OB/GYN

MEDICINE

OBGYN Review File (Final)

References

- Doctors' slides and notes
- Kaplan notes
- 435 teamwork
- meded video

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Anatomy of female pelvic

Female External Genitalia (vulva)

Bartholin glands

- lies on each side of the vagina, in the posterior lower third 1/3 of the introitus.
- Secrete mucus –alkaline
- **Bartholin cyst**: when the orifice of the Bartholin duct becomes obstructed. **Management :** is conservative unless pressure symptoms occur due to size.
- **Bartholin abscess:** it may occur due to infection (mostly caused by E. coli and anaerobic Bacteroidesspecies, and seldom due to gonococcus). **Management**: Outpatient treatment is I&D with placement of a Word catheter under local anesthesia

Internal reproductive Organs

Vagina

- In vagina only know the epithelium and acidity.
- The covering epithelium of vagina is non-keratinized squamous epithelium, it's tough which lead to the acidity
- The vagina is acidic. It has low PH= 4.5, so it's very difficult to get bacterial infections.

Supports of cervix and uterus

- Cardinal ligaments: if this ligament is affected then it will lead to uterine prolapse
- Pubocervical ligaments
- Uterosacral ligaments

Episiotomy Indications:

- fetal weight greater than 4kg
- operative delivery
- shoulder dystocia
- Crowning of fetal head

Fetal Circulation

- The umbilical vein, carrying oxygenated blood from the placenta to the fetal body through the ductus venosus, which directly enters the inferior vena cava
- IVC → crista dividens → right atrium → foramen ovale → left atrium → left ventricle → ascending aorta → brain , heart and upper limbs
- SVC + IVC → right ventricle → ductus arteriosus → descending aorta → viscera and lower limbs
- Ductus arteriosus: shunts mildly oxygenated blood from pulmonary artery to descending aorta
- Ductus venosus: shunts highly oxygenated blood from umbilical vein to the IVC , so this structure carries oxygen to fetal organs)

Embryology of the Female Genital Organ

- Gonads: The gonads develop from the mesothelium on the genital ridge
- Uterus & Fallopian Tubes: Fusion of the two PMN ducts (mullerian ducts)
- Vagina: The upper 2/3 of the vagina formed by mullerian tubercle. The lower 1/3 formed by urogenital sinus

Congenital Malformations of the Female Genital Tract

- 45XO embryo the ovaries develop but undergo atresia → streak ovaries
- Mullerian Agenesis: Failure of mullerian duct development → absence of the upper vagina, cervix and uterus. ovaries are present because ovaries don't develop from Mullerian ducts)

Intersexuality

Congenital Adrenal Hyperplasia (CAH): Deficiencies of various enzymes required for cortisol & aldosterone biosynthesis (21-hydroxylase). female may present at birth with ambiguous genitalia. You will find 17-α-hydroxyprogesterone ↑. Tx: Cortisol.

Physiology of menstrual cycle

Menstrual cycle occurs with the maturation of the Hypothalamic pituitary ovarian axis. The hormones produced include gonadotropin-releasing hormone (GnRH) from the hypothalamus, which stimulates follicle-stimulating hormone (FSH) and luteinizing hormone (LH) from the anterior pituitary, which stimulates estrogen and progesterone from the ovarian follicle.

- **Ovary**: functional & morphologic changes resulting in follicular maturation, ovulation and corpus luteum formation.
- **Endometrium :** functional and morphologic changes, either to prepare it for conception or shedding of the menstrual endometrium.
- **FSH:** stimulates the growth of granulosa cells and induces the aromatase enzyme that converts androgens to estrogens.
- **LH:** stimulates the production of androgens by the theca cells, which then get converted to estrogens in the granulosa cells by the aromatase enzyme. The LH surge, stimulates synthesis of prostaglandins to enhance follicle rupture and ovulation. LH increases in the pre-ovulatory period.

	Phases of menstrual cycle
Menstrual phase	Due to strong vasoconstriction and proteolytic activity, functional stratum of endometrial tissue dies and is discharged during menstrual bleeding
Follicular phase	Due to the rise of follicle stimulating hormone (FSH) during the first days of the cycle, several ovarian follicles are stimulated
Ovulation	Most important event: LH surge surge=sudden increase. LH increases in the preovulatory stage
Luteal phase	High levels of Estrogen and Progesterone suppress production of FSH and LH that the corpus luteum needs to maintain itself.

Physiological changes in pregnancy

hematological changes:

- pregnancy is hypercoagulable state , so More risk for DVTs and PEs.
- Minimal normal Hb level for pregnant women is 10g/dl.
- physiological systolic **murmur** develop which disappears after delivery (Ejection systolic murmur), while **arrhythmias** are pathological !
- Peripheral resistance decreases.

Renal changes:

Dilation of the ureters , kidney pelvis & calyces.

Endocrine changes:

- Prolactin level ↑ untilthe 30th week of pregnancy then more slowly to term. so, sometimes the pregnant lady may tell you that her breast is secreting milk and that is completely normal.
- enlargement of thyroid gland caused by low plasma iodine levels.
- There is **increase in weight** of approximately 12.5kg at term.

Gestational diabetes mellitus

- Gestational diabetes is carbohydrate intolerance that occurs in pregnancy **after the 24th week**
- Previous history of GDM is a risk factor for early screening in patients with mild carbohydrate resistance.
- 2-h 75g OGTT is the standard of care test and what's currently used nowdays for **gestational diabetes.**
- A fasting plasma glucose > 7.0 mmol/L (126 mg/dl) is diagnostic of **overt diabetes.**
- Management before conception in diabetic women include controlling HbA1c levels
- If the glycosylated hemoglobin is elevated, order a fetal echocardiogram at 22–24 weeks to assess for congenital heart disease.

Effects of DM on pregnancy:

Maternal effects:

- The cesarean section rate in diabetic pregnancies approaches 50% because of fetal macrosomia.
- Injury to the birth canal secondary to macrosomia.

Fetal effects:

- Hypoglycemia when baby is exposed to his mom's high blood glucose levels , he produces lots of insulin so as soon as the baby's circulation is detached from his mother he's exposed to high insulin and it causes hypoglycemia.

- Hypocalcemia caused by failure to increase parathyroid hormone synthesis after birth.
- Most common fetal anomalies with **overt DM** are Neural Tube Defects and congenital heart disease.
- Fetal surveillance for macrosomia

Anemia in pregnancy

- Serum iron decreases
- Total Binding Iron Capacity (TBIC) increases
- In strict vegetarians, Vitamin B 12 is also deficient.
- To confirm Iron Deficiency Anemia you need to have: decreased Iron and increased ferritin & transferrin levels.
- Anemia management: If she's less than 30 weeks we give **iron** tablets, but if more than 30 weeks we give **iron** parenteral therapy during pregnancy

Preconception, antepartum, intrapartum and postpartum care

Preconception care

- Women should take a daily multivitamin containing folic acid (0.4 mg per day)
- women who have had an infant with a neural tube defect "high risk women" should take vitamins plus 4 mg of folic acid daily before conception. High risk women: previous Hx of Neural tube defects or if she is on anti-epileptics or obese
- Rubella: if the mother IgG -ve then she should have the vaccine and avoid pregnancy for 3 months

Antepartum care

- Toxoplasmosis: if the mother IgG -ve then she should avoid pets, cook her meats well. Baby will have brain classification, ventriculomegaly and seizure
- Syphilis: baby will have: Sniffles (rhinitis), Saber shin, Saddle nose, Hutchinson'S teeth
- Rubella: baby will have blueberry muffin (petechiae or purpura), cataracts, congenital heart defect, hepatosplenomegaly and deafness
- Herpes: if the mother has active herpes deliver with C/S. congenital herpes are: IUGR, preterm and blindness
- **Smoking** increases the risk of: Miscarriage, placental abruption, Growth retardation, Sudden Infant Death Syndrome, birth defect and preterm delivery.
- Estimated date of delivery: Add 7 days to the first day of LMP , subtract 3 months , add one year

Intrapartum care

- Labor: progressive cervical effacement and dilation resulting from regular painful uterine contractions
- False labor "Braxton-Hicks contractions": Painless, irregular contractions without cervical dilatation & effacement.
- Station: is the fetal presenting part in relation to ischial spine
- Signs of placental separation: a fresh show of blood, umbilical cord lengthens, the fundus of the uterus rises up and the uterus becomes firm and globular.

Postpartum care

- if the patient has perineal pain the most important DDx is: 1- hematoma: if it is small then leave it and give analgesia, if it is big and bleeding (you will see vital abnormality and the size is big) then do drainage 2- tight suture then let her use heat lamp and sitz bath
- **RhoGAM:** If the mother is Rh(D) negative, and her baby is Rh(D) positive, she should be administered 300 µg of RhoGAM IM within 72 hours of delivery.

