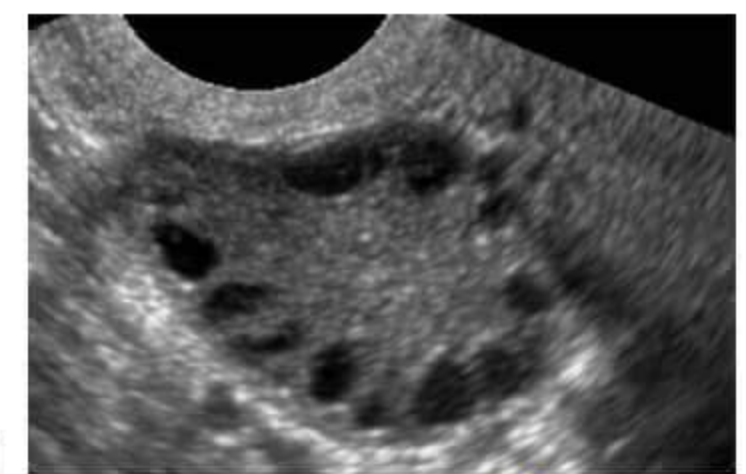
- Anovulation
- Hirsutism
- Obese
- oligomenorrhea
- Amenorrhea
- Infertility
- d/t Hyperandrogenism
- d/t insulin resistance

LAB PARAMETERS

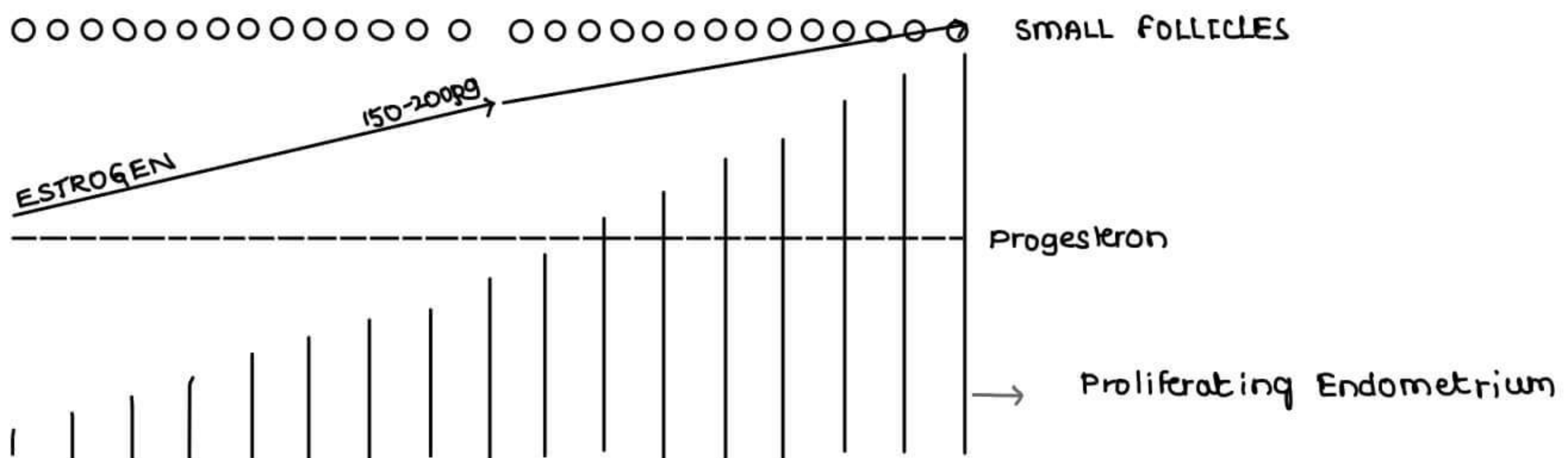
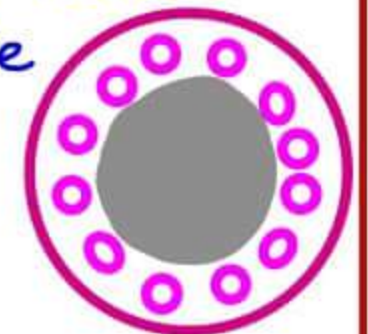
- LH : FSH
- Serum Testosterone
- Serum Androstenedione
- SHBG [Sex Hormone Binding Globulin]
- Serum Insulin

APPEARANCE → MISNOMER

- MULTIPLE SMALL FOLLICLES around the periphery of ovary
 - 2 - 6 mm [≤ 9 mm]
 - 10 - 12 per each ovary
- THICK STROMA
- ovary is 2-5 times larger than Normal



Ring of Pearl/
Necklace of Pearl
Appearance

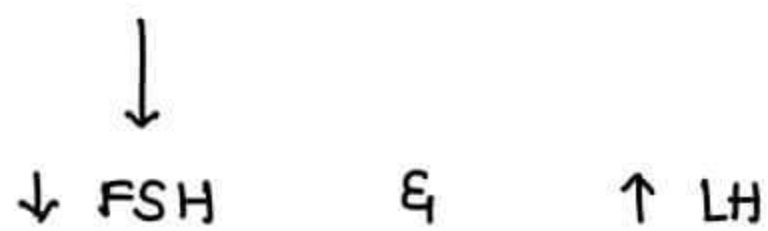


SHEDDING OF ENDOMETRIUM IS DUE TO ISCHEMIC WITHDRAWAL

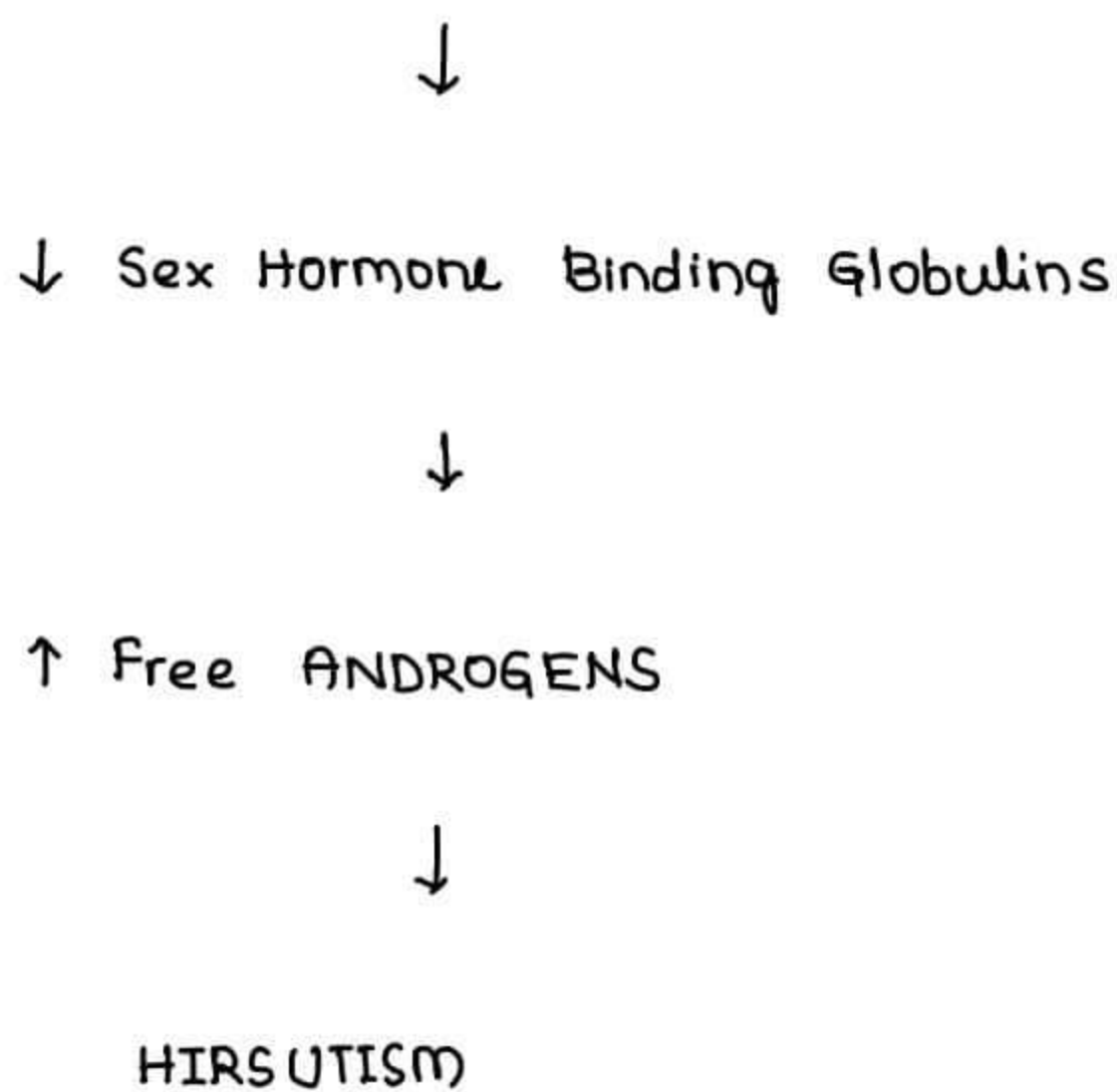
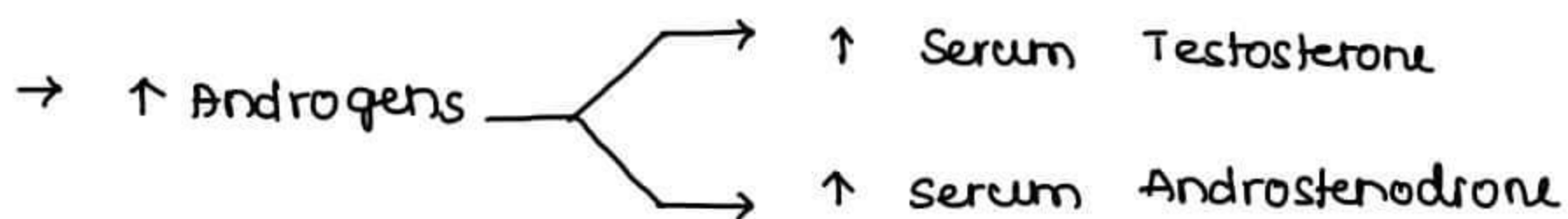
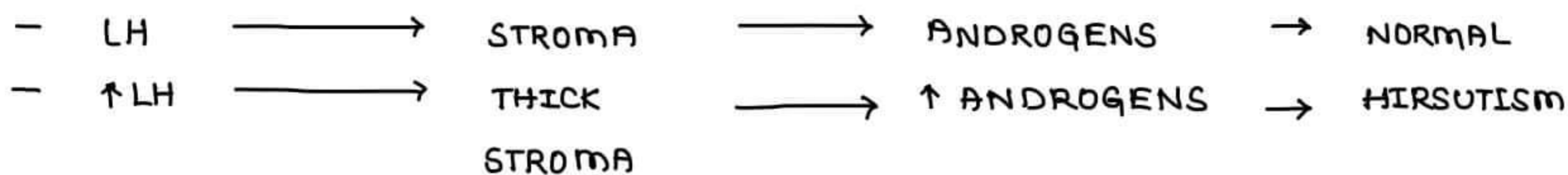
HIRSUTISM & ↑ Serum Testosterone & Androstenedione

- dit Hyperandrogenesim
- Androgen → Estrogens [Irreversible Reactⁿ]
Aromatase

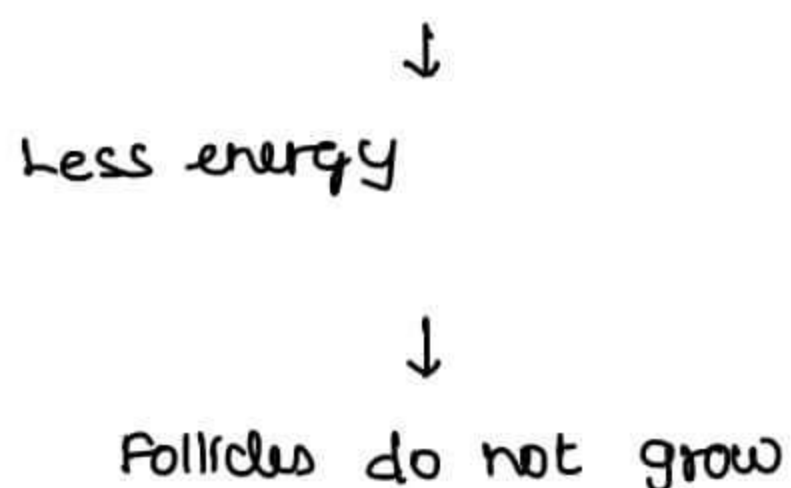
→ ↑ ESTROGEN



- LH : FSH → 1:1 Normal
- 3:1 > 2:1 in PCOD



INSULIN RESISTANCE → Less glucose uptake in ovary



- ↑ serum insulin
- Obesity & IR

→ Dark
Shiny
velvety
acral Deposits } ACANTHOSIS NIGRICANS
- cutaneous marker of Insulin Resistance

→ HA IR AN Syndrome

HA → Hyper Androgenism
IR → Insulin Resistance
AN → Acanthosis Nigricans

→ METABOLIC SYNDROME

→ waist → ≥ 35 inches [≥ 89 cm]
→ Triglycerides → > 150 mg/dl
→ HDL → < 50 mg/dl
→ BP → $> 130/85$ mm Hg
→ fasting glucose → 110-126
→ 75 gms OGTT 2hr values → $> 140-199$
→ At least 3 or more → metabolic syndrome

TREATMENT

ANOVLATION TREATMENT

- ① ↓ weight → ovulation [in 30% cases]
- ② Insulin sensitizers [metformin] → ovulate [in 30% cases]
- ③ CLOMIPHENE CITRATE → ovulate [in 80% cases]
→ Pregnant [in 40% cases]
- ④ Inj Recombinant FSH
- ⑤ Inj Human Gonadotropins
- ⑥ Aromatase Inhibitor → LETROZOLE [1st Line Drug]

IRREGULAR CYCLES TREATMENT

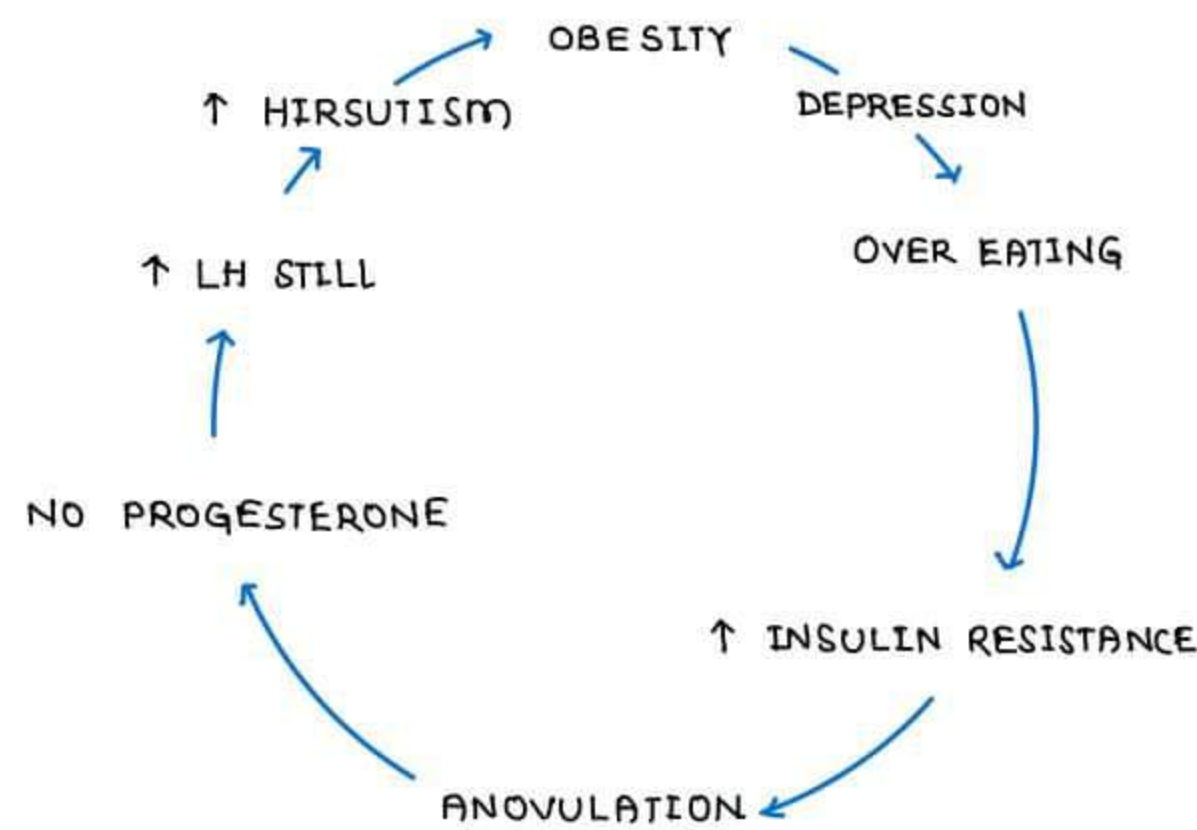
- ① COMBINED ORAL CONTRACEPTIVE PILLS
- ② PROGESTERONE ONLY PILLS
for 10 days [from 14th day/mid cycle]
for 5 days [from 20th day]

HIRSUTISM TREATMENT

① ANTI ANDROGENS

- CYPROTERONE ACETATE
- FINASTERIDE
- FLUTAMIDE
- SPIRANOLACTONE [1st line drug]

② COSMETIC TREATMENT FOR hair → Prevents Depression



15 - 20% women in world have PCOS [1 in 5 females]
 mc endocrinological disorder of reproductive age group → PCOS
 mc cause of Hirsutism → PCOS

ROTTERDAM / ESHRE / ANDROGEN EXCESS SOCIETY / ASRM CRITERIA

DIAGNOSTIC REQUISITES → Any 2 of the 3

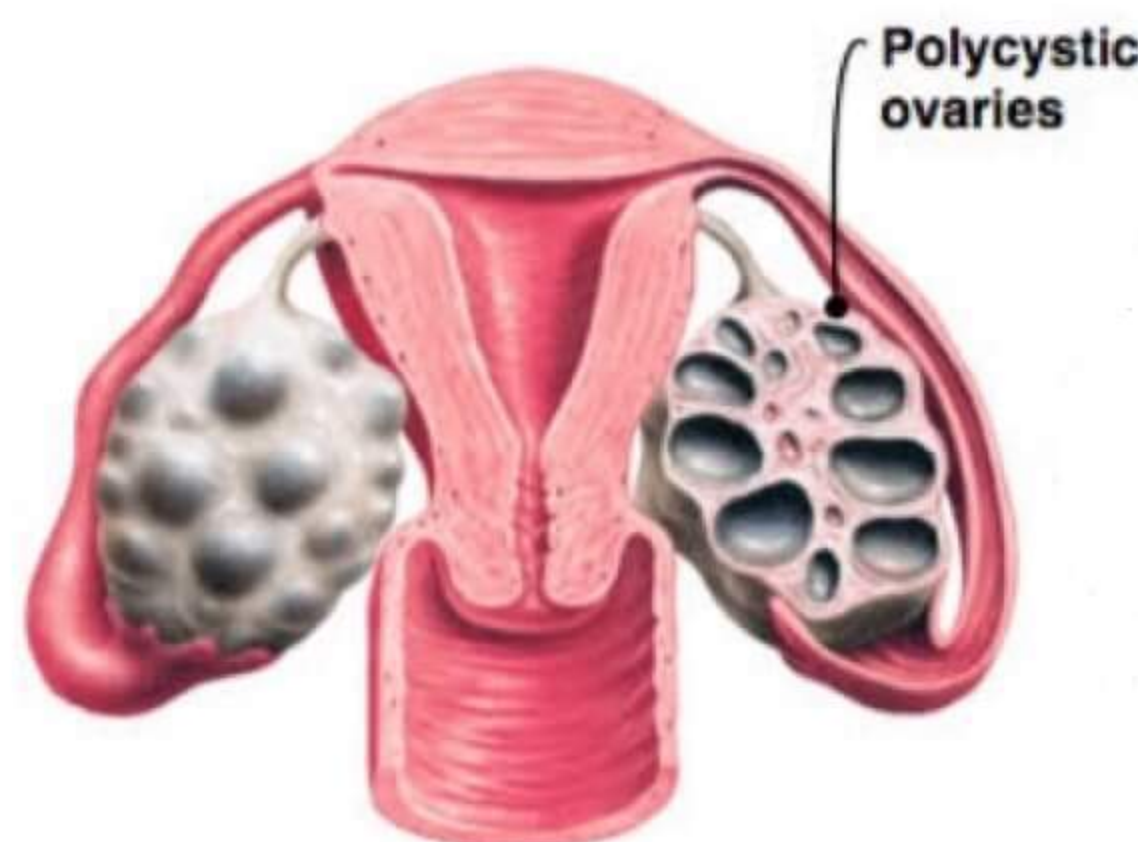
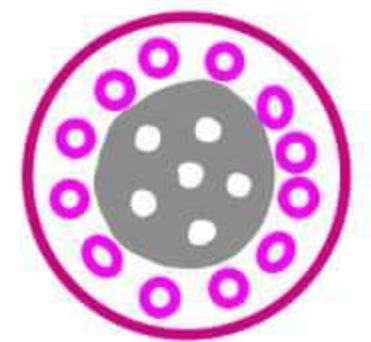
- ① Anovulation
- ② Hyperandrogenesim → clinical
- ③ +/- PCO Look on USG → Lab

LAPAROSCOPIC OVARIAN DRILLING

SURGICAL TREATMENT

① LAPAROSCOPIC OVARIAN DRILLING

- THICK STROMA → ↑ Local Androgens → Harder follicles
- PURPOSE → ↓ Androgenic stroma → Better follicular growth



CERVICAL CARCINOMA

→ mc cancer of women in India → CA Cervix

SCREENING

PAP SMEAR

- by Iyer's spatula
- Sensitivity → 47 to 62%.
 - ⊕ cytobrush → ↑ Sensitivity upto 90%
- SITE → Transformⁿ zone (Squamo Columnar Junction)
 - Endometrium → columnar
 - Vagina & cervix → Squamous
- Located at 1.7 to 2.3 cm from the External OS
changes locatⁿ i age group

ETIOLOGY

- | | |
|---|--|
| <ul style="list-style-type: none"> → HPV <ul style="list-style-type: none"> 16 → mc 18 → most malignant → HSV 1 & 2 → HIV 1 & 2 | <ul style="list-style-type: none"> → Commercial sex worker → women i many partners → Partner i STD → Early intercourse [< 16 yrs] → Smokers → Low Socio Economic Status |
|---|--|