Antenatal fetal assessment

Indication for antepartum fetal surveillance:

- Maternal
- Pregnancy complication:(decreased fetal movements "most common indication ', IUGR)

Late Pregnancy Assessment:

1-Fetal movement counting (kick chart):

- Started ~28w in normal pregnancy ,~24w in high risk pregnancy .
    - **CARDIFF TECHNIQUE: 10** movements in **12** hours
    - **2-SADOVSKY TECHNIQUE: 4**movements/hour

2-Contraction stress test (CST):

At least 2 uterine contractions over 20 minutes.

3) Non stress test (NST):

- The first step in the assessment of fetal well-being is the NST.
- Reactive:
    - At least two accelerations from baseline of 15 bpm for at least 15 sec within 20 minutes
    - "<32 weeks,≥10beats/min ,lasting≥10s"
- Non-reactive: No acceleration for 40 min > contraction stress test or biophysical profile

4-Amniotic fluid index (AFI)

- Normal value: 5-25cm
- < 5 cm (urinary track anomalies , renal perfusion)
- >24cm (GI track anomalies , decreased fetal swallowing)

5) Biophysical profile (BPP):

Combines NST with USS estimation AFV, fetal breathing, body movement reflex/tone/extension-flexion movement .

6-Doppler Velocimetry :

Doppler studies are mostly valuable for IUGR

Interpretation of CTG:

FHR Baseline	Normal Baseline 110–160 bpm "Severe"bradycardia<100 bpm Tachycardia >180 bpm
Acceleration	Accelerations are always reassuring.
Deceleration	Early = Head compression Late= uteroplacental Insufficiency Variable = Cord compression
Tachycardia	Chorioamnionitis, Mimetic drugs

Invasive Fetal Assessment:

AMNIOCENTESIS

- Done after 15w
- Indications: Bilirubin level (in RH-isoimmunisation)

CHORIONIC VILLUS SAMPLING

- The procedure of choice for first trimester prenatal diagnosis of genetic disorders.
- Usually done after 10w
- Complication: limb defects, fetal loss

CORDOCENTESIS:

Usually done after the 1st trimester (after 13 weeks)

Abnormal Presentation

Terminology

- Lie: relationship of longitudinal axis of **fetus** to longitudinal axis of **mother.** Can be: longitudinal, transverse, or oblique.
- Attitude: relation of the fetal parts to each other. Can be: vertex (maximal flexion → most common), brow (partially extended), face (maximal extension).
- Position: relation of fetal parts to maternal bony pelvis.
- Station: cm above or below **ischial spine**.
- Presentation: part of the fetus that occupies the pelvis. Can be: cephalic, breech, or shoulder.
- Landmarks of different presentations: Vertex → occipital bone / Face → mentum "chin" / Brow → frontal bone.

Abnormal fetal presentation

Breech (most common) presentation

- Types: complete, frank, footling (dangerous; risk of cord prolapse).
- Causes:
  - Maternal: **preterm labor** (most common cause of breech), fibroid, uterine anomalies, small pelvis.
  - Fetal: multiple, placenta previa, oligo/polyhydramnios, short umbilical cord.

- Management:
  - Before 36 weeks → **wait for spontaneous turning of baby.**
  - After 36 weeks → should be offered options:
    - Vaginal breech delivery (VBD): lithotomy position → **after buttocks protrudes from vulva do episiotomy** → deliver body then head.
    - External cephalic version (ECV):
      - ✓ done after 38 weeks, if mum rh-ve give anti-D,
      - ✓ Contraindications: contracted pelvis, scar uterus from **prev C/S or myomectomy**, **placenta previa**.
      - ✓ Complications: membrane rupture, uterine rupture, abruptio placenta, cord prolapse.
    - Elective C/S

Face presentation

- Causes: unknown possibly excessive tone of extensor muscles of fetal neck.
- Diagnosis: during labor by **palpating nose + mouth + eyes** in vaginal exam
- Management (mode of delivery):
  - **Mento-anterior** → vaginal delivery is possible using **forceps**.
  - **Mento-posterior → caesarean**.

Brow presentation

- Diagnosis: during labor by palpating anterior fontanelle + supra-orbital ridge + nose on vaginal exam.
- Management: delivery by **caesarean** (b/c presenting diameter is **13.5 cm** "mento-vertical" which is incompatible with vaginal delivery).

Shoulder presentation

- Causes: **transverse** or **oblique lie**, placenta previa, high parity, pelvic tumor, uterine anomaly.
- Management:
  - Intact membrane → ECV may be attempted if no other pathology.
  - Ruptured membrane → delivery by **emergency caesarean**.

Thromboembolic Disease

- Dupplex Doppler, x-ray venogram & V/Q scan are the main diagnostic tools.
- During pregnancy, LMWH is the preferred anticoagulant as it is more effective and safer than standard heparin. Oral anticoagulant is contraindicated. (If she is on warfarin switch to heparin)
- Oral anticoagulants should not be given at any stage during pregnancy but they are safe & may be more convenient after delivery.

Bleeding in early pregnancy (abortion)

- Female presents with vaginal bleeding in 1st trimester:
  - Ddx: spontaneous abortion, viable intrauterine pregnancy, ectopic pregnancy.
  - Assessment:
    - **serial βHCG** (if ↑50% in 48 hours = viable)
    - transvaginal **US** (to determine site of pregnancy)

	Cervix open	Cervix closed
Products passed	**Incomplete abortion**	**Complete abortion**
Products NOT passed	**Inevitable abortion**	**Missed abortion**

- Spontaneous abortion is loss of pregnancy before **20 weeks** gestation.
- Causes:
  - 1st trimester: **chromosomal abnormalities** → ↑ with ↑ **maternal age**.
  - 2nd trimester: maternal systemic disease, **antiphospholipid syndrome**, abnormal placenta, anatomic reasons, **cervical incompetence** (hx of cervical cone biopsy).
  - Other risk factors: history of abortion, smoking, uncontrolled DM.
- Types:
  - **Threatened abortion**: bleeding + closed cervix + viable intrauterine pregnancy (**intact sac + normal fetal heart**).
  - Inevitable abortion: bleeding + cramping lower abdominal pain + cervic open.
  - **Missed abortion**: vaginal bleeding + closed cervix + US shows long fetal sac with **no fetal heart activity** ⇒ needs evacuation (**D&C**)
- Treatment:
  - Conservative/expectant management: watch and wait.
  - Medical: vaginal misoprostol (used to induce labor)
  - Surgical: D&C
  - REMEMBER to give RhoGAM to Rh-ve women.
- Complications: hemorrhage, endometritis, septic abortion.
- Further investigations: if **recurrent** 2nd trimester abortions → **Hysterosalpingogram**.

Multiple pregnancies

Types:

- Zygosity:
  - Dizygotic “fraternal”: more than 2 eggs fertilized.
  - Monozygotic “identical”: splitting of ovum after fertilization.
- Chorionicity: chorionic (# of placenta) vs amniotic (# of sac)

- Dichorionic-diamniotic → division occurs **0-3 days**.
- Monochorionic-diamniotic → division occurs **4-8 days**.
- Monochorionic-monoamniotic → division occurs **6-12 days**.
- Conjoined / Siamese twins → division **after 12 days**.

Complications

- Maternal: anemia, hyperemesis gravidarum, **preeclampsia**, GDM, hydramnios, C/S, uterine atony & postpartum hemorrhage.
- Fetal: congenital abnormalities, IUGR, placental abruption, cord entanglement (mono-mono), malpresentation, prematurity, placenta previa, cord prolapse.
- **TTTS** (**twin-to-twin transfusion syndrome**) in monochorionic → imbalance of blood flow b/w AV communications leading to:
  - One baby "donor" = underperfused (hypovolemia, hypotension, oligohydramnios, anemia, growth restriction)
  - Other baby "recipient" = overperfused (hypervolemia, hypertension, polyhydramnios, cardiomegaly, thrombosis, edema, ascites).

Management

- Early **US is diagnostic** (shows number of fetuses).
- To **determine chorionicity** do early **US** (lambda sign → di-di twins).
- Monitoring is important! Both mother (BP, GDM) and babies.
- Management:
  - Adequate nutrition for mother = iron + folate + calcium.
  - The mode of delivery depends on GA, chorionicity, presentation, etc..
  - Mo-mo are always delivered preterm (32-34W) due to risk of cord entanglement by C/S + betamethasone.
  - Di-mo (at 34-37+6W) and di-di (can reach up to 38 weeks) can be delivered either:
    - Vaginally if **cephalic-cephalic** (**most common presentation**) or cephalic-breech.
    - **C/S** if breech-breech or **breech-cephalic**.
    - Note that the first fetus to be delivered determines the mode of delivery.

PreEclampsia/Eclampsia/Gestational HTN

- **Preeclampsia:** Onset of high blood pressure (> 140/90) after 20 weeks gestation with proteinuria (+1 dipstick or 300 mg/dl) or end organ dysfunction or without proteinuria with presence of 1 or more of sever preeclampsia
- **Eclampsia:** presence of new-onset g rand m al seizures in a woman with preeclampsia
- **chronic hypertension:** known hypertension before pregnancy or development of hypertension before 20 weeks' gestation .
- **superimposed preeclampsia:** those women with chronic hypertension who develop new onset proteinuria.
- **gestational hypertension:** hypertension without proteinuria or other signs of organ dysfunction first a ppears after 20 weeks' gestation or within 48 to 72 h ours of d elivery and resolves by 12 weeks postpartum.
- **Sever preeclamisa:** thrombocytopenia, DIC, elevated transaminases or other signs of hepatic injury, CNS symptoms, an elevated serum creatinine level, pulmonary edema

Management

- Preeclampsia Gestational age 37 or more → delivery
- severe preeclampsia or eclampsia whose disease presents at or beyond 34 weeks' gestation → delivery
- Severe preeclampsia presenting at less than 34 weeks' gestation
  - seizure prophylaxis : magnesium sulfate IV, IM
  - control of hypertension (Arterial blood pressure ≥160 mm Hg systolic or ≥110 mm Hg diastolic must be treated immediately)
    - Hydralazine: the best
    - Labetalol Hydrochloride: Avoid if evidence of asthma or acute heart failure .
    - Nifedipine.
- Eclampsia: Treatment for seizure is magnesium sulfate & delivery of baby.
- Chronic hypertension
  - Methyldopa is the safest antihypertensive medication in pregnancy.
  - calcium channel blockers.
  - labetalol

Post term pregnancy

- Definition: pregnancy reaching or extending beyond 42 weeks of estimated gestational age.
- Most common cause: **incorrect estimation of gestational age**.
- Complications:
  - Maternal: vaginal trauma, caesarean section (and subsequent complications: infection, bleeding, thromboembolic events, visceral injury), postpartum hemorrhage.
  - Fetal:
    - Macrosomia: >4.5 kg → ↑ risk of C/S, shoulder dystocia.
    - Postmaturity syndrome: due to infarction of placenta → decrease fetal subcutaneous fat + dry wrinkly skin + long fingernails.
    - **Meconium aspiration syndrome**: leading to chemical pneumonitis, mechanical obstruction.
    - Oligohydramnios: baby prioritizes blood to brain & thus decrease urine production.
    - **Intrauterine fetal demise** **(UFD)** increases after 41 weeks.
- Intervention:
  - **First we must accurately measure gestational age.**
  - Membrane sweeping → release prostaglandins that increase chance of spontaneous labor.
  - Fetal surveillance should begin at 41 weeks "expectant management"
  - **Induction of labor should occur between 41 & 42 weeks.**

Induction Of Labor (IOL)

- Risks: Abnormal fetal heart rate patterns, Delivery of preterm infant due to incorrect estimation of GA, Meconium fetal aspiration
- Indications: Post-term pregnancy, IUGR, Non-reassuring fetal surveillance, Maternal medical conditions (DM, renal disease, HPT, gestational HPT), Fetal death.
- Contraindications: Previous myomectomy, Fetal transverse lie, Placenta previa, Vasa previa

Methods of IOL

- If the cervix is still unfavorable: cervical ripening with prostaglandin E1 or E2
- Consider amniotomy + oxytocin only if the cervix is partially dilated and completely effaced, and the fetal head is well applied

IUFD

Management

Watchful expectancy	• **About 80% of patients experience the spontaneous onset of labor within 2 to 3 weeks of fetal demise.** • Rare complications include intrauterine infection and maternal coagulopathy

Induction of labor (IOL)	• **Indications:** emotional, those in risk of chorioamnionitis, IUFD >5 weeks
	From week 12-28
	• Vaginal suppositories of prostaglandin E2 (dinoprostone)
	  ○ contraindicated in patients with prior uterine incisions, patients with history of asthma or active pulmonary disease
	• Misoprostol
	• **After 28 weeks**
	  • if the cervix is favorable: **Misoprostol followed by oxytocin**

Operative Deliveries

- Instruments used in operative vaginal delivery: Forceps and Vacuum (ventouse extractor)
- **The *vacuum extractor* is contraindicated in preterm delivery**

Indications of operative delivery

- **Maternal**
  - Prolonged or arrested 2nd stage labor epically in Maternal cardiac disease
  - Poor maternal effort
  - Patients with retinal detachment or post op for similar ocular conditions.
- **Fetal**
  - Fetal distress
  - Prematurity (use Forceps only)
  - Certain malpositions e.g. occipitoposterior

Prerequisite for forceps and ventouse

Cervix has to be fully dilated + Membranes ruptured + Head has to be engaged (0 station) + Head position known + Vertex (cephalic) presentation.

Complications of Instrumental Delivery

Genital tract lacerations (Cervix, vagina), maternal Hemorrhage, Facial Palsy to the fetus

Puerperal sepsis

Common postpartum infections

	Risk factors	Causes	Clinical finding	Management
Urinary tract infection	Foley catheter or vaginal procedure	Normal bowel flora	• High fever • Costovertebral flank tenderness • Positive urinalysis	Nitrofurantoin & cephalosporins
Wound infection	Emergency cesarean section after prolonged rupture of membrane and prolonged labor	Streptococcus Staphylococcus	Persistent spiking fever despite antibiotics.	Cephalosporin
Mastitis or breast abscess	Breastfeeding women	S. aureus	• Fever of variable degree • localized, unilateral breast tenderness.	7-10 days of Dicloxacillin
Endometritis	• Cesarean section • Prolonged ROM • Prolong internal fetal monitoring	polymicrobial infections		gentamicin & clindamycin

Rhesus Isoimmunization

Requirements

1. Mother must be antigen negative
2. Baby must be antigen positive. (So father is **+**).
3. Adequate fetal RBCs must cross over into the maternal circulation
4. Antibodies associated with Hemolytic disease of the newborn (Erythroblastosis fetalis)
5. A significant titer of maternal antibodies must be present to cross over the fetus (>1:8)

Detecting Fetomaternal/Transplacental Hemorrhage

Kleihauer-Betke test: This can assess whether more than one vial of RhoGAM needs to be given when large volumes of fetal–maternal bleed may occur (e.g., abruptio placentae).

Techniques to Evaluate Fetal Rh Status

- MCA doppler (most valuable to detect fetal anemia)
- Amniotic fluid spectrophotometry (best to estimate fetal bilirubin concentration)
- Percutaneous umbilical blood sampling (PUBS) → we can measure fetal Hb, Hct, blood gases, pH, and bilirubin levels.

Management Plan/Approach

- Fetal risk is present (have all requirements) but no severe anemia: 1st pregnancy give Rho-GAM, not 1st pregnancy just wait and watch
- Atypical antibody titer (1:8): management is conservative. Repeat the titer Monthly (2 to 4 weeks) as long as it remains <1:8 .
- Severe anemia (PUBS shows fetal hematocrit to be ≤25% or MCA flow is elevated): Intrauterine transfusion (fresh O Rh-)
- **Timing of delivery:**
- Delivery is performed if gestational age is >34 week.
- If delivery is expected to occur before 34 weeks' gestation betamethasone should be given at least 48 hours before deliver
- **Rho-GAM**
- As prevention in pregnant woman when there is significant risk of fetal RBCs passing into her circulation
- Uncomplicated pregnancy (if she is Rh- and titer is < 1:8): 300 µg of RhoGAM prophylactically.
- Within 72 h of (delivery of an Rh(D)-positive infant, chorionic villus sampling (CVS), or D&C) → 300 mcg of RhoGAM
- All pregnant women who are RhD -ve and Anti D -ve and experience → (spontaneous or induced abortion, ectopic pregnancy, significant vaginal bleeding, abdominal trauma, or external cephalic version) should receive 50 to 100 µg before 12 week of gestation and 300 µg after 12 week.
- "partial" molar pregnancy.

PROM

- Premature rupture of the membranes (PROM): Premature rupture of membranes before the onset of labor
- preterm PROM (PPROM): Preterm premature rupture of membranes occurring before 37 weeks estimated gestational age

Diagnosis

- on physical exam: A sterile speculum examination (pooling test) + An ultrasound should be performed to assess fetal position as well as to assess the amount of amniotic fluid
- confirmation: Nitrazine paper which will turn blue + Ferning
- Chorioamnionitis is diagnosed clinically with all the following criteria needed: Maternal fever and uterine tenderness, purulent fluid from cervical os and maternal leukocytosis and maternal tachycardia.