→ Time to do pap smear

- Any women > 21 yrs of age
- Any women 3 yrs after 1st Sexual exposure in India
- From 21 to 29 years, Sexually active women should have cytology every 3 years
- From 30 - 65 yrs: CO-TEST [PAP + HPV] : if negative then 5 yearly
(if only cytology done, then once in 3 years if cytology is negative)
- After 65 yrs : NO MORE PAP, if 3 cytology are negative or 2 CO-TEST are negative

→ SUSCEPTIBLE TIMINGS

- at puberty
- after delivery

→ SCREENING TEST → done on women at risk

DYSPLASIA CLASSIFICATION

CIN I	→	1/3 rd abnormal	→	LOW GRADE LESION
CIN II	→	>1/3 rd to <2/3 rd abnormal		
CIN III	→	>2/3 rd abnormal	}	HIGH GRADE LESIONS
CIS	→	all cells are abnormal		

MANAGEMENT

CINI MANAGEMENT



- 6 monthly pap smear
- Antivirals & Antibiotics given
- HPV DNA is done

→ CIN I & CIN II → 65-80% regress spontaneously

CIN III MANAGEMENT

- conizatⁿ not done
- Problems \bar{c} conizatⁿ
 - short cx → incompetence → abortions
 - stenosed → infertility

→ COLPOSCOPIC [vaginoscopic] BIOPSY DONE

- Acetic Acid used
 - coagulate the proteins → make the area ACETOWHITE
 - Biopsy is taken from Acetowhite areas
- Schiller Iodine [LUGOL IODINE] can be used
 - stains the glycogen rich areas → MAHOGANY BROWN
 - Biopsy taken from Schiller NEGATIVE AREAS

- VIAA → visual inspectⁿ under Acetic Acid
 - VILI → visual inspectⁿ under Lugol's iodine
- } also be done

→ Results of colposcopic Biopsy

1. Invasive cancer cx → Rx by Radical hysterectomy
2. Biopsy Proven CIN III → Rx by LLETZ [LEEP]
 - LLETZ - Large Loop excisⁿ of transmissⁿ zone
 - LEEP - Loop electro surgical excisⁿ Procedure

→ Rx LASER CONIZATⁿ
 - expensive & difficult

- Sx CONIZATION [if > 35 yrs]
- HYSTERECTOMY [if > 40 yrs]

SYMPTOMS OF CA CERVIX

- Abnormal bleeding
 - Post coital bleeding [mc]
 - Post menopausal bleeding
- foul smelling discharge
- cancer cachexia
- cancer pain
- Pyometra → Dirty vaginal discharge
- Uremic symptoms

Mx OF POST COITAL BLEEDING

DO COLPOSCOPIC BIOPSY

- done in Post coital bleeding
- CIN □ [cervical Intra epithelial Neoplasia]
- CIS [carcinoma in situ]

STAGING

CLINICAL STAGING DONE WITH

- P/ vaginal Examination
 - P/ Speculum Examination
 - P/ rectal Examination [for Parametrium]
 - Proctosigmoidoscopy
 - cystoscopy [for bladder]
- ⊕ PET CT | MRI

STAGE I → LIMITED TO CERVIX

IA → MICROSCOPIC CANCER

A₁ → < 3 mm depth

A₂ → 3-5 mm depth

Transverse spread < 7 mm → ⊗ REMOVED

IB → CLINICAL / OBVIOUS CANCER

B₁ → < 2 cm

B₂ → 2 - 4 cm

B₃ → > 4 cm

STAGE II A → UPPER VAGINA INVOLVED [□ A1 → < 4 cm ; □ A2 → > 4 cm]

II B → PARAMETRIAL INVOLVEMENT BUT SHORT OF PELVIC SIDE WALL

STAGE III A → LOWER 1/3 rd VAGINAL INVOLVEMENT

III B → PARAMETRIAL INVOLVEMENT TILL THE PELVIC SIDE WALL [HYDRONEPHROSIS]

MC STAGE OF CA CERVIX PRESENTATION IN INDIA → STAGE III B

III C1	→ Pelvic Lymphnodes involved
C2	→ Para Aortic Lymphnodes involved

} IMAGING [PET CT/ MRI/ USG]
} REQUIRED

STAGE IV A → BLADDER & BOWEL INVOLVEMENT
IV B → DISTANT METASTASIS

* PINK COLOUR INDICATES NEW CHANGES

- cervix doesn't drain into inguinal group of lymph nodes
inguinal group of lymph nodes are not involved
- cervical cancer spreading to endometrium does not change staging

TREATMENT

STAGE I - IIA → Radical hysterectomy
STAGE ≥ IIB → chemo Radiation

Radiotherapy alone is effective & in all stages

Maximum radiatⁿ given at

POINT A

- 2cm above & 2cm lateral to external os
- ureter crosses the uterine artery [bridge over water] here
ureter is under the uterine artery
- Parametrium seen here
- upto 7500 to 8000 RADs given here

POINT B

- 3cm lateral to point A
- obturator lymph nodes at the pelvic side walls
obturator LN → Sentinel group of LN
- upto 6000 RADs given here

HISTOPATHOLOGY

- 1 Squamous cell carcinoma
 - a Large cell Keratinising variant [mc]
 - b Large cell Non Keratinising variant
 - c Small cell variant

- mc cause of death in CA cervix → Uremia
- 2nd mc cause of death → Haemorrhage
- 3rd mc cause of death → infectⁿ

- most common site of beginning of cancer → Anterior Lip

VACCINES

1 GUARDASIL

→ quadrivalent

16, 18, 6, 11

→ Non valent vaccine

6, 11, 16, 18, 31, 33, 45, 52, 58

2 CERVARIX

Bivalent

16, 18

→ chance of preventⁿ if given before exposure → Upto 90%.

chance of preventⁿ if given after exposure → Upto 40%.

→ Given after 9 yrs, upto 25 yrs

POST MENOPAUSAL BLEEDING

→ Any bleeding after 1 year of menopause

SYMPTOMS OF CA CERVIX & CA ENDOMETRIUM

CA CERVIX	CA ENDOMETRIUM
→ Post coital bleeding [mc]	→ Post menopausal bleeding
→ Post menopausal bleeding	→ Irregular vaginal bleeding
→ Irregular vaginal Bleeding	→ Pyometra
→ Foul smell discharge	→
→ Pyometra	
→ cancer cachexia	
→ Uremia, pelvic pain	

CAUSES OF POST MENOPAUSAL BLEEDING

→ MC cause in India

→ CA cervix

→ MC cause of post menopausal bleeding

→ CA cervix

→ MC cause of post menopausal bleeding [western]

1. Endometrial Atrophy [60-80%]

2. HRT [30%]

3. CA Endometrium [10%]

4. Endometrial Hyperplasia [10%]

5. Polyps [10%]

ENDOMETRIAL ATROPHY → SENILE ENDOMETRITIS → BLEED

→ Age group → \cong 65 yrs

PRESENTATION

- Pruritis [mc]
- mass in perineum
- Lump in perineum
- Cancer cachexia
- cancer pain

PREDISPOSING FACTORS

- HPV 6
- VIN [vulval intraepithelial neoplasia]
- CIN
- Lichen sclerosis
- Smoking
- Alcoholics
- Immuno suppressants
- Squamous hyperplasia

TYPES

- Squamous cell carcinoma [92%] → mc
- Melanoma [2-4%] → 2nd mc
- Basal cell carcinoma [2-3%] → 3rd mc

SQUAMOUS CELL CARCINOMA

BASALOID [WARTY]	KERATINIZING
<ul style="list-style-type: none"> → younger age group → multifocal → Predisposing factors <ul style="list-style-type: none"> HPV VIN Smoking 	<ul style="list-style-type: none"> → older age group → unifocal → Predisposing factors <ul style="list-style-type: none"> No a/w HPV a/w Lichen sclerosis a/w squamous hyperplasia

5 YEAR SURVIVAL

- ca vulva \bar{c} out Inguino femoral LN involvement → > 90%
- ca vulva \bar{c} Inguino femoral LN involvement → \leq 50%

→ Groin recurrence → POOR PROGNOSIS

DIAGNOSIS

- Labia majora involved in 60%
- clitoris involved in 15%
- IF lesion is
 - ≤ 1cm → excisional Biopsy
 - > 1cm → Keys punch Biopsy



KEYS PUNCH

STAGING

STAGE I		Limited to vulva
	IA	Size → < 2cm, Invasion → < 1mm
	IB	Size → > 2cm, Invasion → > 1mm
STAGE II		Adjacent Organ involvement
		Lower 1/3 rd vagina Lower 1/3 rd of urethra, anus
STAGE III		Inguinal femoral LN involvement
	IIA _i	one LN → > 5mm
	A _{ii}	one or two LN → < 5m
	IIB _i	two LN → > 5mm
	B _{ii}	more than 3 LN → < 5mm
	IIIC	LN involvement ⊕, ± extra capsular spread
STAGE IV		
	IVA _i	upper urethra, upper vagina, rectal involvement growth stuck to pelvic bone
	A _{ii}	fixed or ulcerated LN
	IVB	Distant metastasis Pelvic LN

- STAGE I }
STAGE II } NO LN INVOLVEMENT

TREATMENT

- STAGE I & II → Radical vulvectomy
Sentinel LN Biopsy
Superficial Inguinal
Deep inguinal
femoral
- if negative → Radical vulvectomy alone
if positive → Radical vulvectomy + LN removal
- STAGE III & IV → chemotherapy → follow ± surgery
Mitomycin
5FU
- Radiotherapy → follow ± surgery
- STAGE IA → WIDE EXCISION

FIBROIDS

- monoclonal tumors
- Pseudo capsule may be present
- always starts in intramural area → Pushes fibroid
either submucosal or
subserosal

ETIOLOGY

- incidence
 - 30% of women
 - >50yrs → 80%
- 2.5 times of more chance if female relative has one
- a/w chromosomal abnormality [40%]
 - 12 - 14 Translocatⁿ
 - 12 trisomy
 - 7 deletion
- obese women
- red meat eater
- nulliparous women
- Estrogens & progesterons
- Growth factors
 - Transforming growth factor β
 - Platelet derived growth factor
 - Epidermal growth factor

CLINICAL FEATURES

SYMPTOMS

→ PAIN

- d/t contraction
compression
compaction
degeneration

→ BLEEDING

- d/t ↑ endometrial recruitment
poor contractility
↑ vasodilator Prostaglandins

→ INFERTILITY

- d/t compression
FB action

→ BOWEL & BLADDER SYMPTOMS

- ↑ frequency [mc]
- retentⁿ of urine also present

DIAGNOSIS

- USG → also used for mapping
- MRI [Best]

R_x OF FIBROIDS

- Small [<5cm] & NO pain/bleeding/infertility → NO R_y required
- Small [<5cm] & pain/bleeding/infertility → R_y given
- Large [>10cm] → R_y given
- Large [>10cm] & NO pain/bleeding/infertility → R_y given

→ Larger size fibroid ∝ DEGENERATIVE CHANGES

- Hyaline degeneratⁿ
- Red degeneratⁿ
in pregnancy, in 2nd trimester
mostly conservative R_y
never operate
- Lipoid degeneratⁿ
- calcific degeneratⁿ → WOMB STONE
- sarcomatous degeneratⁿ [<0.5%, rarest]

MEDICAL MANAGEMENT

- ↓ Bleeding
- ↓ Size

① NSAIDs

② GnRH Analogues by Depot form → Down regulates pituitary

③ GnRH Antagonists [CETROTIDE]

④ MIFEPRISTONE → antiprogestin → ↓ Size

⑤ PROGESTERONE [IUCD Levonorgestrol] → ↓ Bleeding

⑥ UTERINE ARTERY EMBOLIZATION

- uses Poly vinyl Alcohol particles
- upto 80% reductⁿ in pain & bleeding

⑦ HIGH FREQUENCY USG

- HIFU → High frequency focussed USG
- MRGFUS → MR Guided focussed USG

SURGICAL MANAGEMENT

PRE REQUISITES

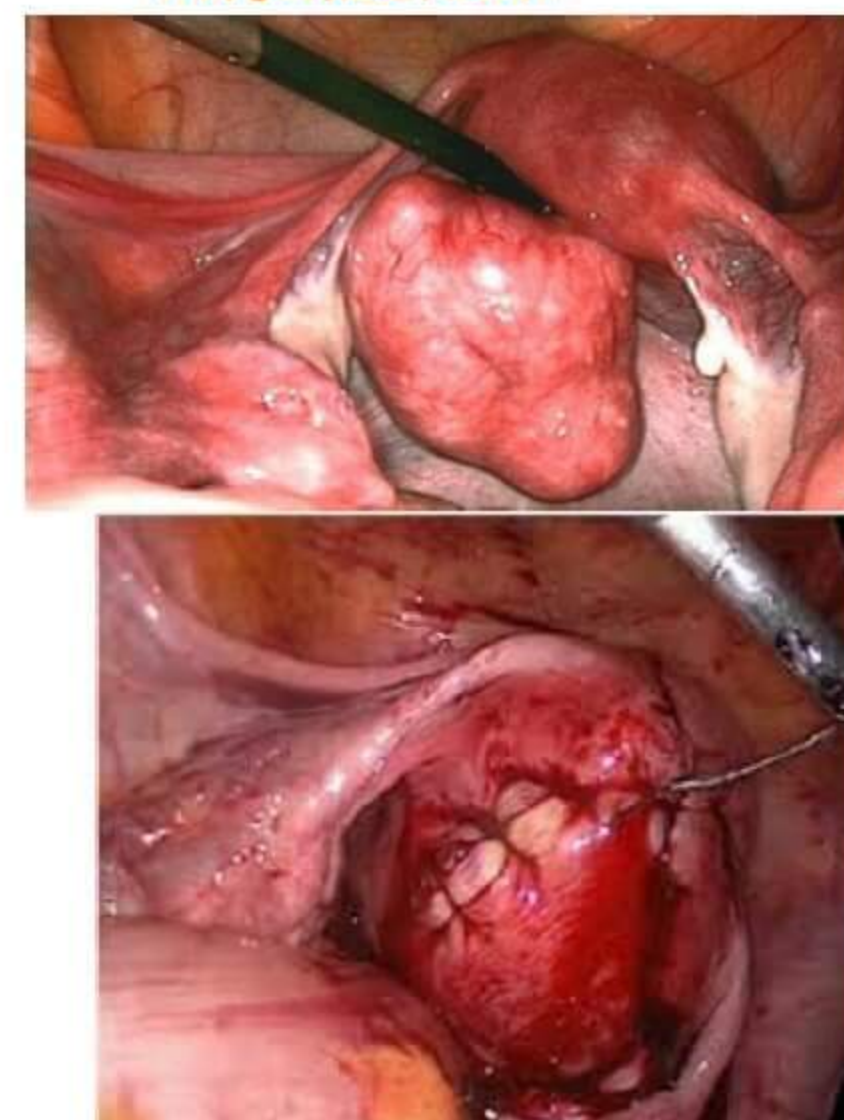
- Hb → > 10gm%
- arrange blood
- minimize incision on uterus
- avoid posterior wall incision [SIE → Retroversion]

- Technique to ↓ blood loss
 - tourniquet usage
 - vasopressin usage

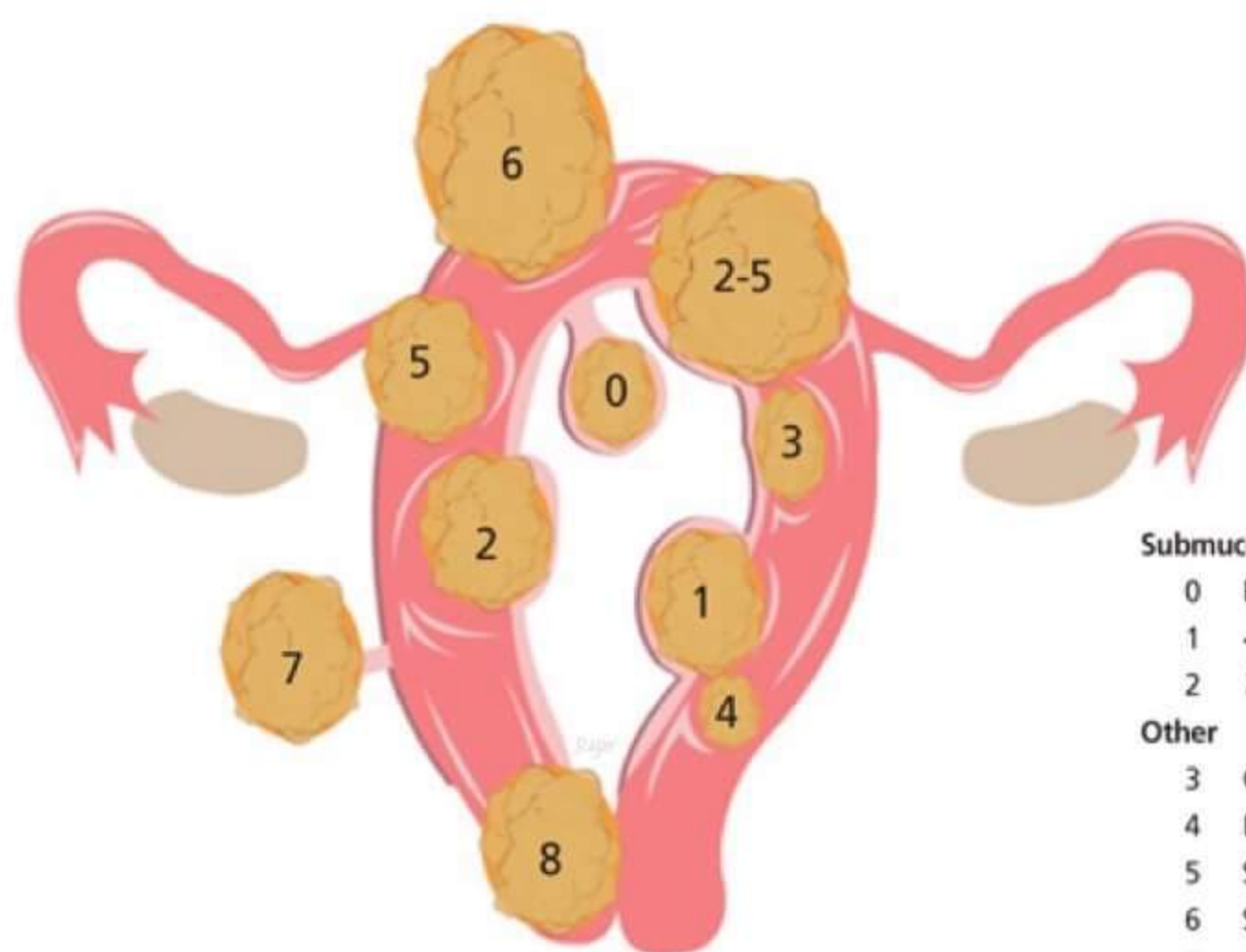
- ↓ handling of fallopian tube
- Semen Analysis

- FIBROID IN PREGNANCY → Rx is CONSERVATIVE
- in younger women → MYOMECTOMY
- in older women → HYSTERECTOMY

MYOMECTOMY



FIGO CLASSIFICATION



Leiomyoma subclassification system

- | | |
|------------|--|
| Submucosal | |
| 0 | Pedunculated intracavitary |
| 1 | <50% intramural |
| 2 | ≥50% intramural |
| Other | |
| 3 | Contacts endometrium 100% intramural |
| 4 | Intramural |
| 5 | Subserosal ≥50% intramural |
| 6 | Subserosal <50% intramural |
| 7 | Subserosal pedunculated |
| 8 | Other (specify e.g., cervical parasitic) |

- If a fibroid is impinging on 2 locations at once, then the mucosal relatⁿ should mention first

HYSTERO SCOPIC MYOMECTOMY

- indicated for Type 0, Type 1 Fibroids [some Surgeons do it for Type II Fibroids]
- Size should be < 3 cm
- The fibroid is ≤ 50% intramural
- The FLUID which distends the uterus have different criteria
- DEFICIT OF MEDIA TO BE CONSIDERED

	WARNED	STOP SURGERY
NON ELECTROLYTE MEDIA		
Glycine	750 ml	1500 ml
ELECTROLYTE MEDIA		
Saline	1000 ml	2500 ml

unipolar current can't be used i electrolyte media

→ **PROBLEMS OF EXCESS OF FLUID**

- Pulmonary Edema
- cerebral edema
- cardiac failure
- Hyperammonemia
- Hyponatremia
- DEATH

LAPAROSCOPIC MYOMECTOMY

- Type 5,6,7 Fibroids are easily removed by this procedure
- Subserous fibroids are easily removed
- SALIENT FEATURES
 - ↳ Blood loss ↓
 - ↳ Earlier recovery
- **CRITERIA**
 - 3-4 fibroids of 5 cm size or lesser
 - 1 fibroid of 15 cm or smaller

HYSTERECTOMY

CLASSIFICATION

- Total
- Subtotal
- Abdominal
- vaginal
- \bar{c} or \bar{c} out BIL Salpingo oophorectomy
- \bar{c} or \bar{c} out U/L Salpingo Oophorectomy
- Emergency
- Planned
- Obstetric indication
- Gynecological indications
- Laparoscopic
- open
- robotic

INDICATIONS

- Fibroid uterus [40-45%] [mc]
- Endometriosis [15-20%]
- Prolapse [15%]
- Dysfunctional uterine bleeding
- Pelvic inflammatory Disease
- Chronic Pelvic Pain

PRE REQUISITES

- consent
- rule out pregnancy
- Pap smear examinatioⁿ
- arrange blood
- Precautions measures for Venous thrombo embolism
- INDUCTIVE Antibiotics [\bar{c} in 1 hr]

COMPLICATIONS

INTRA OP INJURIES to Bowel, Bladder & vessels

URETER INJURY

- In a hysterectomy, mc site of injury → at the site of crossing the uterine artery
- Overall, mc site of injury → at the Pelvic Brim

POST OP COMPLICATIONS

HEMORRHAGE

- Immediate → visualized
if retroperitoneal [Look for signs - ↑PR, shock]
- Reactionary → in 1st 24hrs d/t slippage of ligature
- secondary → >24hrs uptill 2-3 weeks d/t infections

WOUND INFECTIONS [4-6% cases]

CUFF CELLULITIS [vaginal cuff]