Management

- If the patient is term > 37 weeks: If the patient does not go into spontaneous labor on her own then labor induction should be performed with oxytocin .
- from 34 to 36 weeks and six days: An induction of labor has started for these patients once rupture of membranes is confirmed. If the fetus is breach then a cesarean section will have to be performed . So management exactly same as term PROM.

- between 24 weeks and 33 and 6 days: inpatient + Corticosteroids + Tocolytics + Antibiotics. Delivery will be induced between 32 and 34 weeks
- PROM occurs less than (< 23w of GA): Either induce labor or manage patient with bed rest at home.
- Chorioamnionitis: delivery

Preterm labor

- Delivery between 24-37 wks of EGA that include **uterine contractions** + **cervical dilation** (at least 2 cm) or change in serial examination(in dilation or effacement).
- Evaluations: Vaginal examination → cervical length, dilation, station, presentation. Swap/Culture for presence of Group B strep.
- Diagnosis: True Uterine contractions → 4/20 min. (Poor indicator of preterm labor). Cervical changes → 80 % effacement or 2 cm dilation. (Good indicator)

Management

- Hydration and bed rest
- Antibiotic
- If a patient doesn't respond to hydration and bed rest, give **Tocolytic** therapy.
- **Betamethasone if <34w** .
- **Delivery in Preterm labor is usually vaginally** (normally or using outlet forceps), except for very low-birth fetuses (↓ 1500 g) where cesarean delivery is better, as in 28 wks. breech presentation.
- Hx of preterm labor or Hx of short cervix: Progesterone
- If patient is 24-34 weeks EGA: **Corticosteroids** : Most important to reduce the rates for Respiratory distress syndrome, Intracranial hemorrhage, Necrotizing enterocolitis, and death.

Bleeding in early pregnancy (Ectopic)

- Definition: implantation of embryo outside the uterine cavity (most commonly fallopian tube, specifically distal **ampulla**).
- Risk factors: **PID** (x3), history of ectopic, history of tubal surgery, history of **chlamydia** infection, smoking, idiopathic, **IUCD**.
- Presentation: **amenorrhea** + unilateral **lower abdominal** pain + **vaginal bleeding**.
- Investigation: **serial βHCG** (no or poor increase in levels) + vaginal US (absence of intrauterine pregnancy).
- Management:
  - Medical → **methotrexate.**
    - Absolute #: hemodynamic instability, liver/kidney disease, lung disease, breast feeding, not complying w/ follow up βHCG testing.
    - **Relative #**: fetal cardiac activity, large ectopic >3.5cm, high βHCG>5000mIU.
  - Surgical:
    - laparoscopy (better) or laparotomy (reserved for ruptured)

- salpingostomy (only removing ectopic pregnancy / may recur) or salpingectomy (removal of entire tube / better if other tube is normal).

3rd trimester bleeding

- **Placental abruption** (**painful** vaginal bleeding) "most common"
  - Risk factors: trauma, cocaine, **HTN**, multiple gestations, prev hx of abruption.
  - Diagnose by clinical examination.
- **Placenta previa** (**painless** vaginal bleeding)
  - Diagnose by US (digital cervical exam is #).
  - Risk factors: **prev. C/S**. history of myomectomy, multiparous, advanced age, smoking, multiple gestations.
  - Management: mode of delivery is **C/S**.
  - Complications: bleeding or extension of placental tissue (accreta, increta, percreta) may require caesarean hysterectomy.
  - **Vasa previa** (**fetal blood** loss → can lead to antepartum hemorrhage + fetal death)
- Note: **Kleihauer-betke test** can determine if baby or mother is bleeding by detecting fetal erythrocytes in maternal blood.

Intrauterine Growth Restriction (IUGR)

IUGR: estimated fetal weight (EFW) <5−10%ile for gestational age. Or birth weight <2,500 gram

Types:

1-Symmetric IUGR :

- Head and abdomen both small
- Etiology: Fetal (decreased growth potential)
- causes: aneuploidy (T21, T18, T13); infection (TORCH/also could be malaria.), structural anomalies
- Work up: detailed sonogram, karyotype, and screen for fetal infections

2-Asymmetric IUGR:

- Head normal, abdomen small
- Etiology: Maternal + Placental
- Placental: primary placental disease) , infarction, abruption,TTTS, velamentous cord insertion.
- Maternal: hypertension , small vessel disease (SLE, Chronic DM1), malnutrition, tobacco, alcohol, street drugs, antiphospholipid syndrome , Infections, Teratogen exposure.
- Work up: Monitoring is with serial sonograms, non-stress test, AFI, biophysical profile, and umbilical artery Dopplers

Diagnosis :

- **Screening tool** low-risk women is the assessment of uterine size by fundal height measurement.
- Ultrasonography is the **gold standard** to assess fetal weight
- Doppler (umbilical , uterine artery S/D ratio ,MCA).
- Absent / reversed end-diastolic flow predicts worse prenatal outcomes and its usually an indicator for delivery.

Antepartum care:

- Fetal monitoring -> normal. DO Ultrasonography ->
- normal growth = no clinical intervention.
- abnormal strongly suggests IUGR -> delivery is indicated at gestational ages of 34 weeks.
- assess Pulmonary maturity by amniocentesis, but If severe oligohydramnios -> delivery should be strongly considered without assessment of lung maturity.
- .ambiguous (equivocal for IUGR -> bed rest (w/ kick counting), fetal surveillance, and serial U/S measurements at 3-weekly intervals .

After birth:

- **Examine**: to rule out congenital anomalies, chronic infections.
- **Monitor:** (hypoglycemia ,hypothermia ,Respiratory distress syndrome)

Macrosomia:

- >90–95%ile for gestational age. Or (EFW) 4000-4500 grams
- management: Elective cesarean (if EFW >4,500 g in diabetic mother or >5,000 g in nondiabetic mother).

Postpartum Hemorrhage

- vaginal delivery blood loss ≥500 mL or cesarean section blood loss ≥1,000 mL

Classifications:

- Primary: 99% happens only in the first 24h of delivery. Secondary: After 24 h.

	Signs	Management
Uterine atony	Enlarged floppy, soft uterus like a dough	Uterine massage, Oxytocin, ergot, Carboprost. Or Surgery if the above didn't work> B-lynch suture, uterine artery ligation of **Internal iliac**, embolization.
Lacerations	Using vaginal delivery instruments with the presence of a contracted uterus.	Suturing & repair
Retained placenta	Missing placental cotyledons	Uterine curettage. Or manual removal

DIC	bleeding from IV /venipuncture sites	Correction of coagulopathy
Uterine inversion	Beefy-appearing, and failure to palpate the uterus abdominally	elevating the vaginal fornices and lifting the uterus back and oxytocin.

Prevention of uterine atony by active management of third stage of labor:
fundal massage, gentle cord traction, IV/IM oxytocin.

Puberty Disorder

Central precocious puberty (CPP)
- CPP is physiologically normal pubertal development that occur at an early age.
- Causes: Idiopathic, CNS tumors, CNS dysfunction
- Investigations: Increased LH: LH/FSH ratio > 1 → Pubertal gonadotropin response CPP. GnRH stimulation test: high LH > FSH
- Tx: The treatment of choice is A GnRH Analogue

Peripheral precocious puberty/ Pseudo PP (PPP).
- GnRH independent Due to inappropriate sex hormone secretion or exposure to exogenous sex steroids.
- Causes: Abnormal secretion of gonadotropins, Functioning ovarian tumors or cyst, Congenital adrenal hyperplasia
- Investigations: Decreases LH: LH/FSH ratio < 1 → Prepubertal gonadotropin secretion (PPP). GnRH stimulation test: FSH > LH
- Tx: Treat the cause.

Amenorrhea

Primary amenorrhea
- if Breasts present, uterus present most commoly it is imperforate hymen
- if Breasts present, uterus absent. Differential diagnosis is Müllerian agenesis or complete androgen insensitivity
- if breast is abcent and uterus is present: one of DDx is Turner's syndrome (45 x 0) → gonadal dysgenesis

Secondary amenorrhea
- Asherman's syndrome: Secondary amenorrhea following destruction of the endometrium By overzealous curettage
- Premature menopause: Ovarian failure
- Hyperprolactinemia: due to pituitary adenoma seen on MRI. Tx: Bromocriptine
- Sheehan's syndrome: Necrosis of ant. pituitary due to severe postpartum hemorrhage, Bc of panpituitarism the prolactin may not secreted → unable to breastfeed

Investigation of secondary amenorrhea

- Pregnancy Test. The first step in management of secondary amenorrhea is to obtain a qualitative β- hCG test to rule out pregnancy.
- Progesterone Challenge Test (PCT): +ve means anovulation (e.g. PCOS)
- Estrogen–Progesterone Challenge Test (EPCT)
  - Elevated FSH suggests ovarian failure (e.g. premature menopause)
  - Low FSH suggests hypothalamic–pituitary insufficiency (e.g. pituitary tumors)
  - –ve EPCT means abnormal flow (e.g. Asherman syndrome)

Pelvic Inflammatory Diseases (PID)

- Ascending microorganisms from vagina & endocervix to endometrium, tubes, contiguous structures.