URINARY RETENTION - dit bladder hypotonia

URITERIC INJURY

- Post op flank pain
- do USG/CT for Dx
- do cystoscopy to localise the block

BLADDER INJURY

- Vesico vaginal fistula
- Uretero vaginal fistula

PROLAPSE OF FALLOPIAN TUBE through the vault



CUFF DEHISCENCE

- advise not to have intercourse for 6 weeks

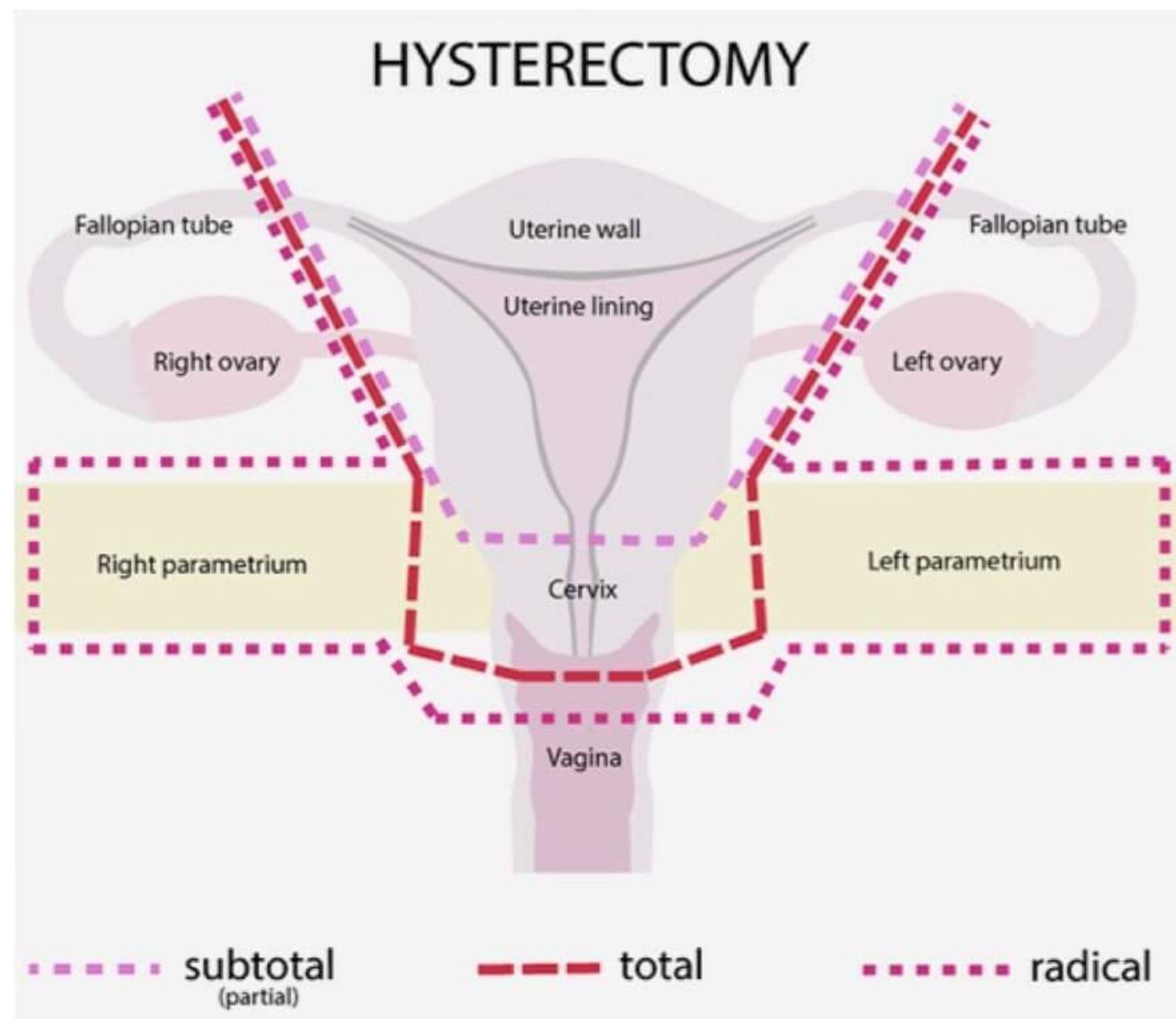
LAPAROSCOPIC HYSTERECTOMY

① LAVH [Laparoscopic Assisted vaginal Hysterectomy]

- Diagnostic laparoscopy + vaginal Hysterectomy
- Adhesiolysis + vaginal Hysterectomy
- Resection of Adnexae
- uterines Resected after bladder mobilization

② Total Laparoscopic Hysterectomy

METHODS



OVARIES

- conserve ovaries at least till 50 yrs
- if surgical oophorectomy done < 50 yrs, more chances of Coronary Artery Disease by 65 yrs

PROPHYLACTIC OOPHORECTOMY

- BRCA I & BRCA II
- 1° female relatives having CA Breast, CA Ovary → 10-50% Risk

ABNORMAL UTERINE BLEEDING

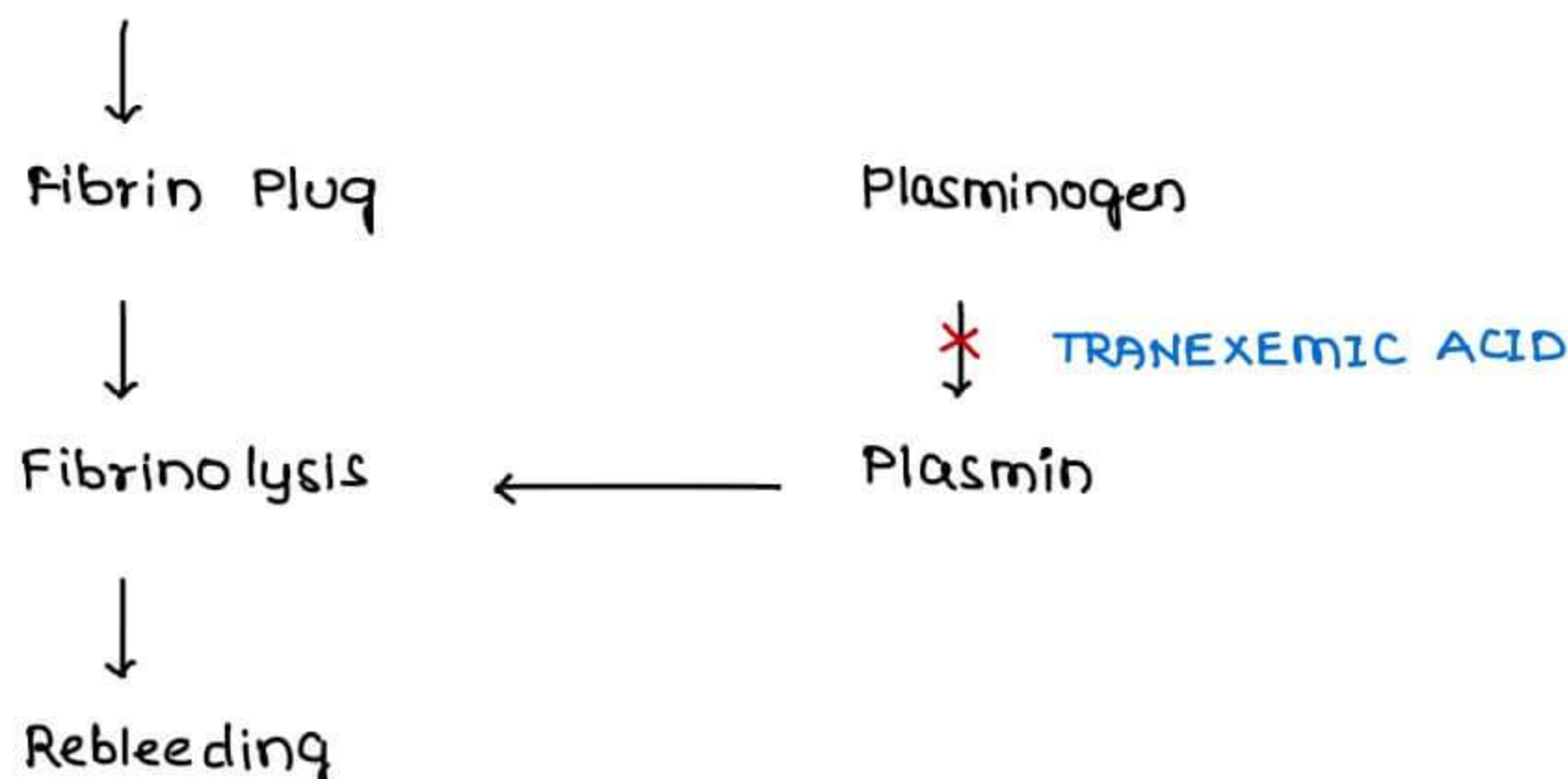
MANAGEMENT

1 NSAIDs

- inhibits vasodilator prostaglandins
- ↓ Pain
- ↓ bleeding in uterine blood vessels
- 1st Line drug

2 TRANEXEMIC ACID

- Bleeding



- 1st Line drug

3 HORMONAL MANAGEMENT

- PROGESTERONE → stabilizes the endometrium
- ESTROGEN → forms new endometrial glands

ESTROGEN WITHDRAWAL > PROGESTERONE WITHDRAWAL

- COMBINED ORAL CONTRACEPTIVE PILLS
- DANAZOL / ANDROGENS → Leads to Endometrial atrophy
- GnRH ANALOGUES → down regulatⁿ of Pituitary
- IUCD LEVONORGESTROL [MIRENA]

4 SURGICAL MANAGEMENT

- THERAPEUTIC CURETTAGE /
HEMOSTATIC CURETTAGE /
DILATATION & CURETTAGE [DNC]
- B/L UTERINE ARTERY EMBOLIZATION by PVA [poly vinyl Alcohol] Particles
- TRANS CERVICAL RESECTION OF ENDOMETRIUM [TCRE]
- MICROWAVE METHOD
- THERMAL METHOD → 87°C × 8 min
- HYSTERECTOMY

CAUSES

- 1 **T**umors
- 2 **I**nfections
- 3 **P**regnancy related causes ; For Example :
 - 28th July → Last menstrual Period
 - ↓
 - 11th August → ovulated
 - ↓
 - Embryo implanted on fallopean tube on 17th August
 - ↓
 - 28th August missed her period
 - ↓
 - 30th August bleeding occurs
 - mc fate of ectopic pregnancy → vascular inefficiency
 - embryo degeneratⁿ
 - ↓ Progesterone
 - SHEDDING OF DECIDUA
 - ↓
 - other outcomes of ectopic pregnancy → Tubal abortⁿ
Rupture
- 4 **S**ystemic Disorder
 - Hypothyroidism
 - Liver disorder
- 5 **C**oagulatⁿ defects → von villebrand disease , ITP
- 6 **D**rugs → Heparin, warfarin, COCP, IUCD
- 7 **D**ysfunctional uterine bleeding → Diagnosis of exclusion

DUB [DYSFUNCTIONAL UTERINE BLEEDING]

CONDITIONS

ANOVLATORY DUB

- 1 Pubertal girls
- 2 Perimenopausal women
- 3 Metropathia Haemorrhagica

→ ANOVULATORY DUB → mc

in 65% of anovulatory DUB, the Endometrium is Hyperplastic

OVULATORY DUB

1 Corpus luteal ↓ed function



Irregular ripening



Premenstrual Spotting / Bleeding

2 Corpus Luteum ↑ed function



Irregular shedding



Post menstrual spotting / Bleeding

MULLERIAN ABNORMALITIES

EMBRYOLOGICAL DEVELOPMENT & IT'S ABNORMALITIES

- Female internal genitalia derived from MULLERIAN / PARA MESONEPHRIC DUCT
- male internal genitalia derived from WOLFIAN / MESONEPHRIC / GARTNER DUCT

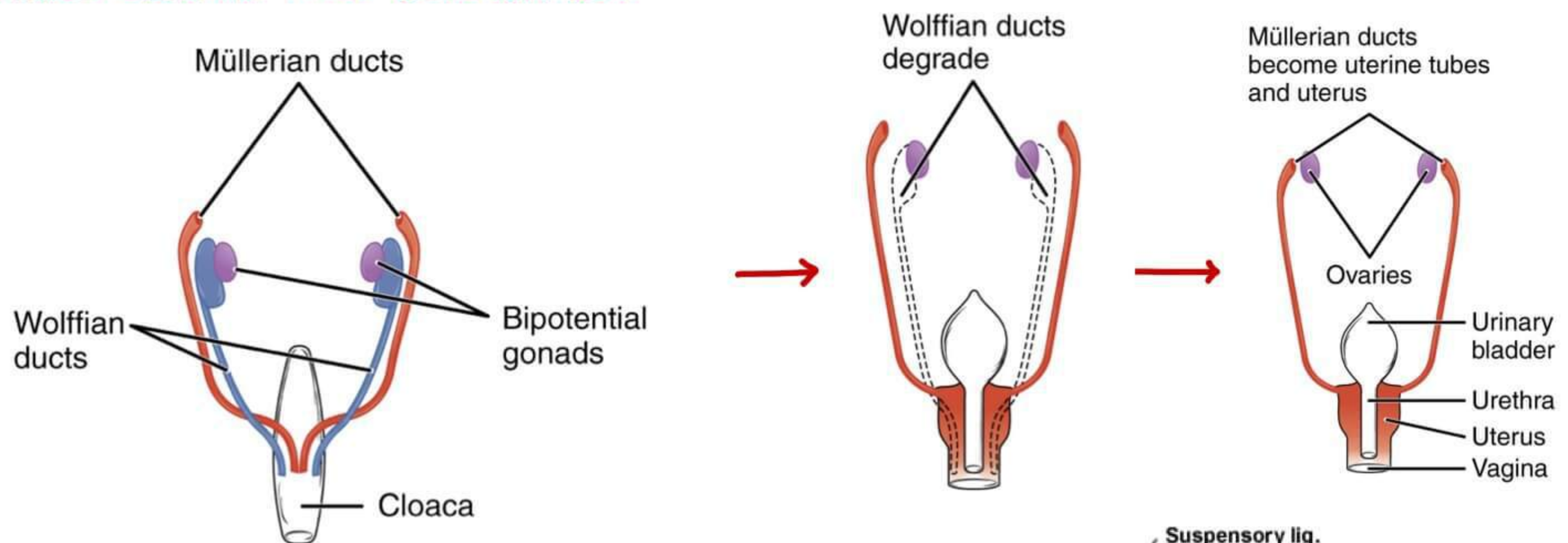
MULLERIAN DUCT DERIVATIVES

- Uterus
- cervix
- fallopean tubes
- 4/5th OF vagina
 - Lower 1/5th derived from UROGENITAL SINUS
 - ovaries are derived from GENITAL RIDGE

WOLFIAN DUCT DERIVATIVES

- Epididymus
- vas deferens
- Seminiferous tubules
- Prostatic urethra

FEMALE GENITAL TRACT DEVELOPMENT



FATE OF WOLFIAN DUCT IN FEMALES

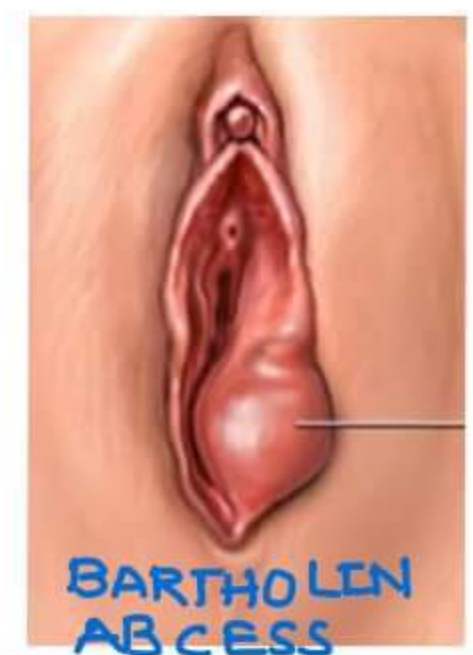
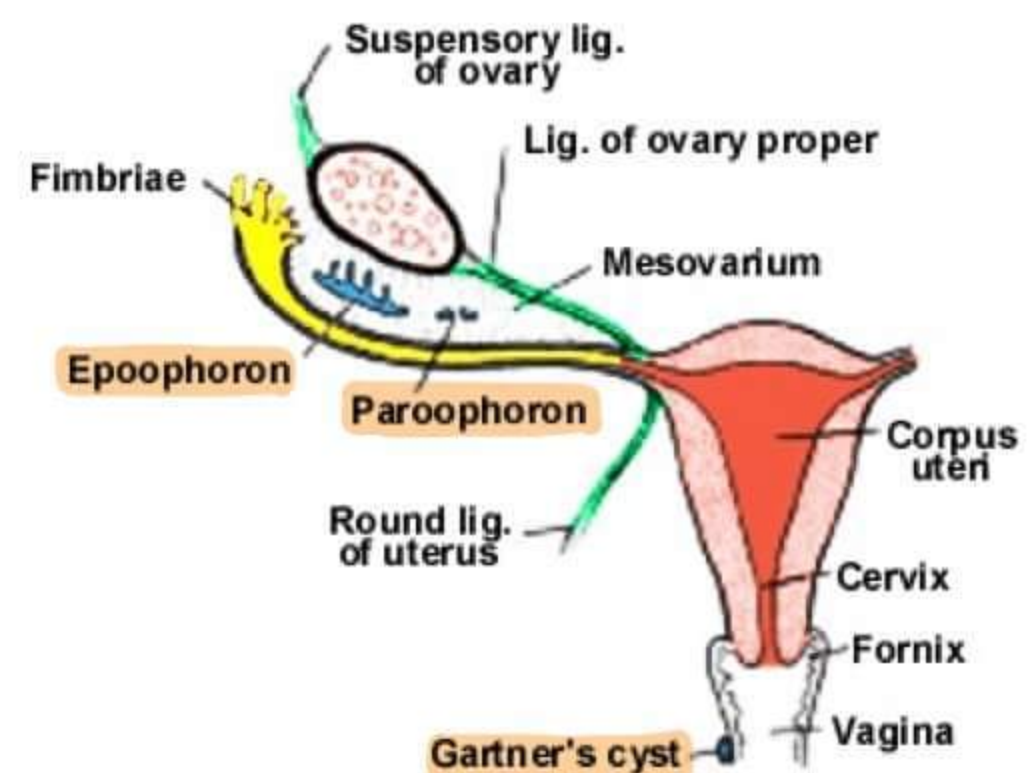
- Remnants of wolfian duct
 - Epooophoron → above the ovary
 - Paraooophoron → beside the ovary
- obliterated male duct at upper lateral vaginal wall → may lead to

GARTNER CYST

- mostly asymptomatic
- R_x by SIMPLE EXCISION

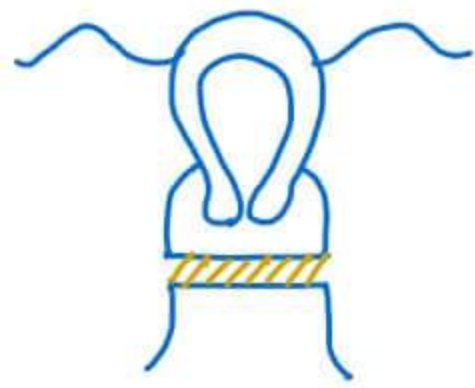
BARTHOLIN ABCESS

- gland present at anterior 2/3 rd & posterior 1/3 rd of vulva
- R_x by MARSUPIALIZATION [Exteriorizatⁿ of cavity]



MULLERIAN DUCT ANOMALIES

VERTICAL FUSION DEFECTS



TRANSVERSE VAGINAL SEPTUM



VAGINAL ATRESIA



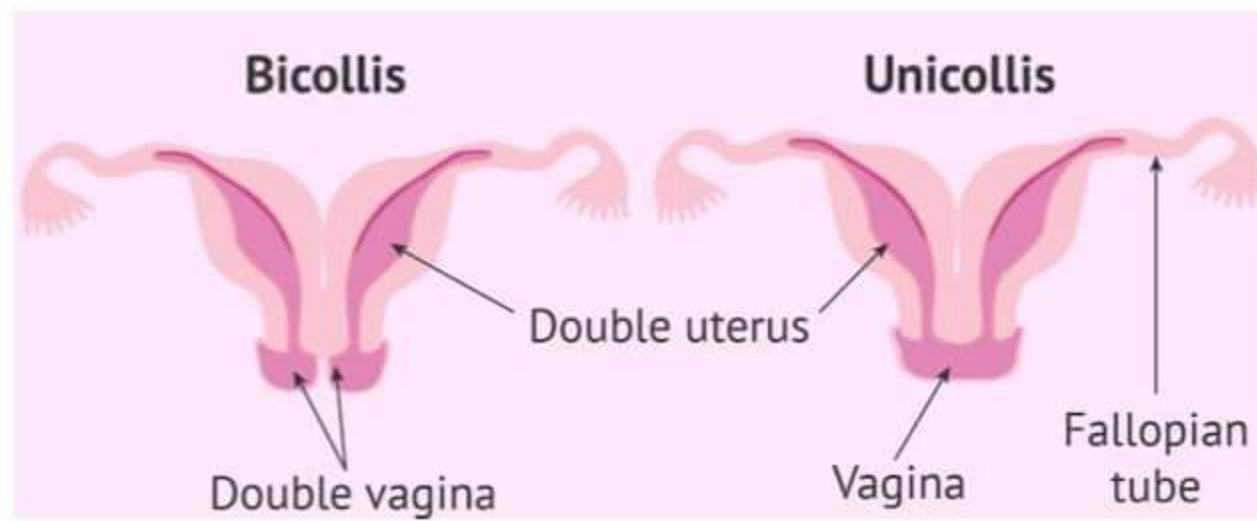
CERVICAL VAGINAL ATRESIA



COMPLETE MULLERIAN AGENESIS

LATERAL FUSION DEFECTS

1 DIDELPHYS



2 UNICORNUATE



3 SEPTATE



4. BICORNUATE



SEPTATE VS BICORNUATE UTERUS

- On Hysterosalpingography, both septate & bicornuate uterus look similar
- Angle between 2 cavities
 - $< 90^\circ$ [Acute] → Septate uterus
 - $> 90^\circ$ [obtuse] → Bicornuate uterus
 - Distance b/w 2 cavities
 - $< 4\text{cm}$ → Septate uterus
 - $> 4\text{cm}$ → Bicornuate uterus
 - Fundus
 - Broad → Septate uterus
 - indented/dimpling → Bicornuate uterus

SEPTATE UTERUS IS THE SINGLE MOST COMMON MULLERIAN DEFECT

- Best way to distinguish b/w Septate & bicornuate uterus
 - DIAGNOSTIC LAPAROSCOPY + HYSTEROSCOPY
 - MRI [Best imaging method]
- **TREATMENT**
 - Septate uterus → removal of septum through hysteroscopy
 - Bicornuate uterus → unification surgery [STRASSMAN'S or JONE'S]
- Only indicatⁿ of unifying the uterus in bicornuate uterus → Recurrent Abortions

CRYPTOMENORRHEA

- Menstruatⁿ present [Hematometra - blood in uterus ; Hematocolpos - blood in vagina] but menstrual blood not coming out
 - Transverse vaginal septum
 - vaginal atresia
 - Cervical vaginal atresia
 - Imperforate hymen



IMPERFORATE HYMEN

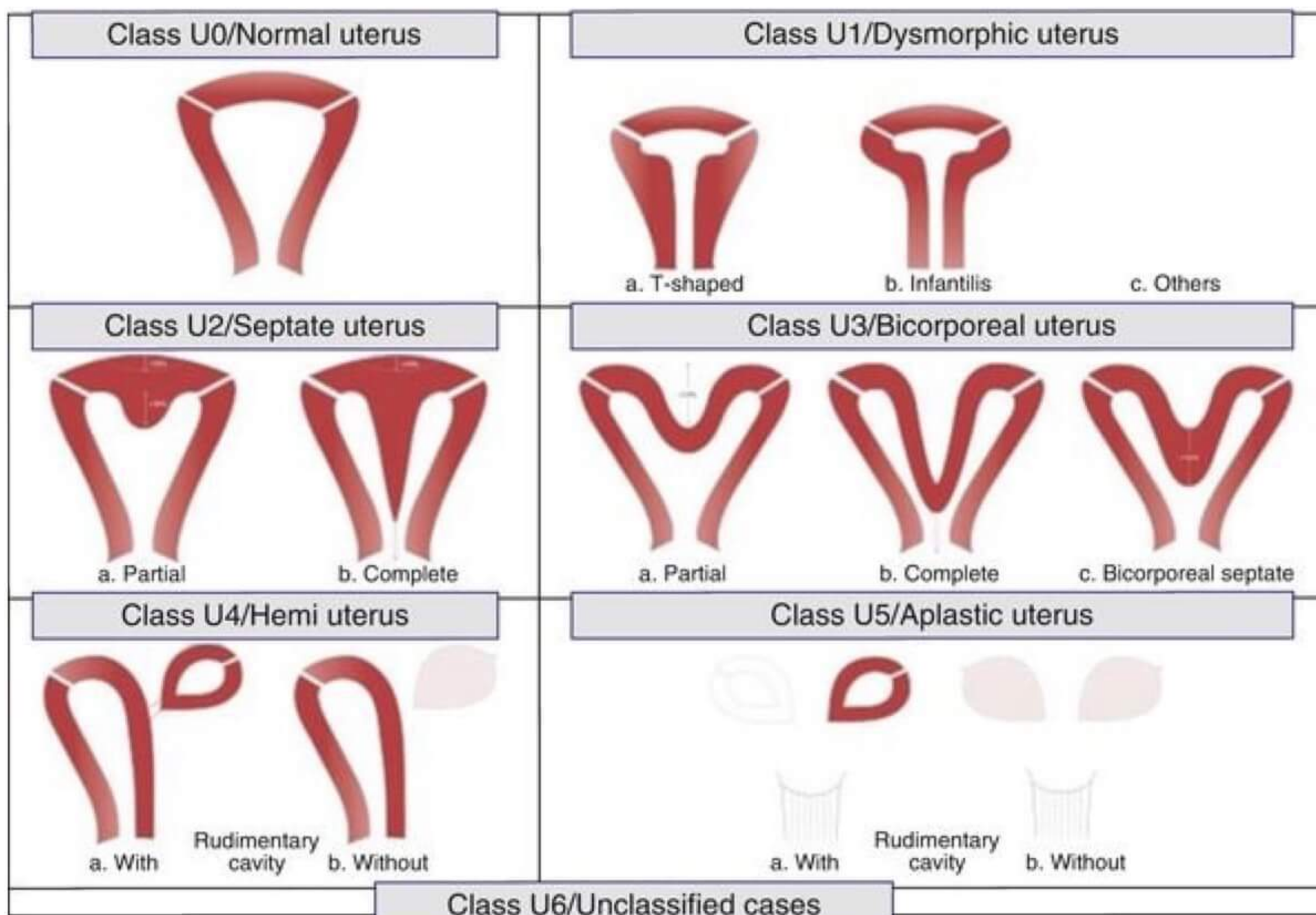
IMPERFORATE HYMEN

- Not a mullerian anomaly
- It is a canalatⁿ defect
- Rx → 1. cruciate incisⁿ given
2. cut along the incision



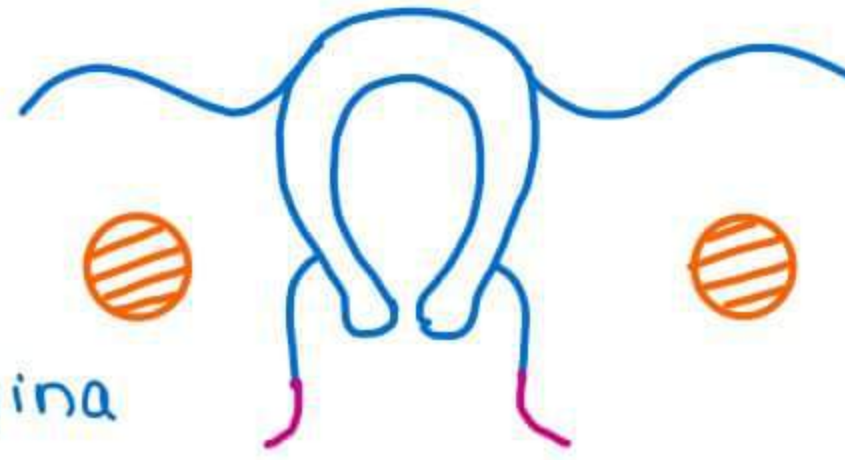
ESHRE CLASSIFICATION

→ European Society for Human Reproduction & Embryology



STRUCTURES

uterus
cervix
fallopian tubes
upper 4/5th of vagina



OVARIES

LOWER 1/5th OF VAGINA

DERIVED FROM

Mullerian / Paramesonephric ducts

Genital ridge

urogenital sinus

FORMATION OF EXTERNAL GENITALIA

→ AFTER 6 WKS OF intrauterine life, Sexual differentiatⁿ begins

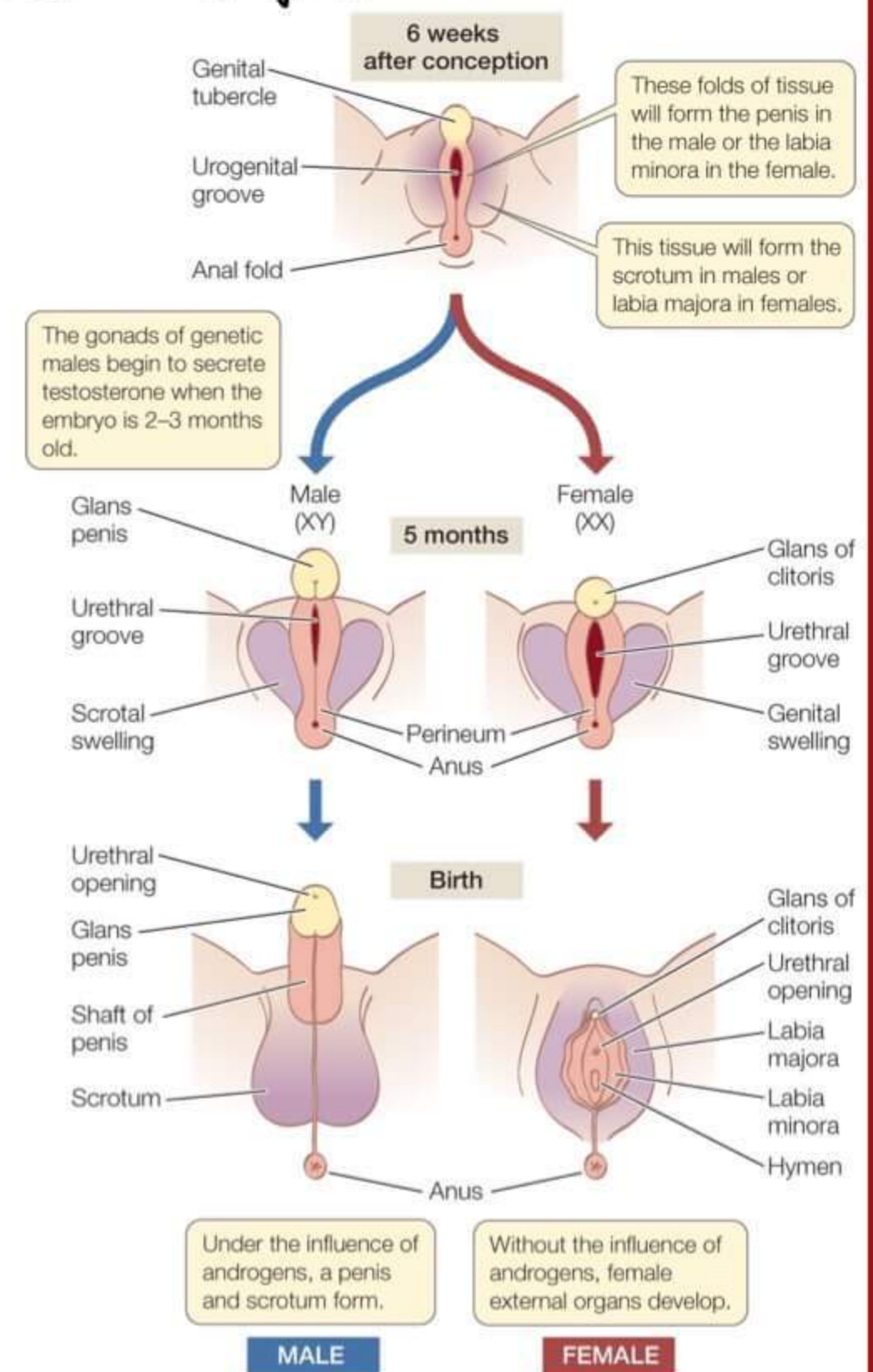
→ Sexual differentiatⁿ is based on

Genetic sex [46 xx or 46 xY]
Gonadal sex [Ovary or testes]
Phenotype [vulva or Phallus]

→ Y chromosome has

- Sex determining Region Y [SRY]
- Testes determining factor [TDF]

→ Ext. genital formatⁿ is under the influence OF ANDROGENS



> 6 WKS



MALE

TESTES



ANDROGENS



Descent of testes
Formatⁿ of scrotum
formatⁿ of Penis

> 6 WKS



FEMALE

OVARIES



NO ANDROGENS



Labia majora
labia minora
clitoris
Lower 1/5th of vagina by urogenital sinus

DEFAULT / BASIC HUMAN SEXUALITY → FEMALE

	MULLERIAN AGENESIS	TESTICULAR FEMINIZATION SYNDROME/ ANDROGEN INSENSITIVITY SYNDROME
KARYOTYPE	→ 46 XX	→ 46 XY
GONAD	→ ovary	→ Testes
UTERUS, TUBES	→ Absent	→ Absent
VAGINA	→ shallow blind	→ shallow blind
VULVA	→ Normal	→ Normal
BREAST	→ Feminine	→ Large feminine
PERIODS	→ Absent	→ Absent
ANDROGENS	→ 20-80 ng/dl	→ 200-800 ng/dL
PUBIC/AXILLARY HAIR	→ Present	→ Absent

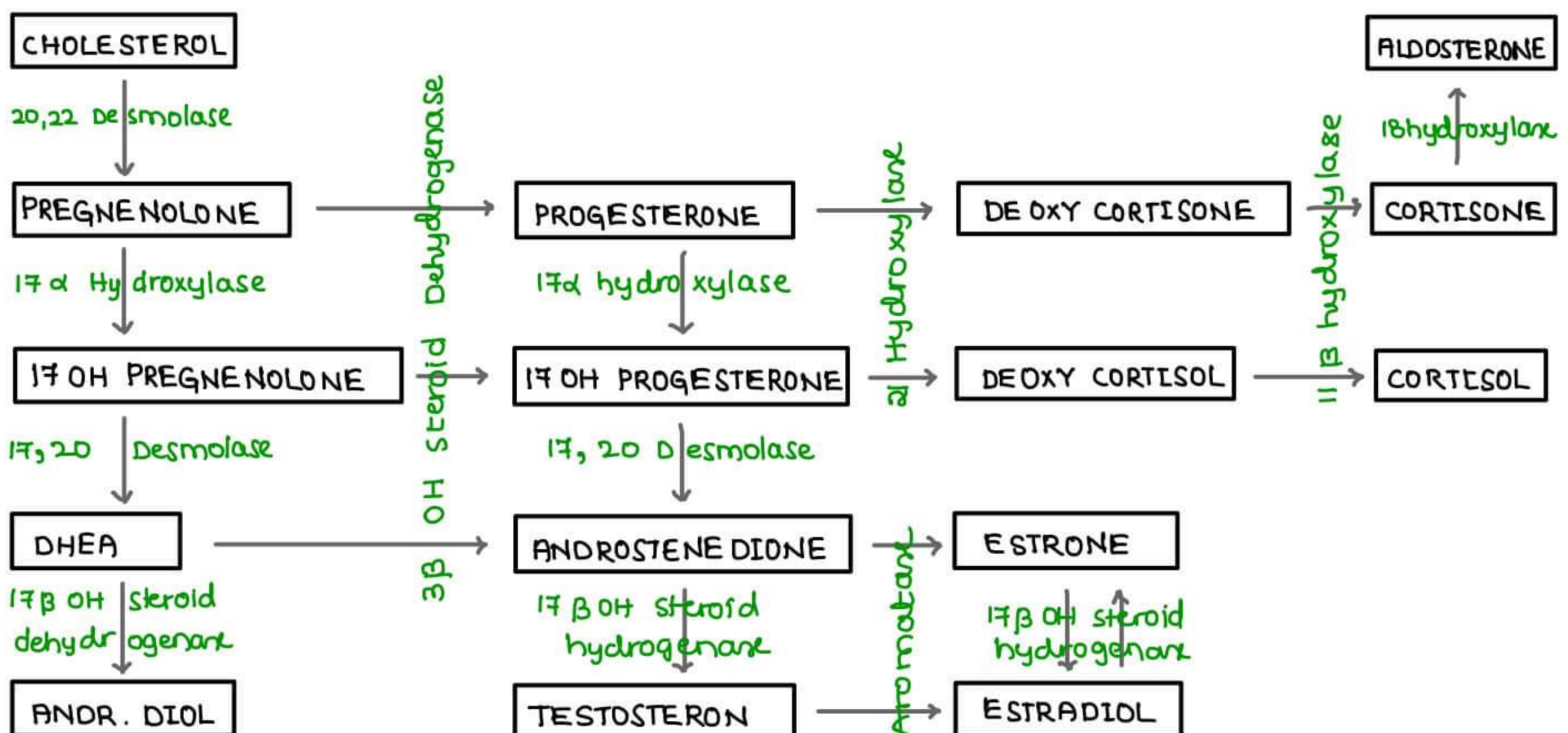
→ In Testicular feminizatⁿ syndrome,

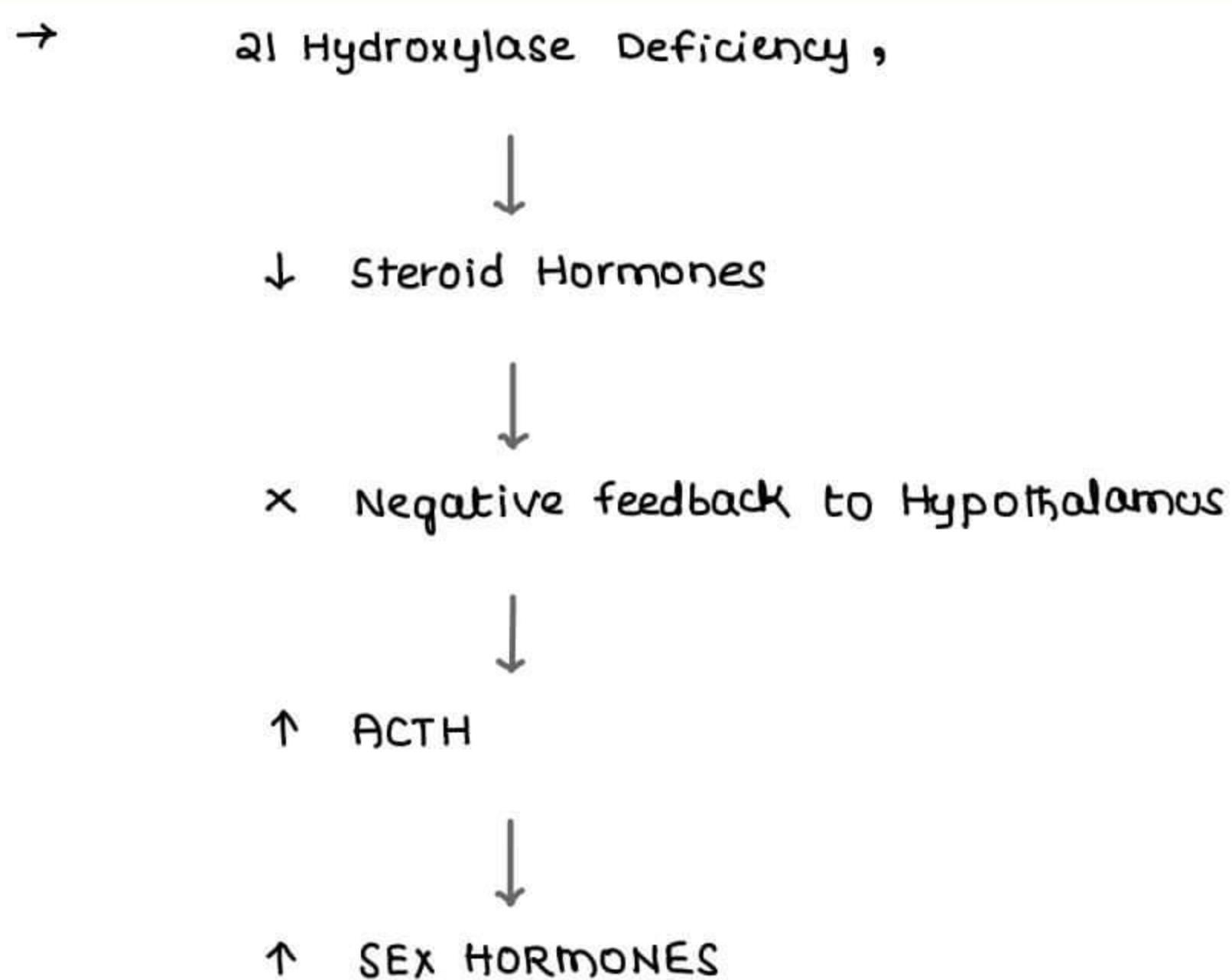
- In periphery, ANDROGENS $\xrightarrow{\text{Aromatase}}$ ESTROGENS
- ESTROGENS → Large feminine breasts
- Pubic & axillary hair absent

→ TFS is distinguished from Mullerian Agensis by

- Absent axillary & pubic hair [clinical suspicion]
- Karyotyping → 46 XY
- USG reveals undescended testes [mostly in abdomen
occasionally in inguinal canal]

→ undescended testes removed in TFS at the time of puberty





CONGENITAL ADRENAL HYPERPLASIA

→ due to deficiency of 21 Hydroxylase enzyme

① classical variety

→ Boy → Precocious puberty

→ In Girl

- penis & scrotum + nt
- NO testes } AMBIGUOUS GENITALIA

② salt losing variety

- ↓ Na⁺

↓ H₂O

↑ K⁺

- fatal to the baby [boy or girl]

③ Late onset / Adult onset Adrenal Hyperplasia

→ Rx by Long term steroids

→ mc cause of CAH → 21 β hydroxylase deficiency

2nd mc cause of CAH → 11 β hydroxylase deficiency

→ PREVENTION

- start the steroids at the time of Dx of next pregnancy

- GENETIC MALE & PHENOTYPIC FEMALE → MALE PSEUDOHERMAPHRODITE
 GENETIC FEMALE & PHENOTYPIC MALE → FEMALE PSEUDOHERMAPHRODITE

EXAMPLES OF

- MALE PSEUDOHERMAPHRODITE → TFS
 FEMALE PSEUDOHERMAPHRODITE → CAH

→ TRUE HERMAPHRODITE

- MALE + FEMALE KARYOTYPE &
- MALE + FEMALE GONADS → OVOTESTIS &
- MALE + FEMALE EXTERNAL GENITALIA

GONADAL DYSGENESIS

SWYER SYNDROME

- 46 XY Female

TURNER SYNDROME

- streak gonads
- ↓ Estrogens
- small uterus
- Primary amenorrhea

MIXED GONADAL DYSGENESIS

- Male + Female Karyotype
 Male + Female Gonads
- u/L undescended testes → not working
 - contralateral streak ovary → not working
- External genitalia → female
 → 1/3 rd of mixed gonadal dysgenesis have Turner phenotype

IN GONADAL DYSGENESIS, THE EXTERNAL GENITALIA IS ALWAYS OF FEMALE

- mc cause of 1° Amenorrhea → Gonadal Dysgenesis
 mc type of gonadal dysgenesis → Turner syndrome

- ⊙ Short stature
 1° amenorrhea
 streak gonad
 on USG → hypoplastic uterus
- } TURNER SYNDROME

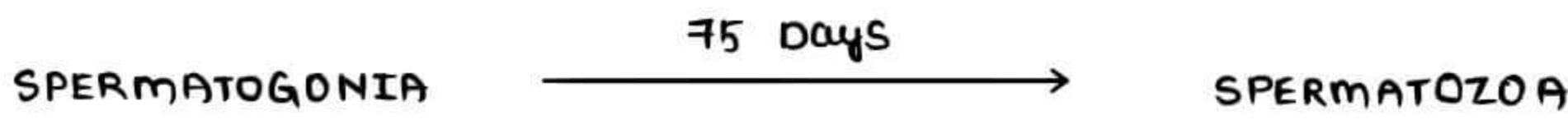
- 46 XX → 1 Barr body [Normal female]
→ 46 XO → NO Barr body → TURNER SYNDROME
Short stature
Shield chest
Low set hair line
Lymphedema
Normal Intelligence

- 46 XY → NO Barr Body [Normal male]
→ 47 XXY → KLINEFELTER SYNDROME
Tall stature
Gynecomastia
Obesity
azoospermia
infertility
Mental Retardatⁿ

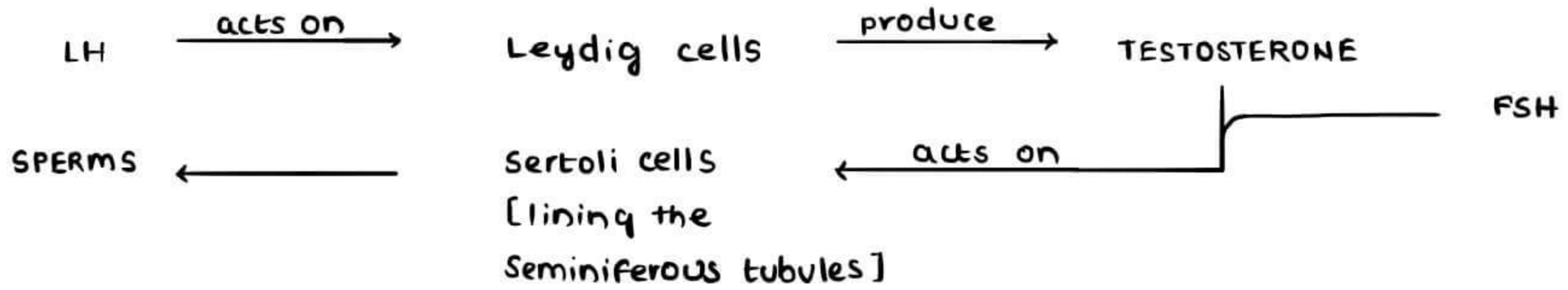
Q Which one has the best clinical prognosis ?