N. Gonorrhoeae	N. Gonorrhoeae
Gram –ve diplococcus	Intracellular organism
	Produce mild form of salpingitis.
Rapid growth	Slow growth
Rapid and intense inflammatory response	Insidious onset

- Signs & symptoms: Abdominal pain, Abnormal Discharge, Fever
- Management: ceftriaxone + doxycycline ± metronidazole and treat the partner (Reinfection can occur if male partner is untreated)

Polycystic Ovarian Syndrome (PCOS)

- Characterized by ovulatory dysfunction and hyperandrogenism.
- a set of symptoms due to elevated Androgens in women.

Biochemical changes :

1. Raised androgen production." testosterone"
2. Peripheral insulin resistance and hyperinsulinemia
3. Proposed mechanism for anovulation and elevated androgen level is due to increase level of luteinizing hormone.

Signs and symptoms:

- Menstrual dysfunction
- Anovulation
- Signs of hyperandrogenism (Hirsutism,acne,hair fall).
- infertility.
- Obesity

Investigation :

LH, FSH levels & ultrasounds & Endometrial biopsy (malignancy)

criteria of diagnosing:

- After excluding other diseases, we have to find 2 criteria from the 3 which is:
- anovulatory cycle(change in menstrual pattern).

- Hyperandrogenism (hirsutism, acne, Acanthosisnigricans, hair loss) or biochemical
- US shows polycystic.

Management:

1. **Lifestyle modification** is the first line of treatment
2. **Medical management:**
    - Menstrual irregularity: First-line medical therapy is oral contraceptive
    - Anovulation: Clomiphene citrate or letrozole
    - Hypoglycemic agent: Metformin
    - Topical hair removal: eflornithine
    - Topical acne agent: benzoyl peroxide, tretinoin topical cream
3. **Surgical management:** aim to restore ovulation
    - Laparoscopically: (ectrocutare /Laser drilling. / Multiple biopsy)

Contraception

Long acting reversible contraception

Progesterone IUD

Side effect: lighter menstrual cycle or amenorrhea.

Copper IUD:

Side effects include heavier and crampier periods.

Implants:

Side effects include irregular bleeding spotting for the duration of insertion.

- The only contraindications to all IUD use are **pelvic infection** , **cancer of the uterus** , or distortion or inappropriate **size of the uterine cavity** .

Sterilization

Male Sterilization:

- whether right or left vas deferens is ligated to prevent sperm from entering the rest of the seminal fluid.
- Semen analysis is collected 4-3 months with 20 ejaculates

Female Sterilization

- Tube Ligation or Hysteroscopy tube occlusion
- **Cons of female sterilization:** Ectopic pregnancy
- **Pros of female sterilization:** Decrease lifetime risk of ovarian cancer, Protection from pelvic inflammatory diseases.

Estrogen- progesterone contraceptives

- Mini pills (progesterone-only pills) only work efficiently with regular and frequent breastfeeding.
- increases the risk of DVT
- **Contraindications:**
    - Migraine with aura
    - History of blood clots
    - Personal history of breast cancer
    - Personal history of liver disease
    - **For women over 35 the list also include:** Smoking, HTN or migraine.

Depo Provera injections

Side effects include Amenorrhea and an average of 10 pounds weight gain.

Barriers

female and male condoms are protected against sexual transmitted infections.

Emergency Contraception

- two pills 0.75 mg of levonorgestrel within 72 hours of the intercourse.
- ulipristal acetate 30 mg and it can be used up to 120 hours after the intercourse.

Endometriosis

- **Definition:** Benign condition in which endometrial glands and stroma are present outside the uterine cavity and walls.
- **Occurrence:** women with chronic pelvic pain have endometriosis.
- **Sites of occurrence:** ovaries, Pelvic peritoneum → Posterior cul-de-sac, Round ligament, fallopian tube.
- **Symptoms:** Dysmenorrhea + Dyspareunia + Dyschezia
- **Signs:**
  - fixed non-Mobile uterus. Secondary to adhesions.
  - ovarian endometriosis (chocolate cyst) tender but not palpable.
  - uterosacral nodularity (classic sign).
- **Diagnosis:** 2 out of 4
  - endometrial stroma
  - endometrial gland
  - endometrial epithelium
  - hemosiderin-laden macrophages.

Management:

- **Medical therapy:** Ether Pregnancy If Wanted Or Pseudopregnancy Pseudomenopause.
- **Surgical therapy:** Large endometriomas (>3 cm) are usually amenable only to surgical resection.
- **Follow up:** it is Not malignant but associated with higher risk of ovarian carcinoma by mechanism which is not clear.

Lower genital tract infections

Vulvar vaginitis

Bacterial vaginosis (most common)

- Polymicrobial infection → imbalance of normal aerobic & anaerobic organisms.
- Risk factors: postmenopausal women.
- Symptoms: thin **white** discharge, **fishy** odor.
- Diagnosis: wet mount (**clue cells** w/ stippled border), pH>4.5, whiff test.
- Treatment: metronidazole 1st line (oral or vaginal), or clindamycin (vaginal).

Vulvovaginal candidiasis

- Organism: candida albicans → most common.
- Risk factors: DM, obesity, pregnancy, antibiotics, C/S, **OCP**, tight clothes.
- Symptoms: **thick** white **cheesy** discharge, **itching**, dyspareunia.

- Diagnosis: wet mount (**pseudohyphae**, yeast), pH < 4.5, +ve yeast culture.
- Treatment: fluconazole (antifungal single dose), or vaginal miconazole.

Trichomoniasis

- Organism: trichomonas vaginalis → facilitates transmission of HIV
- Risk factors: swimming pools, hot tubs, **STDs**. Associated w/ PID, endometritis.
- Symptoms: **yellow** profuse frothy discharge, **malodorous**, strawberry cervix.
- Diagnosis: wet mount (**flagellated** motile org.), pH > 4.5, test for other STDs.
- Management: **metronidazole** (1st line) + treat partner.

Dysmenorrhea

Primary dysmenorrhea

- The symptoms typically begin several hours prior to the onset of menstruation and continue for 1 to 3 days .
- Symptoms appear to be caused by excess production of endometrial prostaglandin F2α resulting from the spiral arteriolar constriction and necrosis that follow progesterone withdrawal as the corpus luteum involutes
- Treatment: NSAIDs are first-line. Oral contraceptives second line

Secondary dysmenorrhea

Causes

4. **Endometriosis**
5. Adhesions
6. **Pelvic Inflammatory Infection**
7. **Adenomyosis**
8. **Leiomyomata**
9. Polyps
10. Cervical stenosis
11. Tumors (benign or malignant) or cysts

Management

Treat the underlying cause

Menopause

- Menopause is defined as 12 months of amenorrhea , associated with elevation of (FSH, LH)
- At the time of menopause FSH concentrations > 30 mIU/ml

Sign and Symptoms

- Amenorrhea: The most common symptom is secondary amenorrhea
- Hot flushes: predictable profuse sweating and sensation of heat
- Increased risk of osteoporosis
  - We give Ca^{2+} + vitamin D, encourage them to do weight –bearing exercise, stop smoking and alcohol. We could give HRT or bisphosphonates (alendronate, risedronate) or SERM (raloxifene)

Management

Systemic Hormone therapy (HRT): It is the most effective treatment for hot flushes. If she has a uterus we give estrogen + progesterone (to protect her from endometrial cancer). If she has no uterus we give estrogen only.