- A CAH
B TFS
C MIXED GONADAL DYSGENESIS
D TRUE HERMAPHRODITES

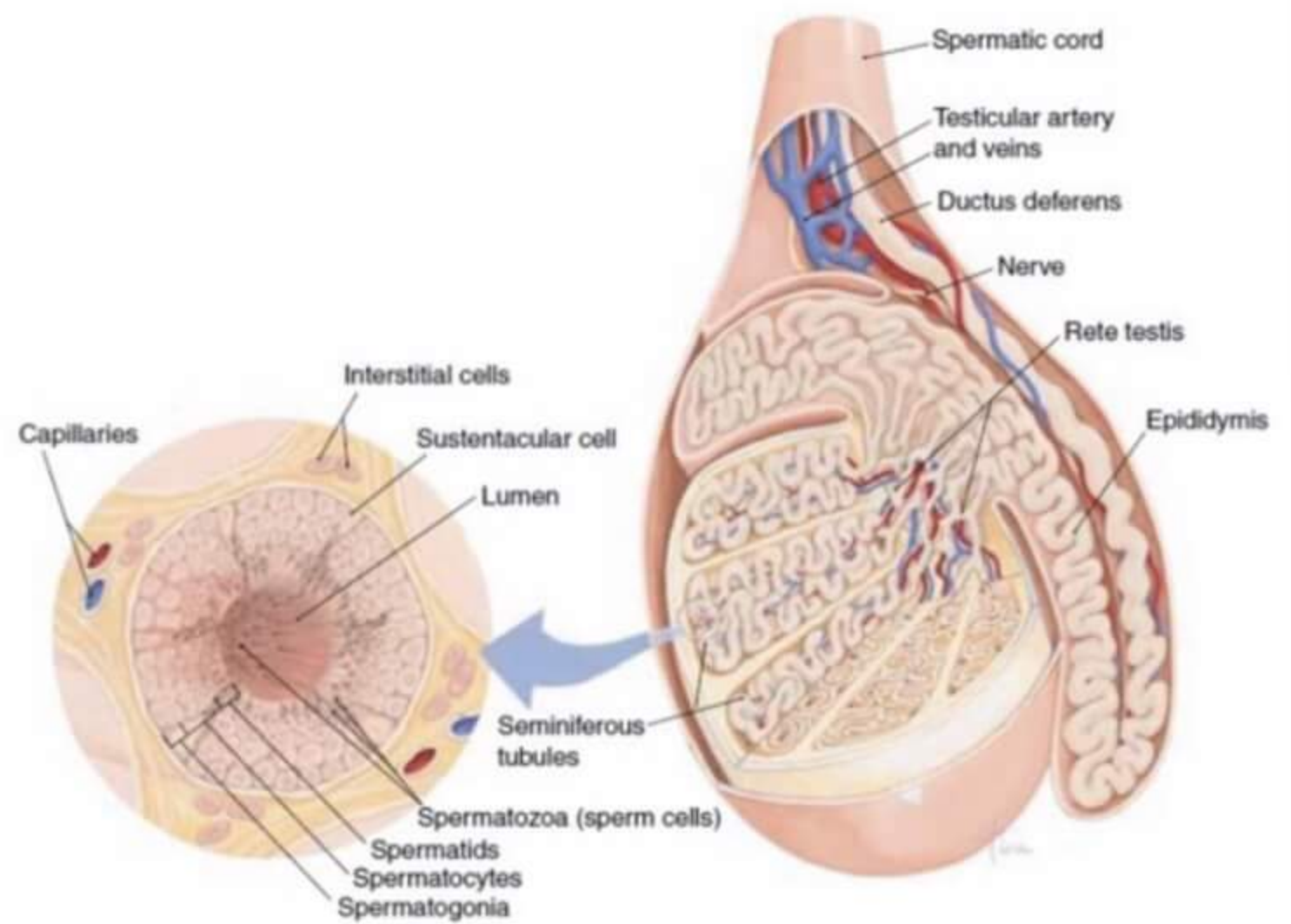
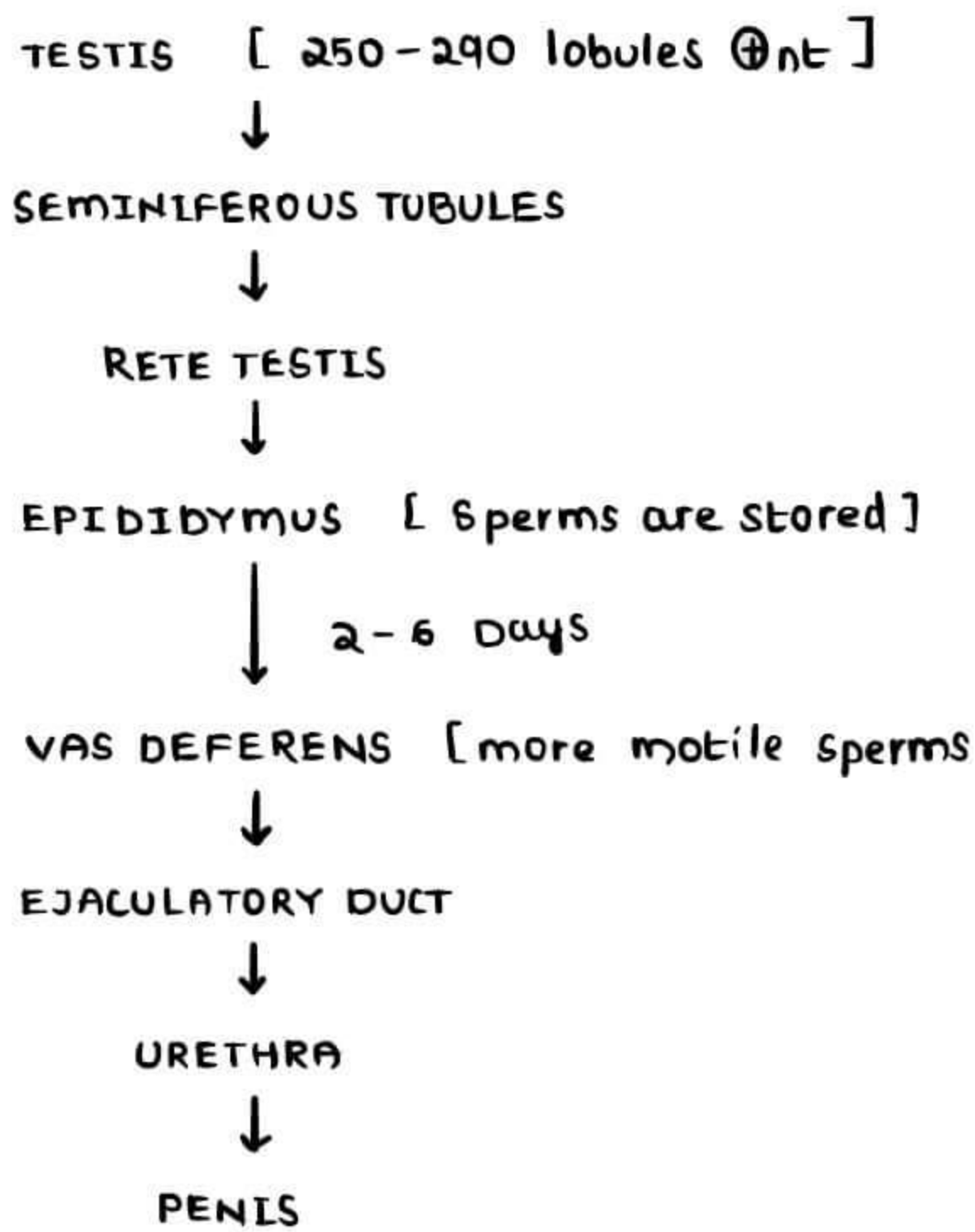
SPERMATOGENESIS



IN TESTIS

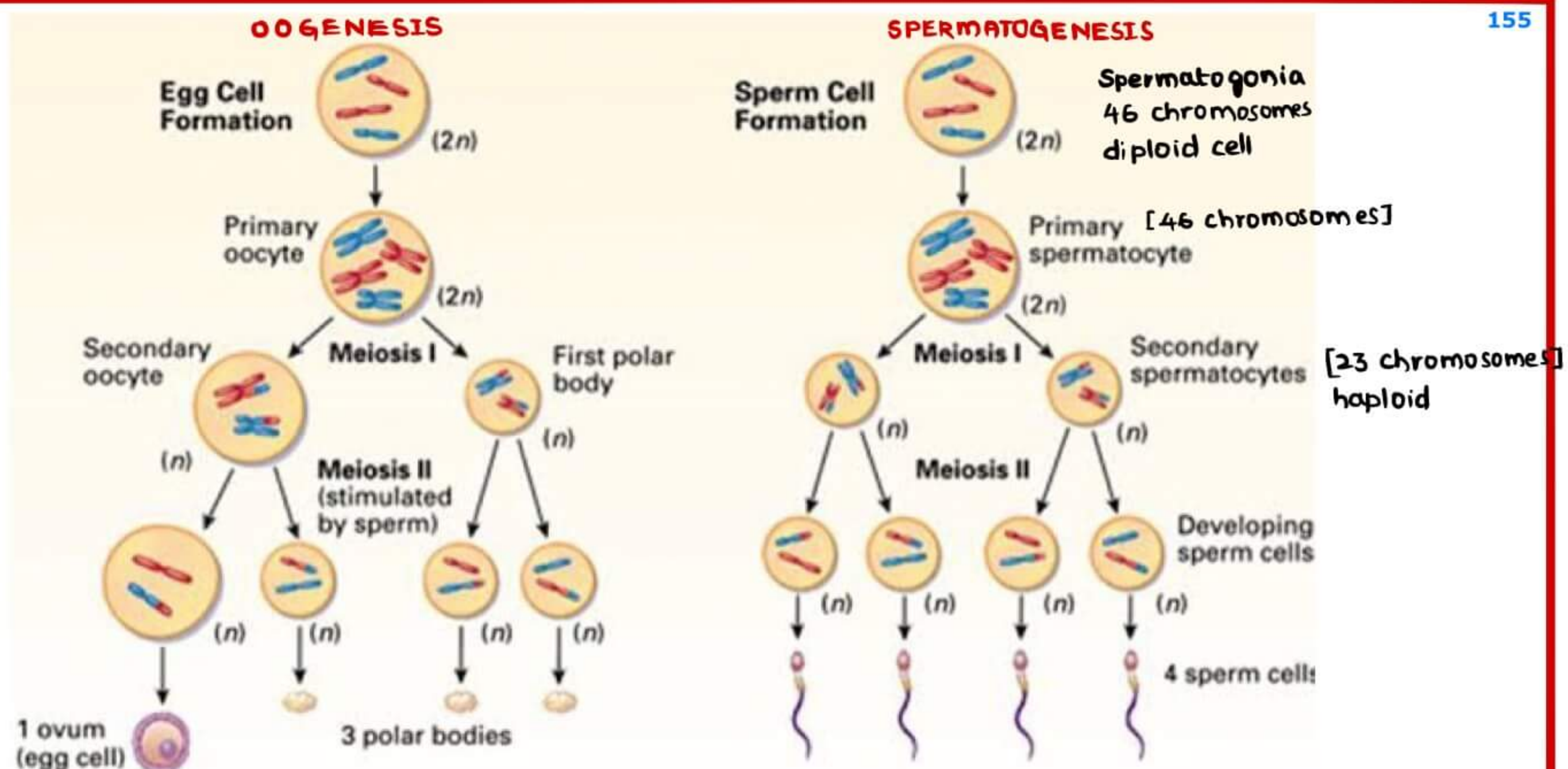


SPERM PATHWAY



SPERMATOGENESIS

- 1 Spermatogonia gives rise to 4 Sperms
- SPERMATID [non - motile] 48 hrs → SPERMATOZOA [motile]
- Formation of Spermatozoa From Spermatid include
 - ↳ condensation of nucleus occur
 - ↳ Formation of tail occur
 - ↳ motility
 - ↳ Acrosomal cap [Golgi apparatus]



OOGENESIS

- 1 oogonium gives rise to 1 ovum & 3 polar bodies [extra genetic material]
- oogonia starts forming from 8 wks of IUL
- PRIMARY OOCYTES
 - maximum at 20 wks of IUL [6-7 wks]
 - present at birth
 - Rest in Prophase I [meiotic division] at the time of birth
 - Meiosis I completed at the time of ovulation [puberty]
- secondary oocyte & 1 polar body released [at the time of ovulation]
- secondary oocyte is arrested in Metaphase [meiosis II]
- After fertilization, 2nd polar body & ovum are released

AFTER EJACULATION, Sperms reach posterior fornix of vagina $\xrightarrow{2 \text{ min}}$ ampulla

CAPACITATION OF SPERMS

- the potential to fertilize oocyte
- takes place in cervical mucus
- steps responsible for capacitation
 - ↳ removal of inhibitory mediator [cholesterol]
 - ↳ Tyrosine phosphorylation
 - ↳ influx of Ca^{2+} ions

ACROSOMAL REACTION

Acrosomal cap
[Golgi apparatus]

↓ Acrosome breakdown

Release Acrosin to fertilize oocyte
[Penetrate zona pellucida of oocyte]

↓

Acrosin [Hyaluronidase] will soften the
zona pellucida [Acrosome reaction]

CORTICAL REACTION

one sperm gets inside

↓

cortical granules released in
perivitelline space of oocyte

↓

This reaction makes the oocyte
impermeable again

First event of puberty → Growth spurt

SPECIFIC EVENTS OF PUBERTY IN GIRLS

- Breast → Thelarche [T]
- Pubic axillary hair → Pubarche [P]
- Height → Linear growth spurt
- Periods → Menarche

→ Time taken for the above specific events → 4.5 yrs






TIMING

- TIMING to start of Periods → 10 - 12 yrs
- If periods start at 9 - 10 yrs → EARLY PERIODS
- If periods start at < 8 yrs → PRECOCIOUS PUBERTY
- mc cause of precocious puberty → Idiopathic
- Rx of precocious puberty → GnRH analogues

DELAYED PUBERTY

- no periods till 13 yrs of age
- Pubarche + nt, no periods till 15 yrs

TANNER STAGING [For breast & pubic hair development]

- STAGE I → NO growth, no mound, no development of breast 
- STAGE II → Significant amount of growth ⊕ nt 
- STAGE III → much developed breast
→ nipple is above the midplane of breast mound 
- STAGE IV → much more developed breast
Secondary mound present 
- STAGE V → Bigger breast [mature breast]
no secondary mound
nipple is below the midplane 

- Girls starts development of puberty → 10 - 12 yrs [10.5 yrs]
- Boys starts his pubertal develop → 11.5 yrs
- SPECIFIC EVENTS OF PUBERTY IN BOYS
 - Testicular size [T]
 - Penile length [P]
 - Pubic hair
 - Growth spurt

- SEQUENCE OF PUBERTY ONSET : Obese girls → Normal girls → Low weight → Anorexic
- After attaining 23.5% Fat, girl period starts
- Estrogen mostly responsible for events of puberty in girls like breast development, uterine development, periods
- For Boys androgens mostly responsible for pubertal develop

INFERTILITY

- 15 - 20% couples are infertile
- **INFERTILE** → AFTER 1YR OF UNPROTECTED INTERCOURSE
- CHANCE OF CONCEPTION \bar{c} UNPROTECTED INTERCOURSE
 - 90% couple → 1 yr
 - 80% couple → 1st 6 months
 - 10% couple → next 6 months
- 1 Act of intercourse at 14th day, chance of conceptⁿ → 4-8%
- chance of conceptⁿ \bar{c} many acts in one month → 25%

CAUSES

- % of Distribution of causes responsible for infertility
 - MALE → 20-30%
 - FEMALE → 30-40%
 - MALE + FEMALE → 10-40%
 - UNEXPLAINED → 10-20%

MALE CAUSES

- oligospermia
- Azospermia

FEMALE CAUSES

- Anovulatory factors > Tubal factors

WHO CLASSIFICATION OF ANOVULATION

- | | | |
|----------|---------------------------------|---------------------------|
| TYPE I | → Hypogonadotropic Hypogonadism | |
| TYPE II | Normogonadotropic Hypogonadism | → PCOS |
| TYPE III | Hypergonadotropic Hypogonadism | → Premature Ovarian Fail. |
| TYPE IV | Hyperprolactinemia | |

HISTORY TAKING

MALE SPECIFIC HISTORY

- Act of intercourse
- Infections → mumps, TB, Filariasis, STDs
- Previous S_x → Orchidopexy / undescended testes
→ Hernia S_x, Varicocele S_x, Hydrocele S_x
- Alcoholic, smoker

FEMALE SPECIFIC HISTORY

- Infections → Recurrent PID, Endometriosis, TB pelvis
- MTP / Abortions
- Alcohol, smoking

INVESTIGATIONS

1 SEMEN ANALYSIS

→ 1st investigation to be done

→ 2010 WHO SEMEN ANALYSIS

PH	→	> 7.2
volume	→	> 1.5 ml
concentration	→	> 15 million/ml
count	→	> 39 million [36-42 million]
motility	→	> 40% [32% must be actively motile]
Morphology	→	> 4% should be \textcircled{N} [KRUGER'S STRICT CRITERIA]
vitality	→	> 58% should be normal
Leucocyte count	→	< 1×10^6 / ml

2 WOMEN

P/V Examination

TVS

Ovulation Tests

- Basal Body Temperature [$>0.5^\circ\text{F}$]
- USG - Follicular Monitoring
- LH → > 15 IU
- Sr. Progesterone → $> 3\text{ng/ml}$ on day 21
- Endometrial Biopsy

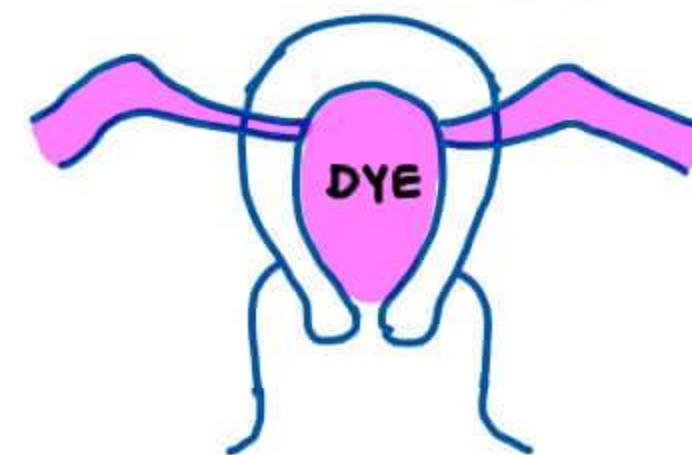
Hystero Salpingo graphy

- Tells about uterine cavity
- Tells about Tubal patency

Laparo Hystero Scopy

- Better investigatⁿ to know anatomy
- Diagnostic
- Therapeutic

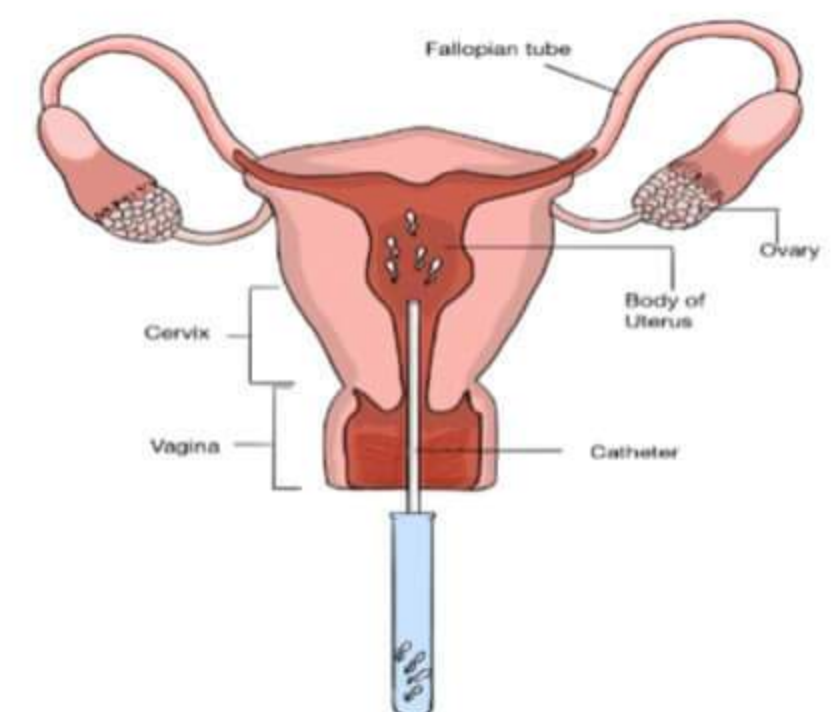
HYSTERO SALPINGOGRAPHY



TREATMENT

1 OVULATION INDUCTION

- Indicated for anovulation
- clomiphene citrate
- Letrozole
- HMG
- FSH



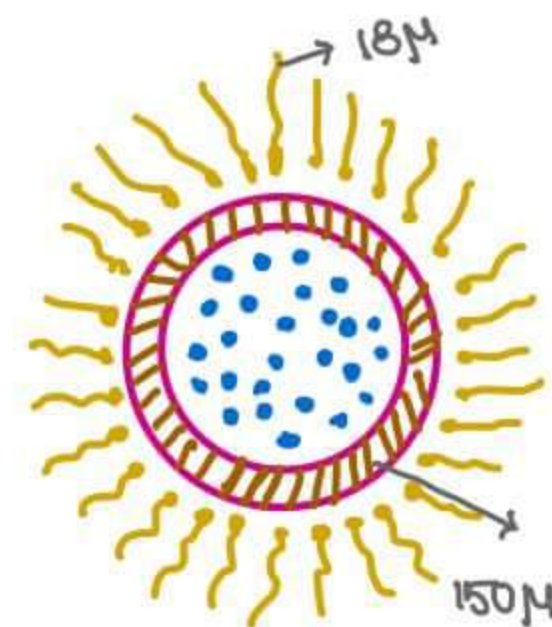
Intra uterine insemination

2 INTRA UTERINE INSEMINATION by Washed Sperms

- Indicated for Low count sperms, Endometriosis, cervical factor infertility
- successful in 15-20% of cases

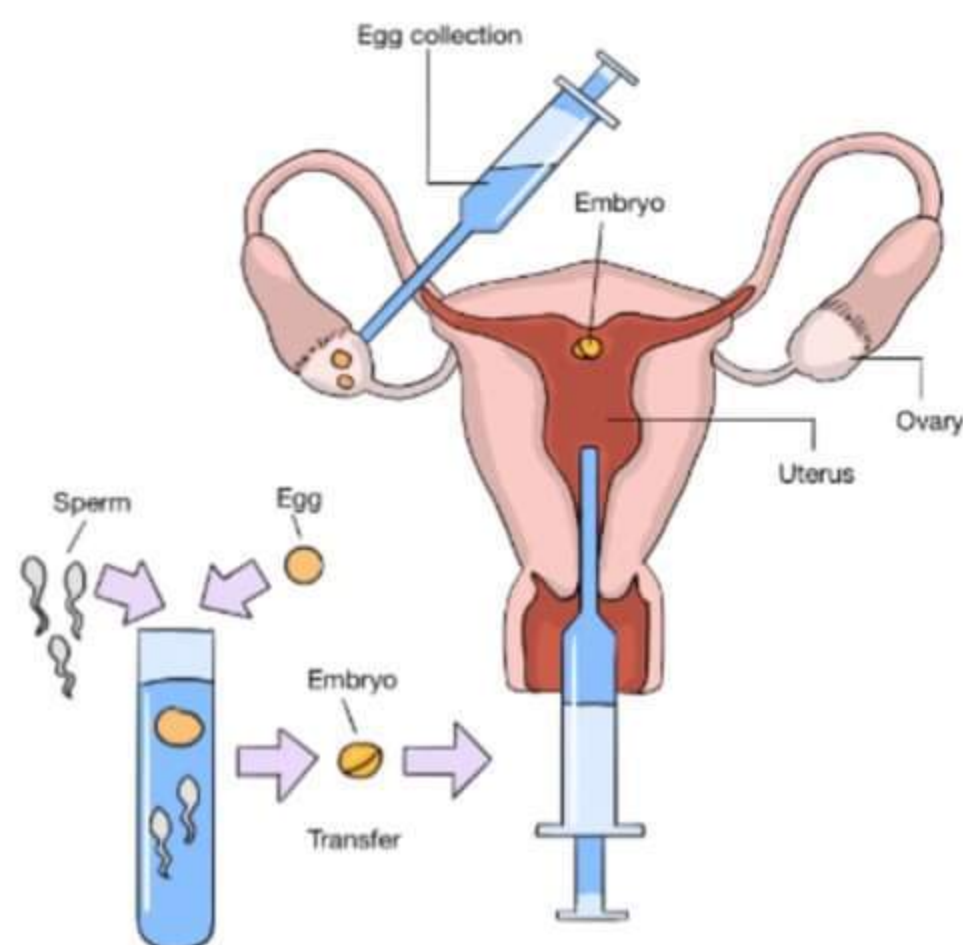
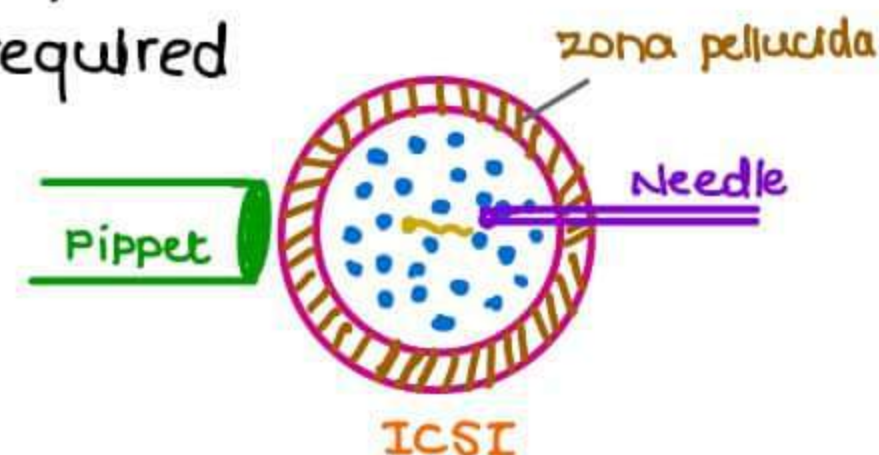
3 IN VITRO FERTILIZATION

- Indicated for tubal blockage, Low count sperms, Endometriosis, Cervical factor infertility
- 2 or 3 Day 3 [8 cell] embryos are transferred or 1 or 2 Day 5 [Blastocysts] embryos are transferred
- Success rate → 40 - 45% [pregnancy]
Takehome baby rate → 25-30%.
- IN VIVO,
1/5th of Semen will reach the site of fertilizatⁿ
1 Lakh sperms collide w/ Ovum & release ACROSIN
Acrosin softens the ZONA PELLUCIDA → ACROSOME REACTION
Fertilizatⁿ occurs & followed by ZONA REACTⁿ, which hardens Zona again
- IVF requires 1 Lakh sperms to fertilize a oocyte
So, for IVF at least 3-5 million sperms required
for IUI at least 5-10 million sperms required

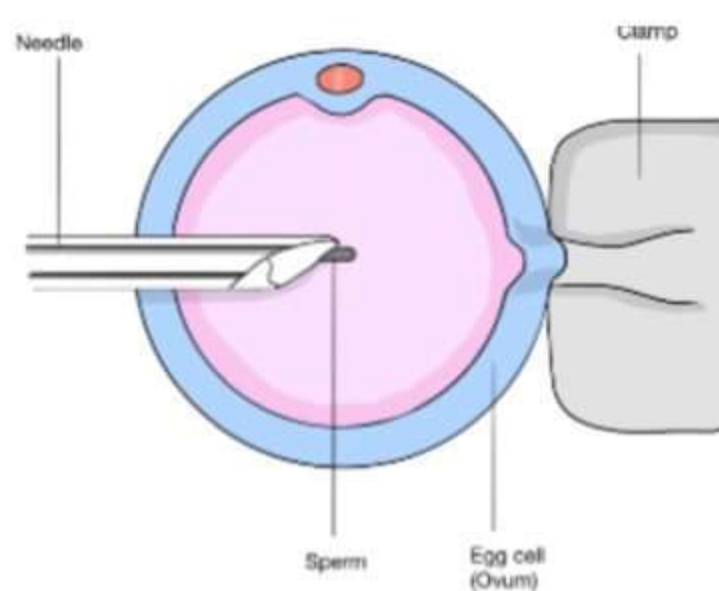


4 INTRA CYTOPLASMIC SPERM INJECTION

- Indicated for very very low sperm count



IN VITRO FERTILIZATION



INTRA CYTOPLASMIC SPERM INJECTION

AZOOSPERMIA [Obstructive Azospermia]

- Normal FSH & Azospermia → obstructive Azospermia
- SPERM EXTRACTION TECHNIQUES

PESA [Percutaneous Epididymal Sperm Aspiration]

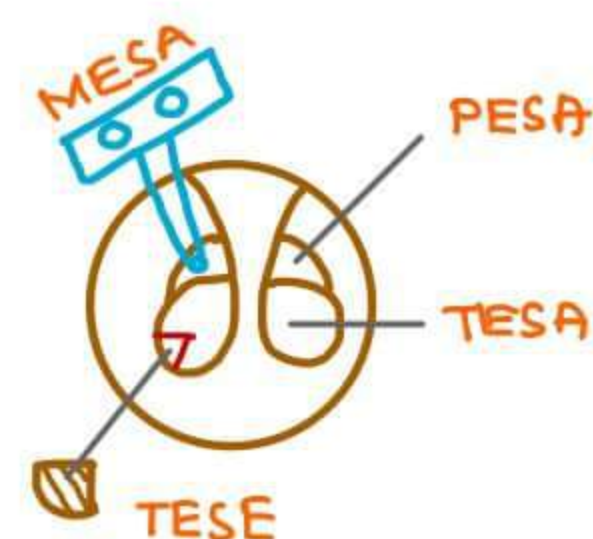
TESA [TESTicular Sperm Aspiration]

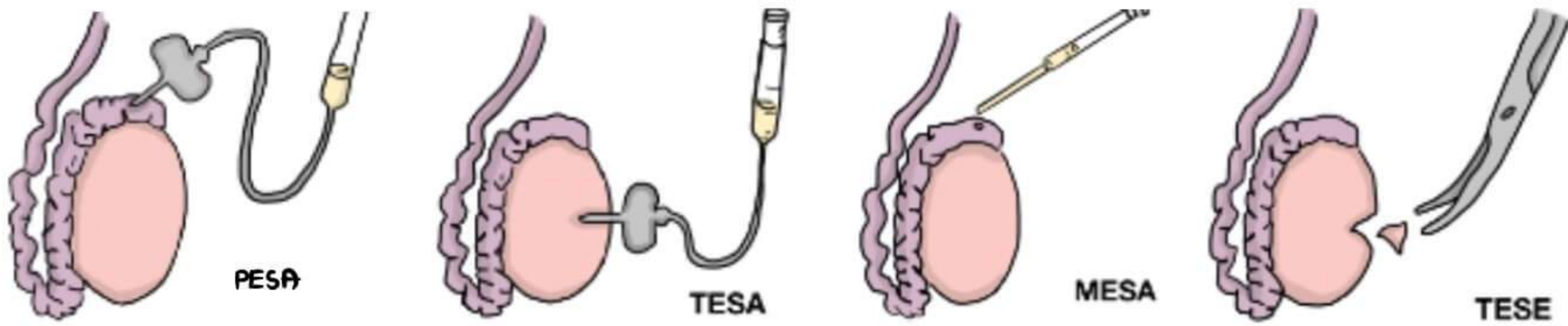
- Both can be done under Local anesthesia
- Both are simple techniques [Needle Aspiration]

MESA [Microsurgical Epididymal Sperm Aspiratⁿ]

TESE [TESTicular Sperm Extractⁿ]

- Both are done under GA
- Both are complicated techniques





Q Best technique to get quality sperms ?

- A PESA
- B TESA
- C MESA
- D TESE

Q controlled ovarian Hyperstimulatⁿ was given for IVF
Pre trigger [HCG], Estradiol levels \rightarrow 800 pg
What is the next step in management

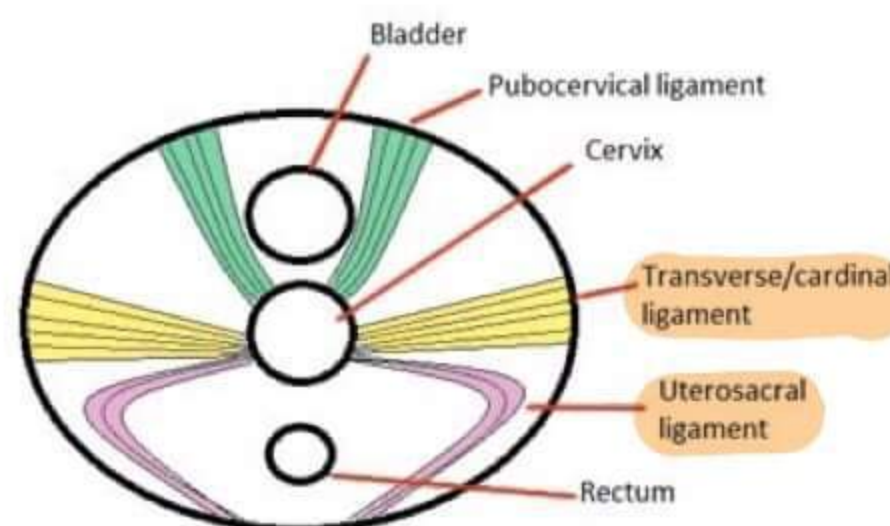
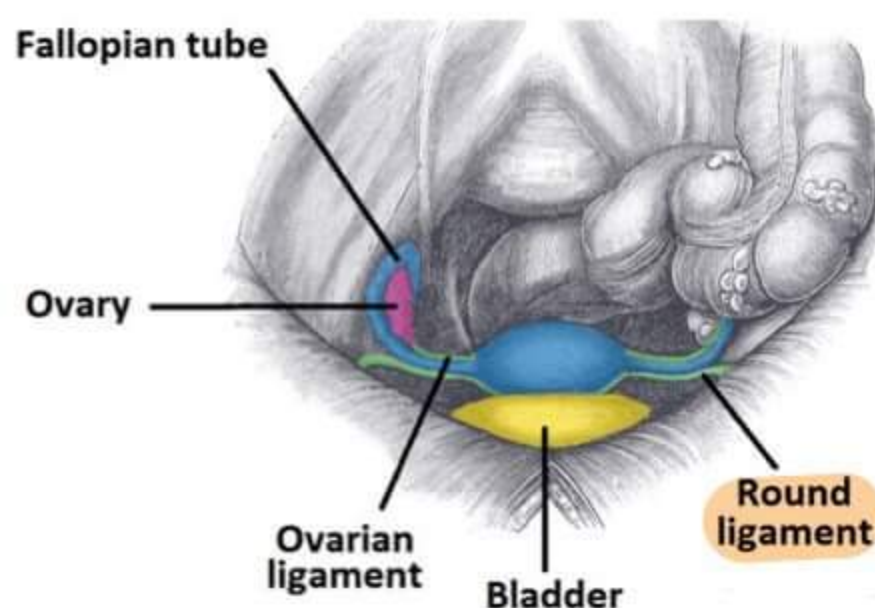
- A cancel the cycle
- B continue stimulatⁿ for 1 to 2 days & check estradiol

\rightarrow IDEAL TEMPERATURE FOR SPERMATOGENESIS \rightarrow 35 - 35.5°C

GENITAL PROLAPSE

SUPPORTS OF UTERUS

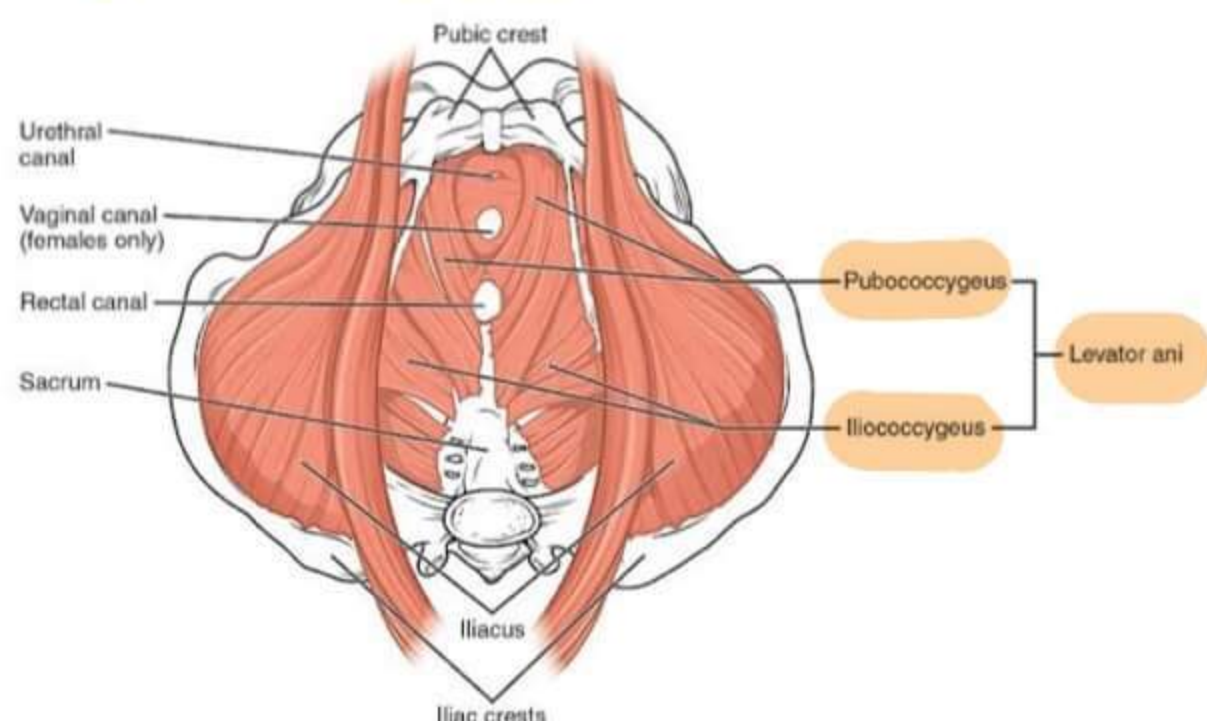
LIGAMENT SUPPORT



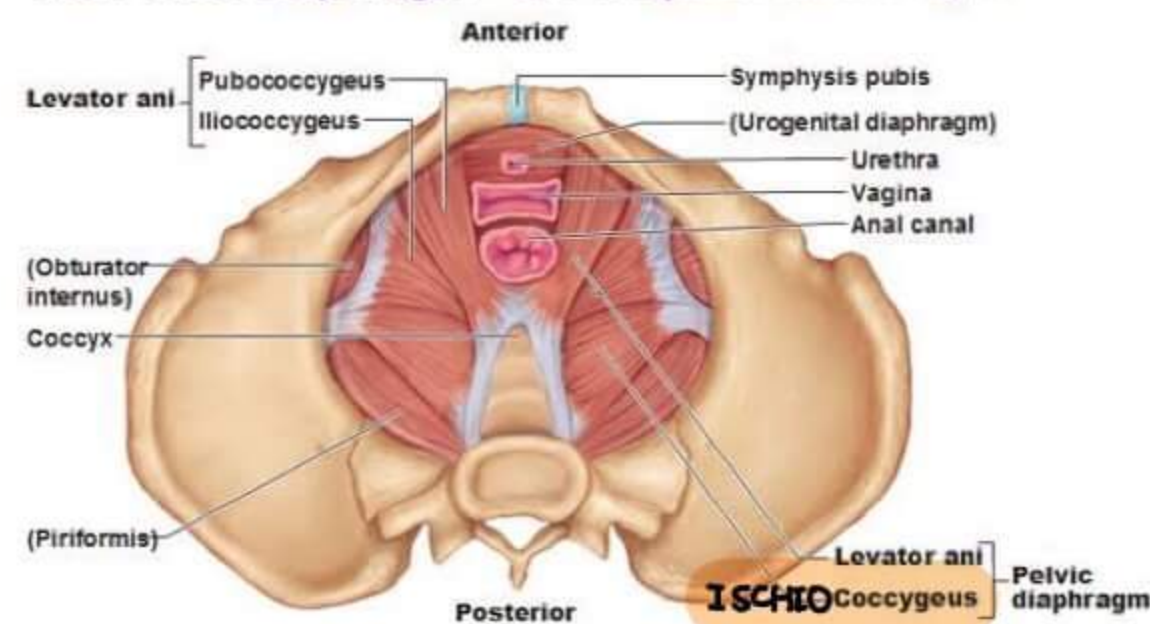
Mackenrod's ligament

← most important among ligaments

MUSCULAR SUPPORT



The Pelvic Diaphragm = the deepest muscle layer



→ Muscles are the best supports of the uterus

CAUSES

→ Abnormal conduct of labour → most important cause

Early bearing down
prolong 2nd stage
faulty instrumentatⁿ
early resumptⁿ of work
multiparity

→ connective tissue disorders

→ Spina bifida

→ ↑ abdominal pressure

ascites

chronic cough

abdominal mass

EARLY BEARING DOWN [against the partly dilated [3cm or 5cm] cervix]

→ Leads to cervical stretching/elongation & cervical descent

→ In PAROUS PROLAPSE, usually cervical elongatⁿ is present

PROLONGED 2ND STAGE OF LABOUR

→ in Primⁱ → ≈ 1hr ; Upper limit is 2hr

in multi → ≈ 1/2 hr ; Upper limit is 1hr

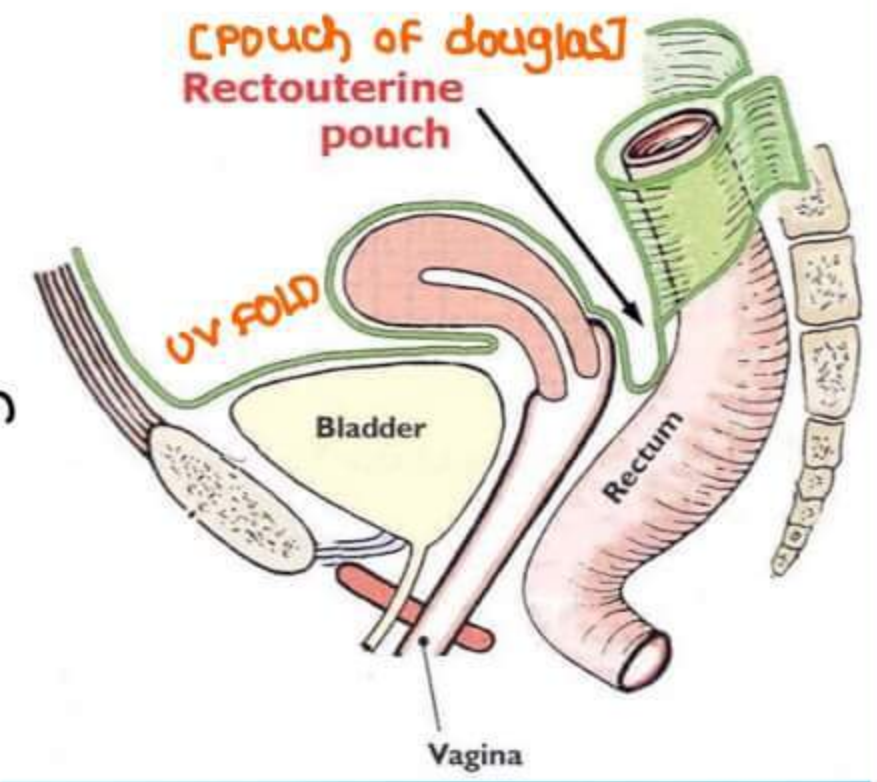
→ Ischemic damage of nerves causing Neuronal injury