Pelvic Floor Disorders

- Cystocele: Herniation or bulging of the anterior vaginal wall and overlying bladder base into the vaginal lumen. Triad: 1- Postmenopausal woman 2- Anterior vaginal wall protrusion 3- Urinary incontinence
- Rectocele: Herniation or bulging of the posterior vaginal wall and underlying rectum into the vaginal lumen. Triad: 1- Postmenopausal woman 2- Posterior vaginal wall protrusion 3- Digitally assisted removal of stool
- Enterocele: Herniation of the pouch of Douglas containing small bowel into the vaginal lumen
- Symptoms: Vaginal pressure or heaviness, Vaginal or perineal pain or discomfort
- Risk factors: One vaginal delivery or more, Pelvic surgery, increased intra-abdominal pressure

Pelvic Organ Prolapse Quantification examination

- **Stage 0** : No prolapse, the cervix or vaginal cuff is at the top of the vagina.
- **Stage I** : The leading part of the prolapse is more than 1 cm above the hymen
- **Stage II** : The leading part of the prolapse is less than or equal to 1cm above or below the hymen
- **Stage III** : The leading edge is more than 1 cm beyond the hymen, but less than or equal to the total vaginal length
- **Stage IV (Procidentia)** : Complete eversion

Management

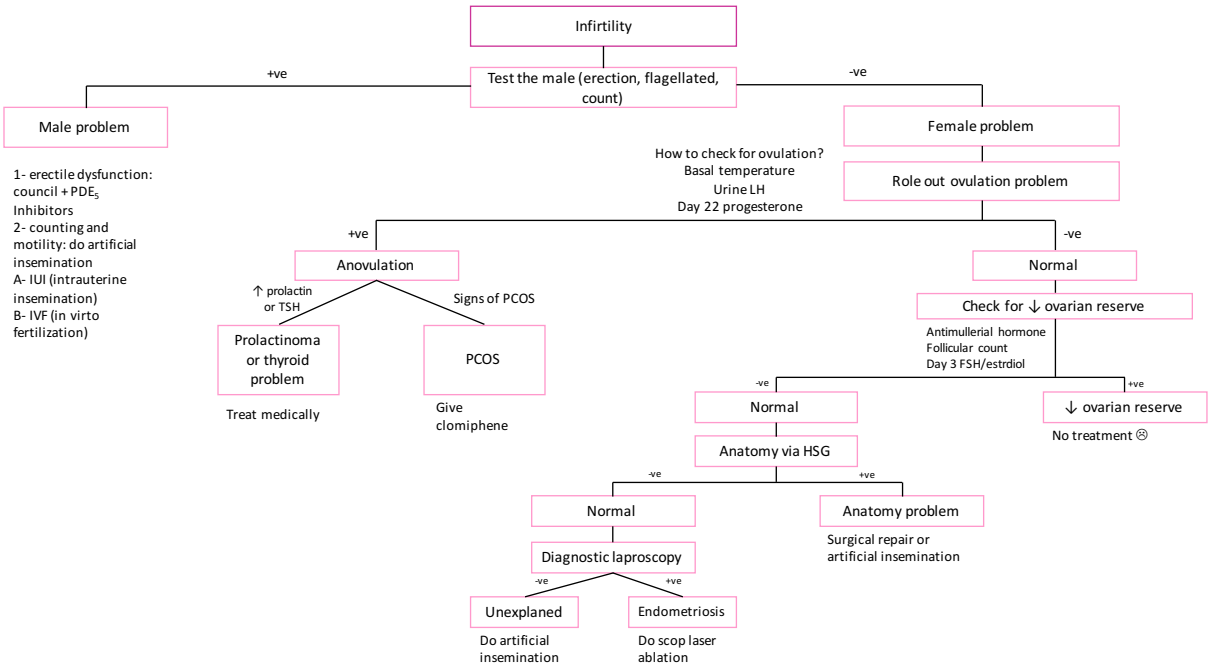
Kegel exercises + Pessaries

Incontinence

	Stress incontinence	Hypertonic (urge) incontinence	Hypotonic (neurogenic) incontinence	Irritable bladder	Fistula
Cause	Muliparity Increase abdominal pressure	Detrusor muscle over activity	Absent Detrusor muscle contraction due to neurological cause (MS, DM, trauma)	Inflammation coming from stone, UTI or cancer	Previous radiation or surgery on the pelvic. IBD (crohn)
Presentation	Urine loss with increased intra-abdominal pressure	Urgency Nocturnal Leak of urine	Loss of urine intermittently in small amounts and pelvic fullness.	Frequency, urgency, dysuria	Contious leak with normal function
Diagnosis	You may find cystocele Q-tip test +ve Urine analysis –ve	Physical examination normal Urine analysis –ve	Physical examination: distended bladder	Physical examination is normal	You will see the fistula on physical examination

	Cystometry - ve	Cystometry: involuntary detrusor contractions	Urine analysis – ve Cytometry: markedly increased residual volume	Urine analysis: WBCs, RBCs Cytometry: normal	
Treatment	Keagel Pessaries Surgery (Tension-Free Vaginal Tape or mmK)	Anticholinergic medications: oxybutynin and tolterodine	Intermittent self-catheterization. Cholinergic medications + α-adrenergic blocker	Treat the underlysing cause	Surgery (fistuloectomy)

Infertility



Fibroid

Types of fibroids

- Intramural is the most common type & usually asymptomatic.
- Subserosal, can be described as non-tender firm mass. Its symptoms depend on their location (pressure symptoms).

- Submucosal, distort the uterine cavity. Most common present as menorrhagia or metrorrhagia.
- Other types, pedunculated & parasitic.

Degenerations of fibroids:

- Red degeneration, in pregnant women. extreme, acute pain, and narcotics. Should be managed by analgesia in pregnant. Myomectomy done after pregnancy.
- Calcific degeneration, it's potential to become sarcoma.
- Others degenerations like, Hyaline, fatty, cystic, necrosis.

Dx of Fibroids

Hx & PE, US (abdominal &transvaginal US to exclude endometrial hyperplasia), CT & MRI. Hysteroscopy (for submucosal fibroids). Biopsy.

Management.

- **Observation** mostly.
- **Medications** if she refused surgery. Deprovera, GnRH analogous, Danazol
- **Surgery**, Myomectomy. If patient wishes to maintain fertility. Hysterectomy, If patient has completed her childbearing; definitive therapy is an abdominal or vaginal hysterectomy.
- **Embolization** if she wants to preserve the uterus.

Abnormal uterine bleeding

- menstrual flow outside of normal regularity, frequency, volume or duration. common and can range from complete absence of bleeding (amenorrhea) to life-threatening hemorrhage.

Etiology

PALM COEIN acronym for AUB differentials.

structural (PALM, most common in peri and post-menopausal women):

- Polyp.
- Adenomyosis. identifying an enlarged, symmetric, tender uterus.
- Leiomyoma.
- Malignancy.

functional (COEIN , most common in reproductive women):

- Coagulopathy: most common in adolescent women who presents with heavy bleeding.
- Ovulatory Dysfunction: PCOS (most common cause of ovulatory dysfunction), STD.
- Endometrial process: usually affected by estrogen.
- Iatrogenic.
- Not yet classified.

Evaluation of AUB

- Hx & PE.
- If the period is irregular: ovulatory dysfunction.
- If there is bleeding between the periods: structural cause
- Heavy periods: coagulopathy
- Labs: Thyroid, CBC, Anemia, coagulopathy.

- EMB in high risk women, like DM, Obesity.
- US.

ONCOLOGY REVISION (Done by Rawan AL Qahtani)

1. Cervical neoplasms:

- **How to screen for cervical cancer and when?**
  1. By Pap smear: we start screen the patient at the age of > 21 years old , every 3 years. Until 65 years old which is the upper limit because the incidence is not significant.
  2. HPV test: It is the other way for screening. we start screen the patient at the age of >30 years old, every 5 years. Why > 30, Because 80-90% of them will be positive for HPV infection in patients 20-30 years old and they will clear it spontaneously by their immune systems. Only 10-20% they will have persistent infection which will progress and change their DNA and lead to tumor growth. For those who have persistent HPV positive we have to do colposcopy to visualize the cervix, if we can not see anything we will take random biopsy to detect any premalignant lesion.
- **How HPV cause carcinogenic transformation?**

  After entering our body, it targets the cervical cells and start to change DNA especially two tumor suppressor gene which are p53 and retinoblastoma. So Viral protein called E6 suppresses p53, while E7 suppress retinoblastoma gene. These two genes were important as check point which prevent and correct any abnormal change in cells. So inhibition of tumor suppressor gene will lead to carcinogenesis changes. This process takes from 10-15 years to years to progress into cancer and need less time in immunocompromised patients.
- **HPV Vaccine:**
  - 99.9% of cervical cancer is HPV positive, so this is the only cancer which we know the cause of it and it is preventable by HPV Vaccine.
  - There are different oncogene strains of HPV, such as 16 & 18 & 31 & 33 & 45 & 52 & 58 which cause 95% of cervical cancer. While 6 & 11 are benign strain which cause warts.
  - Now the latest vaccine (Gardasil) covers 9 strain which are (16,18,31,33,45,52,58).
  - Some of studies shows 93% decreased the incidence of cervical cancer with those who had high grade lesion. Which mean you prevent 93% of people with high grade lesion to progress to cancer.
  - Patients who are +ve or already show dysplasia can still receive HPV vaccine, as it can protect them from other strains of HPV.
  - In some country they vaccinated both female and male.
- **What are the expected results from pap smear?**
  - Normal (I will repeat it every 3 year)
  - Cancer: (Squamous cell carcinoma (70%) or Adenocarcinoma (20%) which is more aggressive and come from the canal)
  - precancerous abnormality (DYSPLESIA),
    - High grade (HSL) .
    - Low grade (ASCUS & LSL) { ASCUS =Atypical squamous cell of undetermined significant, this is the most common abnormality in pap smear, and the only indication for HPV test with best advantage and cost effective way to screen the people with ASCUS by using HPV test so any patient with ASCUS it is worth to screen them with HPV}.
      - ✓ If it was positive, we go to colposcopy.
      - ✓ If it was negative, we go to normal screening every 3 years.
- **What we will do next in case of abnormal finding in pap smear?**

We will go for colposcopy to visualize the cervix If shows a lesion you can take intralesional biopsy. If not, take a random biopsy.