- single most important injury predisposing to prolapse

FAULTY INSTRUMENTATION

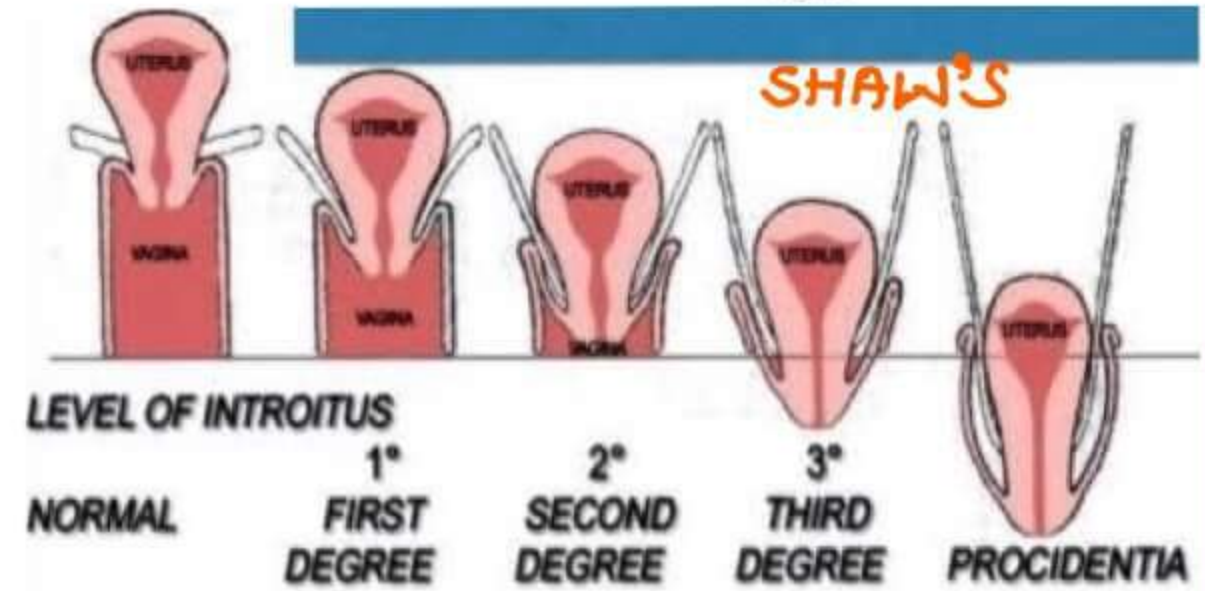
- Good instrumentatⁿ prevents prolapse
- Faulty instrumentatⁿ causes prolapse

EARLY RESUMPTION OF WORK → < 6 wks of puerperium



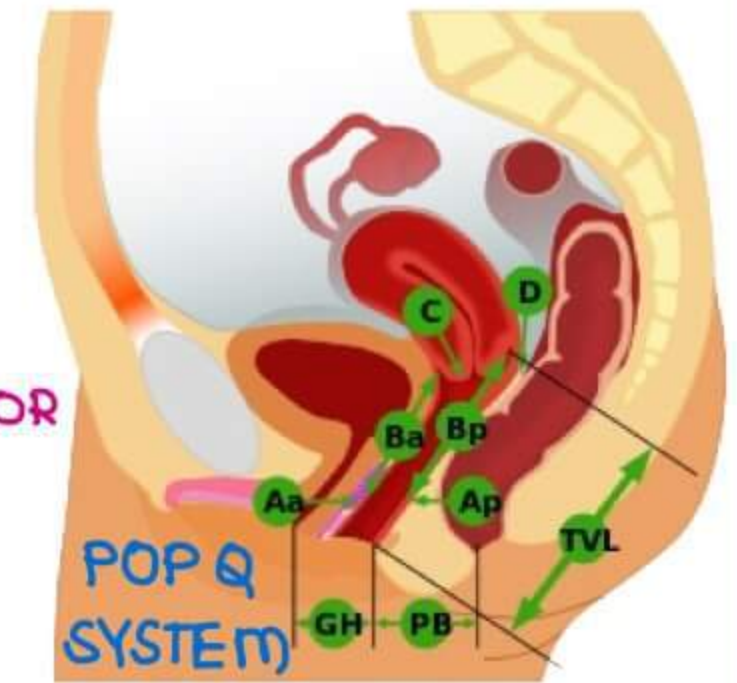
SHAW'S CLASSIFICATION

- STAGE I → cervix is just below the N level
- STAGE II → cervix is at introitus
- STAGE III → cervix is outside
- STAGE IV → PROCIDENTIA [full uterus has prolapsed]



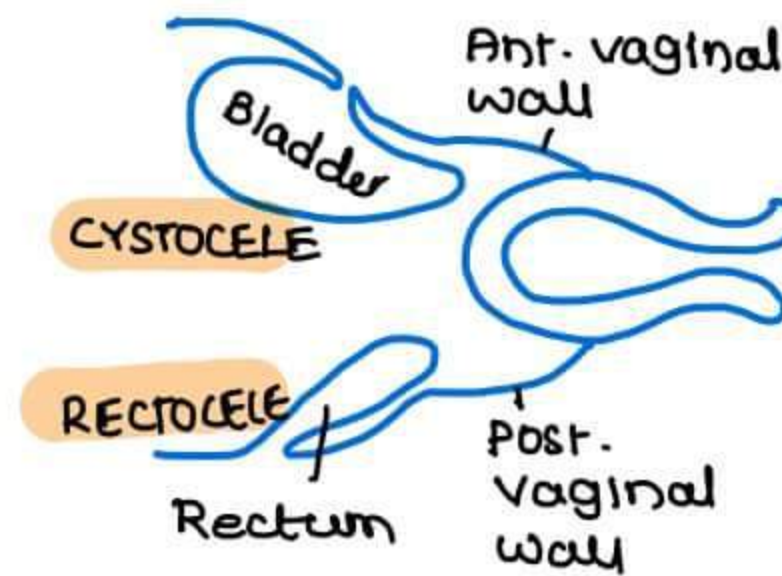
POP Q SYSTEM

- Pelvic Organ Prolapse Quantification System
- Reproducibility is good & good for comparison



PARTS OF PROLAPSE WHEN YOU GO FROM ANTERIOR TO POSTERIOR

- Anterior vaginal wall
- urethrocele
- Cystocele
- Uterus
- Rectocele
- Posterior vaginal wall



CYSTOCELE - COMPLICATIONS

- Difficult in initiatⁿ of micturition
- Retention of urine
- Infection
- Stone formatⁿ

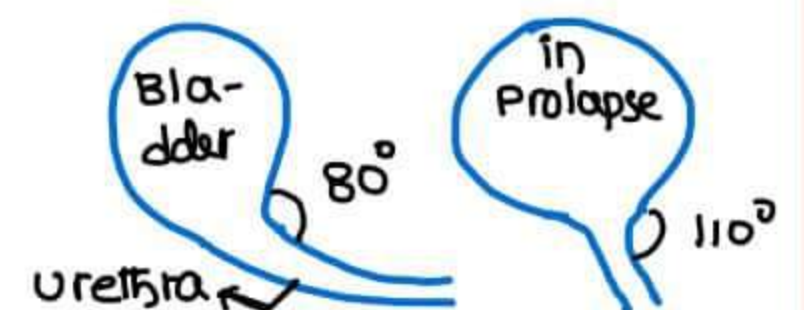
RECTOCELE - COMPLICATIONS

- difficult initiatⁿ
- fecolith formatⁿ



OTHER COMPLICATIONS

- Venous congestⁿ dit vaginal band → DEOXYGENATED UTERUS
- DECUBITOUS / DEPENDENT ULCER [dit venous congestⁿ]
- R_y → Repositioning \bar{z} Pessary
- STRESS URINARY INCONTINENCE
- Dragging sensatⁿ
- something coming out of vagina } mc presentatⁿ
- sense of insecurity in the vagina / Perineum



PREVENTION OF PROLAPSE

- Physiotherapy
 - antenatal
 - postnatal

TREATMENT

- Rx for elderly women [mc age group]

1 VAGINAL HYSTERECTOMY ± PELVIC FLOOR REPAIR

- aka WARD & MAYO'S OPERATION
- Hysterectomy done
- Repositioned bladder & rectum
- vault closure done
- Anterior colporrhaphy done
- Posterior colpo perineorrhaphy done } PELVIC FLOOR REPAIR

→ VAULT PROLAPSE

- present in 3-4 months of surgery of WARD & MAYO'S OPERATⁿ
- dlt pressure by enterocele through peritoneal defects
- mc cause → neglected enterocele
- Prevented by High ligatⁿ or closure of peritoneal defect
- Rx by SACROSPINOPEXY / SACROPEXY
 - Repositⁿ the vault physically
 - tie the vault to ischial spines or uterosacral ligament

→ STRESS URINARY INCONTINENCE

- present by 2-3 weeks of Sx [hysterectomy]
- dlt improper anterior wall repair

- Rx for younger women

FOTHERGIL REPAIR / MANCHESTER REPAIR

- Reposit the uterus
- DNC [Dilatation & curettage] to be done
- DO cervical amputatⁿ for the lax / elongated cervix
- ± Fothergil Stich, support the uterus ± Mackenrodt's ligament
- Pelvic floor repair done along ± Fothergil Stich
- Reposit the bladder & rectum
- Pioneered by DONALD in Manchester city Hospital

→ R_p for NULLIPAROUS PROLAPSE of very young women

SLING SURGERIES

- Tie a sling to the posterior part of cervix & pull in & tie inside
- SHIRODKAR SLING → tie to Anterior Longitudinal ligament
- KHANNA'S SLING → tie to Anterior Superior iliac spine
- PURANDARE'S SLING → rectus sheath

STRESS URINARY INCONTINENCE

- d/t improper anterior colporrhaphy
- can be a complication in 2-3 wks after hysterectomy

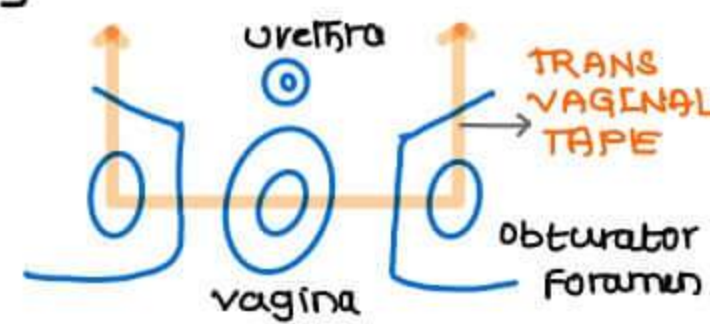
→ Surgical Management

- | | | |
|-------------|---|-------------------------------|
| 1 PEYRERA'S | } | - Needle suspension procedure |
| 2 STAMEY'S | | - Uplifting of urethra |

- | | | |
|--------------------------|---|--------------------------------|
| 3 MMK'S COLPO SUSPENSION | } | Uplifting of ant. vaginal wall |
| 4 BURCH COLPO SUSPENSION | | |

5 TRANS VAGINAL TAPE

6 KELLY'S STITCH



- Plicate the Paravesicle tissues under the bladder neck

→ BEST LONG LASTING RESULTS GIVEN BY COLPOSUSPENSION [upto 95%]

URINARY FISTULA IN OBSTETRICS

OBSTRUCTED LABOUR

- No progress of labour inspite of GOOD UTERINE CONTRACTIONS
- R_y by Cesarean Section
- In the case of ischemic injury to vagina & bladder
 - 5-7 days later, Vesico vaginal Fistula presents
 - Prevented by urinary catheterizatⁿ from 14-21 days

URINARY FISTULAS IN OBSTETRICS

CAUSES OF VESICO VAGINAL FISTULA

① OBSTETRIC CAUSES

- Obstructed labour
- Faulty instrumentatⁿ
- Destructive operations

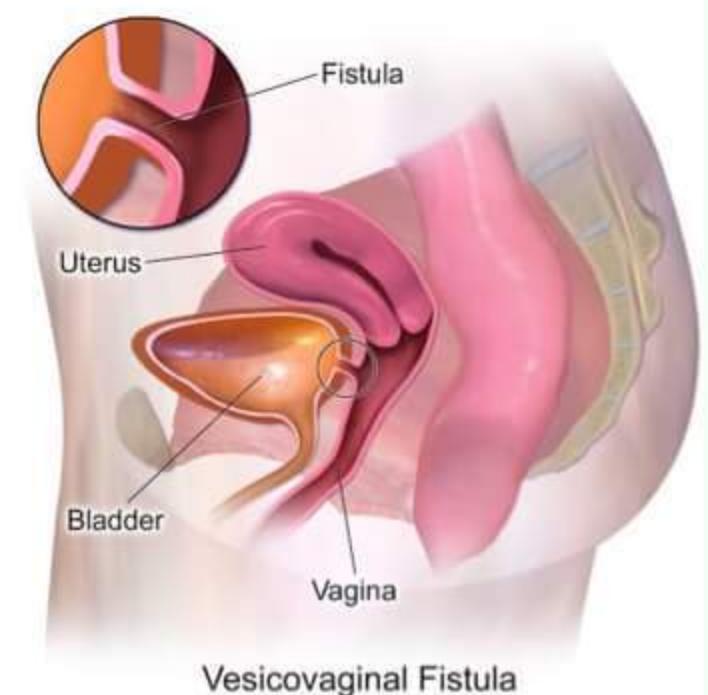
② GYNECOLOGICAL CAUSES

- Hysterectomy
- WERTHEIM → ureteric dissections

③ RADIATION INJURIES → painful fistula

PRESENTATION

- constant dribbling of urine
- Vulva & thighs are excoriated
- Splash dysuria
- UTI



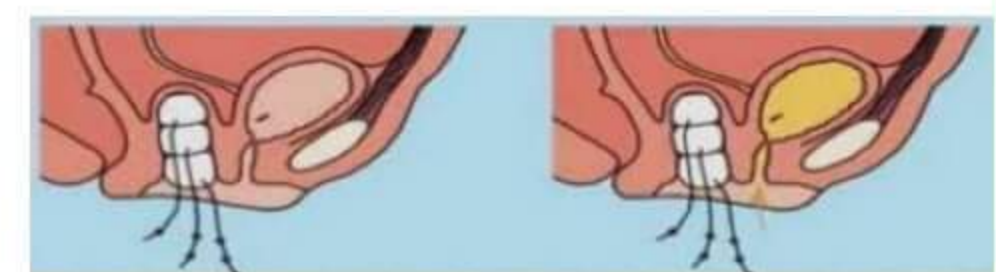
TREATMENT

- 1 DIVERT THE STREAM → i catheter
- 2 ZINC CREAM ON THIGH → work as Emollient
- 3 ANTIBIOTICS
- 4 REPAIR
 - Do not repair immediately
 - wait for scarring to happen
 - wait for 2 1/2 - 3 months

DIAGNOSIS

① 3 SWAB TEST

- Methylene blue is injected into the bladder



② Mid vaginal fistula

- mc in our country
- dit obstructed labour

⑥ HIGH VAGINAL FISTULA

- d/t forceps vaginal hysterectomy

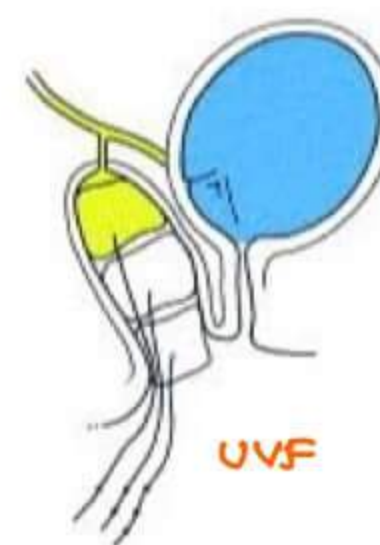
⑦ LOW VAGINAL FISTULA

- d/t urethro vaginal fistula or Low vaginal fistula d/t radiatⁿ injury

→ Destructive operations can cause any type of fistula

CASE → Top most cotton ball is not blue in color but it is colourless but WET

- urinary source is not bladder
- source is ureter → **URETERO VAGINAL FISTULA**
- Leaking + continence +nt



⑧ DOUBLE DYE TEST

- Cotton balls in vagina
- Methylene blue in the bladder
- Pyridium tablets given orally → impart RED colour to urine
- Helps to Dx Uretero vaginal fistula

③ Best diagnostic test for vesico vaginal fistula

→ **CYSTOSCOPY**

Best diagnostic test for uretero vaginal fistula

→ **INTRA VENOUS UROGRAPHY**

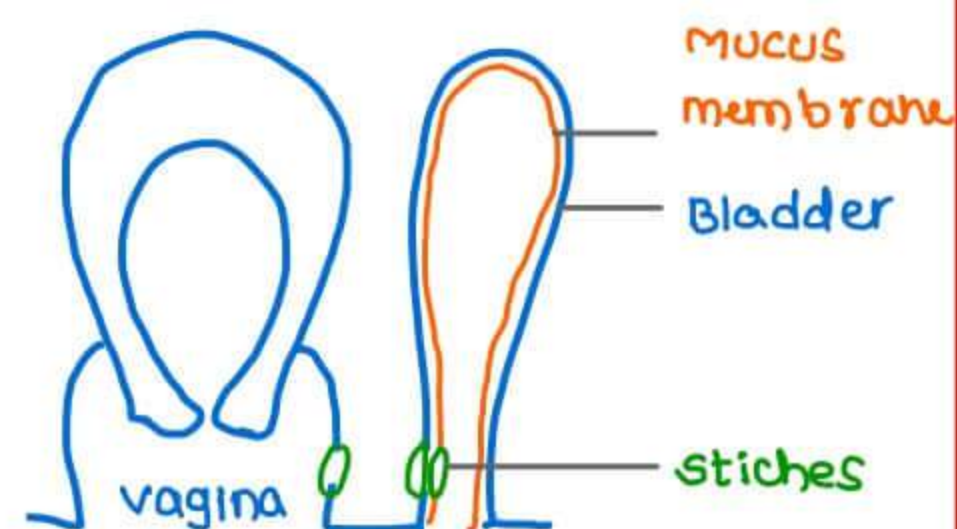
YUSSUF'S SYNDROME

- vesico uterine fistula
- presents w/ menorrhagia

REPAIR

① SIMS SAUCERIZATION FOR VVF

- done under general anaesthesia
- 3 circular stitches on
 - mucus membrane of bladder
 - Bladder
 - Vagina
- Done in **KNEE CHEST POSITION**



SIMS SAUCERIZATION

② LOW RECTO VAGINAL FISTULA REPAIR

- make it a complete Perineal Tear & repair

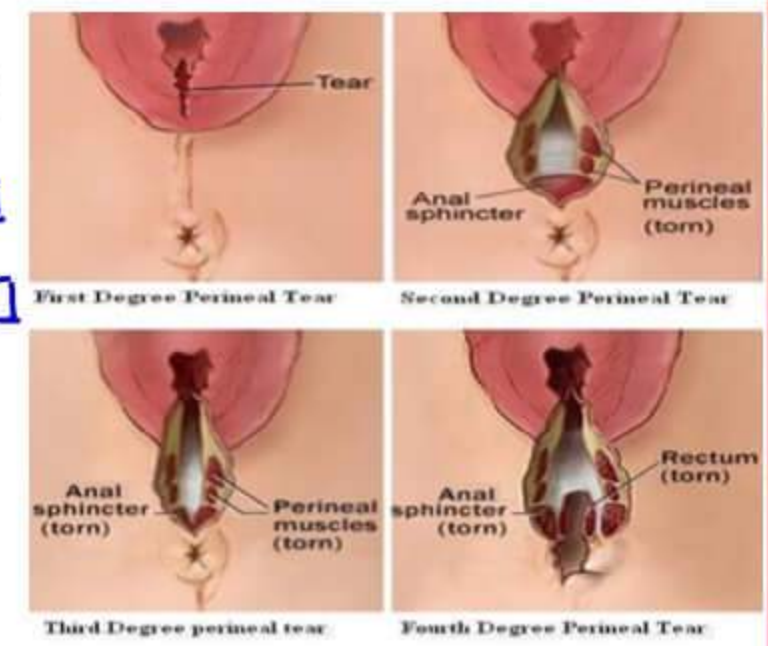
③ HIGH RECTO VAGINAL FISTULA REPAIR

- Divert the bowel → **Colostomy**
- Repair in layers

PERINEAL TEARS

- Mucosal layer tear of vagina
- mucosa + muscle tear
- mucosa + muscle + Anal tear
 - <50% External anal Sphincter tear
 - >50% External anal Sphincter tear
 - Internal anal Sphincter tear

- TYPE I
- TYPE II
- TYPE III
 - IIIa
 - IIIb
 - IIIc



- mucosa + muscle + Anus + Rectal tear → TYPE IV

COMPLETE PERINEAL TEAR

- TYPE III } COMPLETE PERINEAL TEAR → Repair immediately
- TYPE IV }

- After 24 hrs in a complete tear, there is colonizatⁿ of cut ends
- Will breakdown if repair
- wait for 2 1/2 - 3 months [at least 6 wks]

INTERCEPTION / EMERGENCY CONTRACEPTION / POST COITAL CONTRACEPTION

- Contraception within 72 hrs of unprotected intercourse
- implantation of embryo takes place during 6th day after intercourse. so, abortion cannot be done for these cases. Emergency contraceptives are preferred
- ABORTION IS NOT A METHOD OF EMERGENCY CONTRACEPTION

DRUGS USED IN EMERGENCY CONTRACEPTION**1. LEVONORGESTREL**

- contains Progesterone
- Dosage → 0.75 mg x 2 tablets
→ 1.5 mg of 1 tablet available now
- MOA
 1. ↓ LH → ↓ ovulation → NO pregnancy
 2. Progesterone → ↑↑ Endometrial secretion → TOO FLUFFY / OUT OF PHASE
ENDOMETRIUM → Difficult for embryo implantation
 3. Progesterone → ↓ tubal motility → Late arrival of embryo into
uterus → NO IMPLANTATION
- ↳ Thickening of cervical mucus [This mechanism CAN NOT used for emergency contraception as the sperms have already crossed the cervix after intercourse]

2. YUZPEE REGIME [COCP]

- 2 pills given at morning, after 12 hrs of time other 2 pills are given
- MOA
 - ↳ COCP reduces ovulation
 - ↳ COCP reduces chances of implantation by altering endometrium
- S/E → ↑ vomiting

3. MIFEPRISTONE / RU 486 / ANTI PROGESTIN

- MOA → reduces implantation
- Dosage → 10-50 mg for emergency contraception

4. ULIPRISTAL ACETATE

- selective progesterone receptor modulator [SPRM]
- Dosage → 30 mg, 1 tablet
- ELLA → Brand name
- Better than Levonorgestrel [as it is effective upto 5 days]
- Not the DOC of emergency contraception d/t non regular availability in India

5. INTRAUTERINE CONTRACEPTIVE DEVICE [IUCD]

- IUCD reduces implantation
- useful upto 5 days [uniformly effective]
- most effective method among emergency contraceptives, but not the best method as it requires insertion of device [not a comfortable procedure]

CRITERIA FOR DRUG OF CHOICE FOR EMERGENCY CONTRACEPTIVES

- over the counter available drug
- no prescription required
- Easy to use

Best method of emergency contraception → Levonorgestrel
 DOC of emergency contraception → Levonorgestrel
 Brand name of Levonorgestrel → i - PILL

TYPES OF ORAL CONTRACEPTIVE PILLS

1. MONOPHASIC PILLS

- Fixed dosage of Estrogen & Progesterone i good control of cyclicity but not i side effects
- Eq. oestrogen → upto 50 µg/day ; Progesterone → upto 1 mg/day

2. BIPHASIC PILLS

- Fixed amount of estrogen while the amount of Progesterone is increased after mid cycle
- Eq. oestrogen → constant
 Progesterone → 11 days at 50 µg, rest 10 days at 125 µg

3. TRIPHASIC PILLS

- amount of Progesterone is constantly increased in 3 phases, while amount of estrogen may be fixed or variable by increasing little and back to original dosage
- Eq. Estrogen → 30 µg / 40 µg / 30 µg
 Progesterone → 50 µg / 75 µg / 125 µg
- Triphasic pills are for better cyclic control & fewer side effects

LAPAROSCOPIC STERILIZATION

Laparoscopic sterilization done by using

1. LAPAROSCOPIC CLIPS

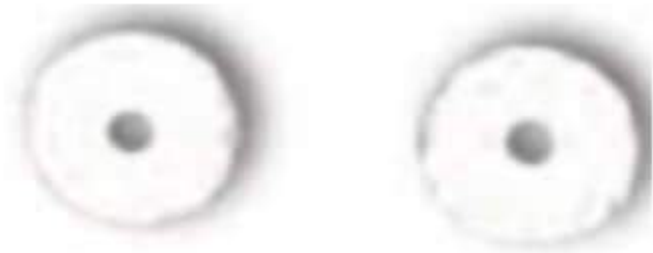


FILSCHE CLIPS (clips iout serrations)



HULKA CLEMENS CLIPS (clips i serrations)

2. LAPAROSCOPIC RINGS



FALLOPE RINGS

- FALLOPE RINGS are silastic rings that are forced over the tube using Laprocator
- Isthmus of fallopian tube is the area to be ligated for sterilization
- A loop is made at the fallopian tube [near isthmus] & falope ring are forced at the base of the loop. They provide tight grip & cause ischemic necrosis of fallopian tube instataneously & the loop fall off

3. CAUTERIZATION

- TYPES OF CAUTERY
 1. monopolar cautery
 2. Bipolar cautery
- Fallopear tube is held blw the prongs of cautery & high voltage current is passed which burn the tube at isthmus & also lateral side of tube [which makes it the last priority]
- not recommended now - a - days
- it has worst chances of reversibility

BEST RE-ANASTOMOSIS OF ANY TUBECTOMY PROCEDURE → LAPAROSCOPIC CLIPS

WORST RE-ANASTOMOSIS OF ANY TUBECTOMY PROCEDURE → CAUTERY

MONOPOLAR CAUTERY IS WORSE THAN BIPOLAR CAUTERY

BIPOLAR CAUTERY

- current goes from one prongs to the fallopian tube & goes to the other prong & goes back to machine [generating to current]

MONOPOLAR CAUTERY

- current flows through the instrument into the fallopear tube & into the earthing attached to patient
- current dissipation is more in monopolar cautery

IUCDS [intra uterine contraceptive devices]

- FUNCTION
 - to induce Foreign body action
 - uterus will contract to expel the FB [IUCB], thus the FB action will expel the embryo
- 1st Generation IUCD → LIPPES LOOP [Inert]
- 2nd Generation IUCD → COPPER DEVICES [multiload]
- 3rd Generation IUCD → PROGESTERONE CONTAINING IUCDS

COPPER DEVICES | 2nd GENERATION IUCDs | CU 380 A

- A → Arms [contain copper]
- 380 → amount of Cu in CU 380 A → 380 mm²
- Gold / silver is impregnated w copper
- can be used upto 10 yrs



CU 380 A

MOA

- Foreign body action & Aseptic inflammation of endometrium causing reduced chance of implantation & reduction of sperm motility & fertilization, sperm destruction

HORMONE CONTAINING IUCDS | 3rd GENERATION IUCDS

1. PROGESTASERT

- contains 38 mg Progesterone
- 65 µg of progesterone is released per day
- can be used for 18 months

MOA

- Foreign Body action to prevent pregnancy
- cervical mucus thickening [major action]
- Non receptive endometrium [↑ progesterone causes atrophic endometrium]
- Anovulation [40% of patients only]

2. LEVONORGESTREL CONTAINING IUC DEVICES [MIRENA]

- contains 52 mg of progesterone
- 20 µg of progesterone is released per day
- can be used upto 5 years

USES

- contraception
- ↑ bleeding control

MOA

- Foreign Body action to prevent pregnancy
- cervical mucus thickening
- Non receptive endometrium [major action]
- Anovulation

SIDE EFFECTS OF IUCD

1. Bleeding

- mc side effect [3 times more common than pain]
- Tranexamic acid & NSAIDs are given for 1st 3 cycles during periods
- Best time of insertion of IUCD → within last days of periods

2. Pain [2nd mc SIE]

3. Infection

4. PID's [should be ruled out before inserting IUCDs]

5. Perforation [rare]

ECTOPIC PREGNANCY & IUCDS

- CHANCE OF ECTOPIC PREGNANCY IF A NORMAL WOMEN CONCEIVES → 1-2%.
- % OF TYPE OF PREGNANCY IF A WOMEN \bar{I} IUCD CONCEIVES
 - a. Intra uterine pregnancy → 95-96%
 - b. Ectopic pregnancy → 4-5%
- CATCH POINT
 - incidence of pregnancy is less for women \bar{I} IUCD when compared \bar{I} \textcircled{N} women
 - therefore, incidence of ectopic pregnancy is also less for women \bar{I} IUCD when compared to \textcircled{N} women \bar{I} out IUCD
- IF a women \bar{I} IUCD is pregnant → Rule out Ectopic pregnancy

MANAGEMENT OF IUCD \bar{I} PREGNANCY

1. REMOVE IUCD → IUCD + Pregnancy → > 50% chances of abortion

2. MANAGE AS PATIENTS WISH

Wants to continue pregnancy
↓
continue pregnancy

does not wants to continue pregnancy
↓
offer medical termination of pregnancy

3. IF THREAD NOT SEEN i.e. IUCD CAN NOT BE REMOVED

Wants to continue pregnancy
↓
continue pregnancy \bar{I} IUCD with
advise of risk of abortion being 50%
& risk of premature rupture of membranes
Anomalies can not happened \bar{I} IUCD

does not wants to continue pregnancy
↓
offer medical terminatⁿ of pregnancy

4. MISSING IUCD

- Advise patient that IUCD will expel spontaneously & ask them to feel for IUCD thread over vagina for the 1st 3 cycles.
- IF she cannot feel for thread, in OPD, IUCD is removed \bar{I} the help of IUCD hook
- Even if IUCD can not be removed using hook, use ultrasound | X-Ray of pelvis to locate IUCD.
- some times, IF IUCD is perforated,
 - ↳ First AP view of X-Ray is preferred to check whether IUCD is inside the body of patient.
 - ↳ if IUCD present, then do lateral view of X-Ray to see whether IUCD is inside the uterus / outside the uterus

CONTRAINDICATIONS OF IUCDS

1. Pregnancy
2. Puerperal Sepsis
3. STD / PID
4. undiagnosed vaginal bleeding
5. uterine anomalies
6. cancer of cervix
7. cancer of uterus

IMPLANTS

- Progesterone containing devices
- SUB DERMAL IMPLANTS
 - ↳ inserted into arm of women
 - ↳ very good control as contraceptive
 - ↳ failure rate of implants is very low even when compared to vasectomy & tubectomy



SUB DERMAL IMPLANTS

NORPLANT

- contains 36 mg of Progesterone & 6 rods [total → 216 mg of Progesterone]
- can be used for 5 years

NORPLANT II | JADELLE

- contains only 2 rods → Lesser discomfort for patients
- contains 75 mg x 2 → 150 mg of Progesterone
- can be used for 3 years
- should be removed after 3 years surgically under Local anesthesia

IMPLANON

- contains 68 mg of Etonogestrel
- Etonogestrel is biological metabolite of Desogestrel
- can be used for 3 years
- has only one rod [less discomfort]
- easy insertion & easy removal

NEXPLANON

- Advance of implanon
- has Barium Sulphate coated arm
- Localization can be easier

COMMON SIDE EFFECTS OF IMPLANTS

- | | |
|---------------|----------------------------|
| → Headache | → Irregular bleeding |
| → Weight gain | → Breast pain |
| → vaginitis | → Abdominal fullness, pain |

COMMON SIE OF IMPLANTS → BREAK THROUGH BLEEDING**NUVA RING | VAGINAL RING**

- contain Etonogestrel + Ethynyl Estradiol
- can be inserted just before intercourse
- Etonogestrel → 0.120 mg/day
- Ethynyl Estradiol → 0.015 mg/day } are released through the ring
- works for 3 weeks
- After removal, within a gap of 1 week, women will get her periods & then reinsertion can be done
- conveniently used as they don't have to remember



NUVA RING

SPONGE | TODAY

- can be inserted first before intercourse into vagina
- works for 24 hrs
- contain Nonoxynol - 9 [spermicidal]
- has band attached to it which makes it easy for removal



Sponge | today

INJECTABLE PROGESTERONE

1. DMPA [DEPOT MEDROXYPROGESTERONE ACETATE]

- contains 150 mg of Progesterone
- Given once in 3 months

2. NET-EN [NOR ETHISTERONE ENANTHATE]

- contains 200 µg of Progesterone
- given once in 2 months.

MOA OF DMPA & NET-EN

continuous injection OF DMPA & NET-EN



Endometrium becomes atrophic



Reduces implantation
increases cervical mucus thickening
causes anovulation

EVRA PATCH

- size of 4 cm approx. applied over the arm, abdomen
- contains E. Estradiol & Norelgestromin
- Ethynyl Estradiol of 20 µg & Norelgestromin of 150 µg per day are released
- has to be changed every week & the 4th week is given as break & patient will have periods

BARRIER

- most convenient contraceptives
- Eg. condoms, Diaphragms

CONDOMS

- not used as ideal method all the time
- conveniently used for people having multiple partners
- interferes w/ pleasures
- high failure rate

DIAPHRAGM / DUTCH CAP

- convex part is facing outside ; hollow part fixes into the cervix
- always used w/ spermicidal cream/ jelly [nonoxynol-9]
- can be used during intercourse
- for best effectivity → insert atleast 4 hrs prior to intercourse
- should be removed within 6 hrs of intercourse
- if not removed → Toxic shock Syndrome [dlt Staph. aureus (mc), Streptococcus [rarely] may occur

NATURAL METHODS OF PREVENTING PREGNANCIES

1. ABSTINENCE [no sex]

2. WITHDRAWAL TECHNIQUE

- pulling out before ejaculation
- DISADVANTAGES
 - ↳ pre - ejaculate can have sperms that can lead to pregnancy
 - ↳ high failure rate

3. RHYTHM METHOD / FERTILE PERIOD METHOD / SAFE PERIOD METHOD / CALENDAR METHOD

4. CERVICAL MUCUS METHOD / BILLING'S METHOD

- Thin cervical mucus / wet days → avoid intercourse
- Dry days [cervical mucus thick, very little] → can have intercourse

5. BASED ON BASAL BODY TEMPERATURE

- Progesterone is a thermogenic hormone
- After ovulation, Progesterone cause rise in temperature by 0.5° F
- This alarms when to avoid intercourse w partner
- ↑ Failure rates → require lot of commitment & accuracy is less
- Pearl index → 60/100 women years

PEARL INDEX [Failure rates are described]

$$\text{PEARL INDEX} = \frac{\text{Total no. of accidental pregnancies}}{\text{Total months of exposure}} \times 1200$$

METHODS OF CONTRACEPTION	PEARL INDEX
IMPLANTS	0.05
VASECTOMY	0.1
TUBECTOMY	0.2
IUCD	0.5
COCP	0.5 - 0.6
LEVONORGESTREL	0.2
POP	1 - 2
BARRIERS [CONDOMES]	
→ Ideal usage	9
→ Typical usage	14 - 21

LONG ACTING REVERSIBLE CONTRACEPTIVES [LARCs]

- Levonorgestrel
- Implant
- Now - a - days, these are preferred over permanent sterilization procedures

BARRIERS

- For making barriers more effective, spermicidal jellies are used

PROPER CONDOM USAGE

- should be used on fully erect penis
- Reservoir not to be pushed over the glans & not to be checked for patency
- After intercourse, withdraw penis in fully erect state

IN FOLLOW UP OF MOLAR PREGNANCY

- should not conceive for next 6 months atleast
- HCG from pregnancy & HCG from trophoblastic disease will be hard to differentiate. so, contraceptives are given for 6 months
- contraceptive of choice
 - combined oral contraceptives
 - IUCDs not used as they can cause perforatⁿ

FOR PATIENTS WITH HEART DISEASE

- IUCDs are used [shorter threads]
 - ↳ monofilaments are used now
 - ↳ polyfilaments used earlier [↑ risk of ascending infection]
- COCP, POP are not given [cause water retention]

FOR DIABETIC PATIENTS

- COCP
- IUCDs [preferred]

IN UNCONTROLLED DIABETES

- contraceptives can't be used
 - ↳ BOTH Estrogen & Sugars are metabolized in liver
 - ↳ ↑ sugar levels can disturb contraceptive usage
- Barriers with spermicidal jellies are preferred

IN STDs | HIV PATIENTS

- Barriers with spermicidal jellies are preferred
- double barrier → both partner to wear condoms

FOR NEWLY MARRIED COUPLE → COCP**FOR COUPLES STAYING IN DIFFERENT CITIES**

- Barriers, emergency contraceptives, COCPs are not preferred
- IUCDs [fill it, forget it] are most preferred

FOR POST NATAL / LACTATIONAL AMENORRHEA [within 6 wks of delivery]

- COCPs are not preferred as they can cause lactational failure
 - ↳ Estrogen will cause glandular proliferatⁿ → block lactiferous ducts]
- Progesterone only pills are preferred
- Patients after 6 wks of delivery → IUCD is preferred
- **UNSAFE BELIEF → LACTATION ITSELF IS PROTECTION AGAINST PREGNANCY**
 - ↳ Prolactin → inhibits GnRH → FSH & LH not released → no ovulation
 - ↳ But continuous breastfeeding can only prevent ovulation, which is not possible

POST PLACENTAL IUCD

- IUCD inserted in uterus after removal of placenta during delivery
- During uterus contractⁿ after delivery [uterus involution], it may expel copper out.
- But the expulsion rate is not found to be > 12%. [WHO]

ASHERMAN SYNDROME**ETIOLOGY**

1. **OVERZEALOUS CURETTAGE** done for
 - AUB (Abnormal uterine bleeding)
 - MTP
 - 2° PPH [dit retained bits of placenta]
 - causes scarring & fibrosis of endometrium [no gland development further]
 - leads to 2° amenorrhea → ASHERMAN SYNDROME
2. **ENDOMETRIAL TB** → also causes ASHERMAN SYNDROME

CURETTAGE DONE FOR 2° PPH IS MORE LIKELY TO CAUSE ASHERMAN SYNDROME

TREATMENT

1. Hysteroscopic Adhesiolysis
2. Follow \bar{c} High Dose Estrogens & Progestones

TUBERCULAR PID

→ Incidence → 20-25% of women in India

PATHOGENESIS

- Endometritis → Menorrhagia [initially]
 - ↓
 - Endometrial destructⁿ
 - ↓
 - ASHERMAN SYNDROME → oligomenorrhea
Hypomenorrhea
Amenorrhea [mc]
- Fallopian Tube
 - ↳ calcific, beaded, rigid tube
 - ↳ Hydrosalpinx → TOBACCO POUCH HYDROSALPINX
 - ↳ RETORT SHAPED HYDROSALPINX

TREATMENT

- 4 drugs for 2 months &
- 3 drugs for 4 months
- Do not stop the Rx in 1st trimester

PELVIC INFLAMMATORY DISEASE

CAUSES

- Chlamydia → most prevalent ; Indolent
- Gonorrhoea → most common in OPD
- Mycoplasma
- TB
- Ureaplasma
- Bacteroides
- Pepto streptococcus
- Bacterial vaginosis [important cause]
- Streptococcus

CLINICAL FEATURES

SYMPTOMS

- Pain abdomen
- Congestive dysmenorrhoea
- Dyspareunia
- Fever

SIGNS

- Febrile
 - ↳ ADMIT IF
 - Temp $> 38^{\circ}\text{C} / 100.4^{\circ}\text{F}$
 - Severe symptoms
 - Suspicious pelvic abscess
 - Unreliable
 - Uncertain diagnosis
 - ↑ CRP
 - Leucocytosis
 - On P/V
 - ↳ cervical motⁿ tenderness
 - ↳ Uterine tenderness
 - ↳ Adnexal tenderness
- } CLINICAL TRIAD
helps in diagnosis

CERVICAL MOTION TENDERNESS ALSO BE SEEN IN RUPTURED ECTOPIC PREGNANCY

DIAGNOSIS

ADDITIONAL CRITERIA

1. CULTURE & SENSITIVITY OF

- Endometrial Biopsy
- vaginal swab
- cervical swab

→ CULTURE MEDIAS FOR

- | | |
|--------------|----------------------------------|
| 1. GONORRHEA | → Thayer martin media |
| 2. CHLAMYDIA | McCoy cell lines [PCR Preferred] |

- 2. ↑ ESR / CRP
- 3. ↑ TLC
- 4. FEVER > 100.4° F [38°c]

ELABORATE CRITERIA

- 5. DIAGNOSTIC LAPAROSCOPY
 - gives direct evidence
 - Laparoscopy "IF DONE" is the best way to diagnose PID
- 6. USG → documents Pelvic / tubo ovarian abscess

DISCHARGE CRITERIA → Temperature < 99.5° F

TREATMENT

- CENTRE FOR DISEASE CONTROL OF ATLANTA
 - INPATIENT REGIMES
 - OUTPATIENT REGIMES

→ Broad spectrum antibiotics

OPD REGIME

- CEFOXITINE 2gm iv or
CEFOTAXIME 1gm iv } 1 shot for gonorrhoea
- DOXYCYCLINE 100gm BD x 14 days → for chlamydia
- METRONIDAZOLE 500mg BD x 14Days → for anaerobes
for Bacterial vaginosis
- AZITHROMYCIN can be given instead OF DOXYCYCLINE
- CLINDAMYCIN can be given instead OF METRONIDAZOLE

VAGINITIS

PH OF vagina	→ 4.5 [candidiasis can occur in acidic pH]
Bacterial vaginosis	} can occur in Alkaline PH [>7] Alkalinity shift also predispose [5.5 or 6...]
Trichomoniasis	

AMSEL'S CRITERIA

- useful in Dx of Bacterial vaginosis
- ≥ 3 out of 4 are required
 - 1 creamy discharge
 - 2 WHIFF TEST ⊕
 - 3 Fishy odour
 - 4 CLUE CELLS

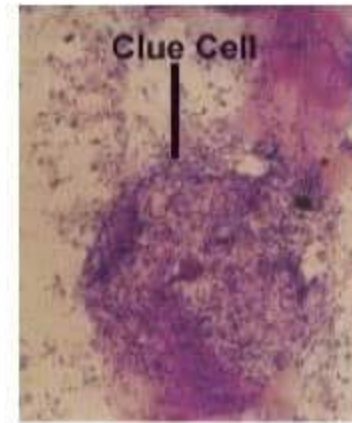
- DIMORPHIC FUNGI
 - Blastospores [spread]
 - Mycelia [invasⁿ & adhesion]
- curdy white discharge
 - plaques on vaginal wall
 - on removal → Petechiae

- out of proportⁿ PRURITIS
- complicated / uncomplicated
 - uncomplicated
 - seen in (N) women
 - Good prognosis
 - a/w albicans
 - complicated
 - in immunocompromised [in DM, TB, pregnancy etc]
 - Recurrent, Severe
 - a/w non-albicans

- TREATMENT
 - AZOLES
 - Oral FLUCONAZOLE
 - Rx both ♂ & ♀

- Hemophilus vaginalis
 - aka Gardenella vaginalis
- creamy discharge
- WHIFF TEST → +ve
 - Secretⁿ + 10% KOH → amines

- Fishy odour
- CLUE CELLS - vaginal epithelium embedded bacteria



- NO PRURITIS

- TREATMENT
 - METRONIDAZOLE
 - Rx the women [no sexual transmission]

- by Trichomonas vaginalis
 - flagellate protozoan
 - motile organism
 - causes severe irritatⁿ
 - causes Severe pruritis
- COLPITIS MACULARIS [STRAWBERRY VAGINA]
- Greenish yellow, frothy discharge

- TREATMENT
 - METRONIDAZOLE
 - Rx both man & woman

→ MC VAGINITIS → BACTERIAL VAGINOSIS

BACTERIAL VAGINOSIS can cause

- PID
- Relapse of PID
- chorioamnionitis [PID in pregnancy] → Abortion
- vault cellulitis
- IU Death
- Puerperal sepsis

→ WHIFF TEST CAN ALSO BE POSITIVE IN TRICHOMONIASIS

- AS both Bacterial vaginosis & Trichomoniasis CO-EXISTS
- classical for Bacterial vaginosis

- Rx the male partner also in Trichomoniasis
- Rx the male partner also in candidiasis