- If they were negative or low grade such as CIN1, reassure the patient and follow her after 6 months.
- If they were CIN2 or CIN3, we have to do something additional either cone biopsy or LEEP. Looking for margins, if they are -ve so the patient is treated which mean I already have taken the lesion so no need for further therapy, if the margins were positive we have to do another cone biopsy and council her about hysterectomy if she completed her family.
- If the biopsy shows cancer, which is defined as invasion of basement membrane. In precancerous lesion or dysplasia, it may involve the whole thickness, but it never never invades the basement membrane. Once it starts invade the basement membrane it is now invasive cervical cancer.

- What is the most common histopathological cervical cancer?

Squamous cell carcinoma (70%) or Adenocarcinoma (25%) lymphoma, sarcoma and metastasis (5%).

- Staging of Cervical cancer:
  - In any cancer, we need to stage so we can determine the management.
  - Cervical cancer is clinically staging which mean by simple tools such as (CT, MRI, physical examination, histories, colposcopy, proctoscopy and cystoscopy) we can stage it. Unlike other gyn cancer which surgically staging which mean we need to do surgery to stage it. Even if the surgery reveal positive finding such as lymph node or invasive of rectum we will not change our clinical staging or upgrade it. But for sure the management will be change according to the finding.
  - The most common gynecological cancer in developing country is cervical, because the low socioeconomic status.
  - The most common gynecological cancer in developed country is Endometrial, because their lifestyle and obesity.
  - The most common gynecological cancer in Saudi Arabia country is Ovarian

- ***Done by Luluh Alzeghayer,435 <3***

Staging is clinical (not histopathological):

Stage	Characters	Management
1A1	Microinvasive. Width <7 mm. Depth 0-3 mm.	• **Cone biopsy with -ve margins.** • Or **simple hysterectomy.**
1A2	Microinvasive. Width <7 mm. Depth 3-5 mm.	**Radical hysterectomy + LN dissection.**
1B1	Invasive > 5mm. < 4 cm.	Or **trachelectomy[5] + LN dissection** with the following: • Women who wish to preserve fertility. • Adenocarcinoma or squamous carcinoma only. • < 2cm lesion. • -ve LN biopsy • After pregnancy > cerclage > deliver by CS
1B2	Invasive > 5mm. > 4 cm.	
2A1	Upper ⅔ vagina. < 4 cm.	
2A2	Upper ⅔ vagina. > 4 cm	
2B	+ve **margins** +ve **LN** +ve **Parametria**	>2B "To be or not to be" • **No role of surgery.** • **Chemoradiotherapy:** Low dose chemo for sensitization to radiotherapy. Radiotherapy can be used alone in patients who can't tolerate chemo (cisplatin) toxicity.
3A	Lower ⅓ vagina	
3B	Pelvic sidewall +/- hydronephrosis	
4A	Rectum / bladder	
4B	Distant metastasis	**Palliative therapy:** analgesics, antiemetics, etc…

For example, a lady was diagnosed with invasive squamous cell carcinoma of cervix. she was complaining of lower limb swelling due to lymphedema or sciatic pain and foot drop, or with investigation she had hydronephrosis, we can diagnose her clinically as stage 3B. Some patient may die due to renal failure not from cervical cancer itself

- Another example, a lady was diagnosed with invasive squamous cell carcinoma of cervix. Her Pelvic examination revealed thickening of the right parametrium but not out to the lateral Sidewall. we can diagnose her clinically as stage 2B.
- Another example, a lady was diagnosed with invasive squamous cell carcinoma of cervix. she was complaining of passing stool through vaginal opening. we can diagnose her clinically as stage 4A.
- In case of 1A1 is depend of age and parity, if she is a young lady who is planning to have kids, we go to cone biopsy with negative margins, if she is elderly women who completed her family we go to simple hysterectomy.
- The same from stage 1A2-2A2, we will go for radical hysterectomy if she is elderly women, and in young women with low parity we go for trachelectomy which is a surgical procedure used to treat eligible women with early stage cervical cancer by removing only the cervix, upper vagina and parametrium.
- 4B it is a palliative care which could be comfort care with analgesic and antiemetic or

- could be chemotherby or surgery to decrease the accelerate of disease and expand the life a little bit. For example, we can do palliative hysterectomy for those who complain of vaginal bleeding but that will not cure the patient.
- It is good for the patient if she presents with early stage so we cure her, because unlike other gynecological cancer un in second stage we cannot do a surgery and we go for chemoradiation. In cervical cancer the Main presenting complaint is postcoital bleeding
- The indication for chemoradiation in cervical cancer (positive margins, positive lymph node, positive parametria. If they are negative patient does not need radiation and the follow up after surgery it is enough.
- The follow up, the first two years every 3 months, the next three years every 6 months.

2. Ovarian neoplasms:

- ***Done by Luluh Alzeghayer,435 <3***

	Epithelial tumors (80%)	Germ-cell tumors	Sex-cord tumors
	> 50 y.o. Aggressive Present late at stage 3 or 4	young pts. Very aggressive	very young pt. May recur after 40 years > follow up for life
Types	**Serous cystadenocarcinoma** "Most common" Tumor marker: CA 125	**Dysgerminoma** Tumor marker: LDH	**Granulosa cell tumor** Tumor marker: inhibin & AMH secretes estrogen
	Mucinous cystadenocarcinoma Tumor marker: CA 199 and CEA	**Yolk sac (endodermal sinus)** Tumor marker: AFP	**Sertoli- Leydig cell tumor**
	Rare types: Clear cell / endometriod cancer	**Immature teratoma** Tumor marker: non specific, AFP	Very aggressive
Dx.	• **CT scan** may show Omental cake[6] or Peritoneal carcinomatosis. If these lesions are present you can take a biopsy. If not, don't take a biopsy from an ovarian lesion as it may spread. • **Cytology, Omental and peritoneal biopsy**		
Rx.	3 cycles of neoadjuvant chemo > interval **debulking (cytoreduction)**[7] > 3 cycles of adjuvant chemo **Or:** primary debulking > 6 cycles of adjuvant chemo	**Unilateral salpingo oophorectomy** Stage 2 and above = + chemotherapy [8] (3-4 cycles)	**Unilateral salpingo oophorectomy** Stage 1c and above = + chemotherapy **pt>40 = TAH-BSO**
	Debulking: Suboptimal > 2 cm left (useless!). Optimal < 2 cm left. Complete < 1 cm left. Radical = 0cm.		

- Epithelium ovarian tumor :
  - Debulking (cytoreduction) = TAH-BSO + LN removal + omentectomy + any visible disease.
  - They present with Nonspecific symptoms: abdominal distension, ascites, intestinal obstruction, paraneoplastic syndrome e.g. weight loss.
  - the most common stage at the presentation in patient with ovarian tumor? Stage 3: peritoneal metastasis.
  - **What are the markers for ovarian tumor?**
- What are the risk factors for ovarian tumor?
  - Nulliparity, because with every ovulation there is trauma and injury to epithelial line.
  - Any thing interfere with ovulation is protective such as multiparity, pregnancy, hysterectomy and OCP.
  - Familial history which associated with ovarian tumors:
    - BRCA1&2. Risk of breast CA in both is 60-80%. Risk of ovarian CA in BRCA1=40%, BRCA2: 20%
    - Lynch syndrome (cancer of colon 60-80%, ovaries 5-10%, endometrium 40%, bladder, ureter, biliary, brain)
- The survival rate in ovarian cancer depends on outcome of debulking.
- After the debulking we follow up the patient in the clinic with tumor markers.
- The omentum is a common site for recurrence.
- It is contraindicated to take the biopsy from the ovary because you will spread the tumor and upstage the disease.
- The management for both types (serious and mucinous) is the same, except that in mucinous type we do appendicectomy to remove the appendix as a part of surgery, because most of mucinous cancer are arise from GI origin until proven otherwise.
- We have to do CT scan for chest, abdominal and pelvic for all patient.

NON-Epithelium ovarian tumor

- What is the most common germ cell tumor? it used to be dysgerminoma but now it is immature teratoma.
- they are total opposite in prognosis, dysgerminoma is curable with good prognose while immature teratoma is on of the worst tumor which affect young which cause death and very bad prognose.
- schiller duval bodies is special histopathological finding in yolk sac tumor.
- What is the most common sex cord tumor? Granulose cell tumor, its tumor marker is inhibin.
- Call-Exner bodies is special histopathological finding in Granulose cell tumor.
- What is special about granulosa cell tumor ?
    1. 1-It is Estrogen secreting tumor, so the patient will present either with vaginal bleeding or breast tenderness which are sign of excessive estrogen, beside high inhibin level.
    2. 2-Also we have to do endometrium biopsy because she has a risk for developing endometrium cancer.
    3. 3- in addition, the follow up will be for life, because the risk of recurrence is high even after 35 years.
- If the patient present with hirsutism we will think about Sertoli Leydig cell tumor which is testosterone secreting, and it is a type of sex cord tumor.

Metastatic ovarian cancer:

Krukenberg tumors: which mean metastatic tumors come from somewhere else to the ovary. the most common is metastatic from the stomach. In all cases are stage 4, and the management depend on the origin.

Borderline tumors (non-invasive but can metastasized):

- It lies between benign and malignant and feature from both. So it does not invade like benign lesion but at the same time it metastasizes like malignant.
- Good prognosis (80-90%). But may recur as low-grade malignant tumor.
- They don't respond to chemo nor radiation, the gold standard is surgical resection.

3. Endometrium neoplasms:

Done by Luluh Alzeghayer,435 <3

	Type 1 cancer	Type 2 endometrial cancer
Risk factors	DM, HTN, PCOS, nulliparity, infertility, obesity [9], younger pt.	No specific risk factors! (not related to hyperestrogenism) Postmenopausal patients
Histopathology	Low grade endometriod cancer	• High grade endometriod cancer • Papillary / Clear cell carcinoma
Management	**TAH-BSO** + pelvic LN excision	**TAH-BSO** + pelvic and para-aortic LN excision + omentectomy

- 90% of patients present early (stage 1) due to AUB (abnormal uterine bleeding).
- Most common cause of AUB in postmenopausal women is genital atrophy.
- Perform endometrial biopsy for any patient with AUB whose age > 40 especially postmenopausal.
- Those with strong risk factors such as obesity and PCOS or family history even if they are younger than 40 we will endometrial biopsy.
- Any young women who diagnosed with colon cancer should be screened for other gynecological cancer.

The results of biopsy

- It could be Normal, Cancer or precancerous abnormality (Hyperplasia)
- Risk of progression of hyperplasia (premalignant) to malignancy:
- Simple hyperplasia without atypia: 1% with atypia (x10): 10%
- Complex hyperplasia without atypia: 3% with atypia (x10): 30%
- We have to do CT CAP (chest, abdominal,pelvic), if the biopsy shows cancer.

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Staging is surgical (histopathological after surgical biopsy):

Stage	Characters	Management
1A	Endometrial invasion < 50%	**TAH-BSO** No need for neoadjuvant chemo or vaginal brachytherapy[10].
1B	Endometrial invasion > 50%	TAH-BSO **+ vaginal brachytherapy**
2	Extension to the cervix	**Radical** hysterectomy + BSO + pelvic lymphadenectomy Or Pelvic radiation followed by simple hysterectomy (both options are valid) Staging + **+ chemotherapy (6 cycles)** + radiotherapy
3A	Invasion of ovaries, tubes, or serosa.	
3B	Invasion of parametrium or vagina.	
3C1	Pelvic LN	
3C2	Para-aortic LN	
4A	Bladder / rectum	
4B	Distant metastasis.	**Palliative therapy:** chemotherapy or supportive care

- Brachytherapy is a form of radiotherapy to the top part of vagina which is the most common site for recurrence.
- Stage 2 is unique, it involves the cervix, and we may find a lesion during examination. We manage it like cervical cancer by two ways, either by radical hysterectomy with removal of parametrium. Or external beam radiation followed by simple hysterectomy.
- in the endometrium either chemo or radiation not both together, unlike cervical cancer which start with chemo to sensitize the tissue then radiation.

Patient with benign changes want to preserve fertility:

- Benign changes can be treated by prophylactic hysterectomy or high dose progesterone.
- High dose progesterone for treating a patient with low grade endometroid endometrial cancer (80% response to treatment)
- Conditions: low parity and wish to preserve fertility, grade 1 endometroid endometrial cancer, no myometrial invasion, LN< 1 cm on MRI (MRI is used instead of surgical biopsy).
- Follow up in 3 months, if biopsy is -ve, refer to IVF. if still +ve, double the dose of progesterone and repeat the biopsy in 3 months. If she is still +ve, repeat MRI, if still showing no lymphadenopathy and no myometrial invasion, continue medical treatment for 3 more months. After these 9 months from diagnosis), if still +ve, medical therapy failed, and patient has to undergo complete surgical staging.

4. GTD & GTN neoplasms:

Gestational trophoblastic disease (GTD):

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Complete mole	Incomplete mole
Fertilization of **EMPTY ovum** with 2 sperms or 1 sperm that will divide later on	Fertilization of **normal ovum** with 2 sperms or 1 sperm that will divide later on
No fetal components	**fetal components present**
5-15% risk of malignancy	<1% risk of malignancy
Most common genetic 46 XX - followed by 46 XY	**Most common genetic 69 XXY - followed by 69 XXX**

- Most common Presentation: Large uterus, vaginal bleeding, hyperemesis gravidarum, thyrotoxicosis (because bHCG has the same alpha subunit of TSH).
- **Diagnosis:** Quantitative b-HCG: extremely high bHCG levels.
- **Can be seen in US:**
  - snowstorm appearance (COMPLETE MOLE)

- hydropic villi, theca lutein ovarian cysts (no need to treat them, they regress after resolution of GTD)
- part of fetus or gestational sac can be seen (INCOMPLETE MOLE), it is similar to missed abortion where they can find part of fetus after abortion.

- **How the Patient should be followed? and why?**
  weekly with b-HCG until 3 consecutive -ve results then monthly for 6 months. Because the recurrence and there is a risk to change into GTN.
- **Which type, we need to give Anti-D if the mother is O- ?** Incomplete molar, because there is fetus.
- During the follow up, we give them OCP to avoid confusion regarding the source of high b-HCG

Gestational trophoblastic Neoplasia (GTN):

- it is the only neoplasia we treat it without any biopsy or histopathogy to diagnose.
- We do not take a biopsy because the diagnose is clear with context
- **How can I know, it is changing to GTN?**
  - b-HCG is not dropping as expected, plateauing or rebounding, or
  - If still +ve after 6 months from the time of evacuation, or
  - If histopathology after the evacuation of molar pregnancy came +ve for choriocarcinoma or Invasive mole.
- **What are the types?**
  1. Invasive mole (in the uterus but start to invade)
  2. Choriocarcinoma (it can be metastasized to brain, liver, and most commonly lung)
  3. Both responds to chemo 95% with an excellent prognosis.
  4. Placental site trophoblastic tumours (PSTTs): High b-HCG + high HPL in post-partum women = Placental site trophoblastic until proven otherwise.
- After miscarriage or normal pregnancy or term (not after molar).
- b-HCG is high (usually in few thousands), but not as high as molar
- Human placental lactogen (HPL) is elevated.
- US: highly vascular lesion.
- Biopsy (D&C), sometimes -ve (difficult diagnosis)
- Locally invasive, doesn't metastasize. Resistant to chemo and radiotherapy.
- Rx. : hysterectomy or wedge resection to preserve fertility if low or no parity.
- b-HCG, CXR, CT BRAIN, ABDOMEN, USS PELVIS ARE USED TO DEFINE THE SCORE AND THE STAGE.
- You don't have to know the detail of score, just know the cut point is 7 , it is diveded into two groups low risk and high risk.
- The good thing about GTN is chemo and radio sensetive, but never give radio because you will destroy both ovary and endometrium.

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Management:

GTD	GTN	
Complete & incomplete	**Low score (<7)**	**High score (7-12)**
Suction evacuation (+gentle curettage to avoid perforation)	**Single agent chemo:** MTX or Actinomycin D	**Multiple agents chemo:** EMACO[11]
Follow up every week until 3 -ve bhCG, then every month for 6 months.	Follow up for 1 year (Patient should be followed weekly with bhcg until 3 consecutive -ve results then monthly for 12 months).	Follow up for 2 years (Patient should be followed weekly with bhcg until 3 consecutive -ve results then monthly for 24 months).
Hormonal Contraception for 6 months. IUD is allowed when bhcg is zero.	Hormonal Contraception for 1 year. IUD is allowed when bhcg is zero.	Hormonal Contraception for 2 years. IUD is allowed when bhcg is zero.