PREP XI RR

STUDY NOTES

GYNAECOLOGY & OBSTETRICS

13
VIDEOS

286
PAGES

PREMIUM STUDY MATERIAL

PREP XI RR

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1. CLINICAL ANATOMY

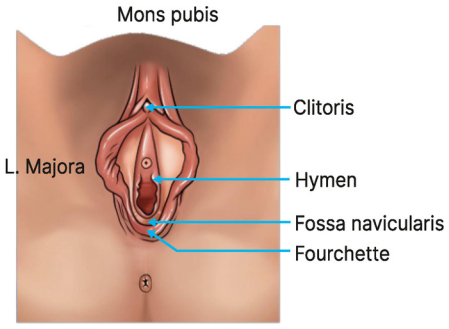
BIG QUESTION 1: What are the components and clinical anatomy of the external female genitalia?

Broad Answer: The external female genitalia, collectively referred to as the vulva or pudendum, include the mons pubis, labia majora, labia minora, clitoris, vestibule, hymen, fossa navicularis, and fourchette. Each component has distinct anatomical, histological, and clinical relevance, including homologous relationships to male structures, blood and lymphatic drainage, and associated pathologies.

DETAILED QUESTIONS

Q1.1: What structures are included in the external genitalia (vulva)?

Answer:



- Mons pubis
- Labia majora
- Labia minora
- Clitoris
- Vestibule
- Hymen
- Fossa navicularis
- Fourchette (2 labia majora join together posteriorly)

Q1.2: Briefly describe the main external genital structures in females.

Answer:

- **Mons pubis:** Triangular area of hair-bearing skin overlying the pubic symphysis
- **Labia majora:** Outer hair-bearing folds of skin
- **Labia minora:** Inner hairless folds of skin
- 2 Labia minora fuse posteriorly to form the fourchette
- Vestibule: Area bounded by labia minora on both sides i.e., clitoris in front, and fourchette posteriorly

Q1.3: Embryologically, which female genital structure is homologous to which male genital structure?

Answer:

Structure	Homologous Male Structure
Labia majora	Scrotum
Labia minora	Ventral shaft of penis
Clitoris	Glans penis
Skene's glands	Prostate gland
Bartholin's	Cowper's glands

Q1.4: What structures open into the vestibule?

Answer:

- Urethra (anteriorly)
- Vagina (posteriorly)
- Skene's (paraurethral) gland ducts
- Bartholin's gland ducts

Q1.5: What is the lining epithelium of vestibule and hymen?

Answer:

- Non-keratinized stratified squamous epithelium

Q1.6: What are the anatomical and clinical details of Bartholin's glands?

Answer:

- Located in superficial perineal pouch, beneath the labia
- Duct opens outside hymen at junction of anterior 2/3rd and posterior 1/3rd
- Secretes alkaline mucus at time of coitus
- Identification of Bartholin's gland swelling by location → postero-laterally on vulva
- Clinical relevance:
  - Opening of duct gets blocked by cellular debris, mucus debris, infection → content accumulated inside → cystic swelling
  - Contents of cyst can get infected → excruciating pain, fever, tenderness, warm and red → leading to abscess formation
  - Common pathogens: E. coli, Chlamydia, Gonorrhea
  - Treatment:
    - → Bartholin's gland cyst: Marsupialization
    - → Bartholin's abscess: Incision and drainage
    - → Solid swelling in women >40 years: Consider malignancy → Excision



Q1.7: What is hidradenoma of vulva?

Answer:

- Benign tumor of apocrine sweat glands
- Seen in labia majora, absent in labia minora

Q1.8: What is the anatomical relevance of round ligament termination and canal of Nuck?

Answer:

- **Round ligament:** Originates from uterine cornua, travels in inguinal canal, ends in anterior labia majora
- **Canal of Nuck:** Obliterated vaginal process

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Q1.9: What are carunculae myrtiformes?

Answer: Remnants of hymen seen after childbirth

Q1.10: What is fossa navicularis?

Answer: Space between hymen and fourchette

Q 1.11: What is hymen?

Answer: Membranous covering of introitus

Q1.12: Write briefly about the anatomical features of Bartholin's/Greater vestibular glands.

Answer:

- Homologous to Cowper's glands in males
- Located in superficial perineal pouch underneath labia
- Duct opens just outside hymen at junction of anterior 2/3rd and posterior 1/3rd

BIG QUESTION 2: What is the vascular, lymphatic, and neural supply of the vulva, and its clinical relevance?

Broad Answer: The vulva has a complex blood supply from branches of the femoral and internal iliac arteries, lymphatic drainage primarily to inguinofemoral nodes, and sensory innervation from both lumbar and sacral plexuses. This distribution is relevant in surgery, cancer spread, and regional anesthesia.

DETAILED QUESTIONS

Q2.1: What is the arterial blood supply of the vulva?

Answer:

Region	Artery	Source
Vulva	Internal pudendal artery (majorly)	Branch of anterior division of internal iliac
Mons pubis	External pudendal artery	Branch of femoral artery

Q2.2: What is the lymphatic drainage of the vulva?

Answer:

Region	Lymph Nodes
General vulva	Superficial inguinal → Deep inguinal → Pelvic
Clitoris	May directly drain to deep inguinal
Midline structures • Clitoris • Fourchette • Anterior portion of Labia Minora	Drain bilaterally to both sides of inguinofemoral lymph nodes

- **Cloquet's node (Rosenmuller's):** Superior-most node of deep inguinal group, located in femoral canal
- **Clinical:** Vulval cancers can involve inguino-femoral lymph nodes; midline cancers involve bilateral inguinal lymph nodes

Q2.3: What is the nerve supply to the vulva?

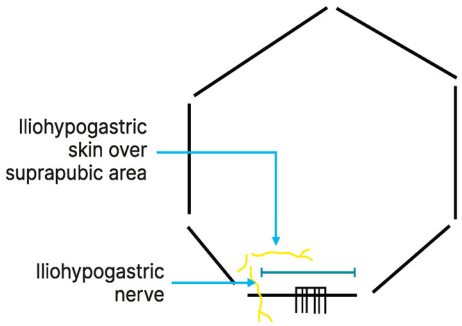
Answer:

Region	Nerve	Plexus
Anterosuperior	Ilioinguinal, Genital branch of genitofemoral	Lumbar plexus
Posteroinferior	Posterior cutaneous nerve of thigh	-
Mainly	Pudendal nerve	Sacral plexus

Q2.4: What is the sensory cutaneous nerve supply of the vulva?

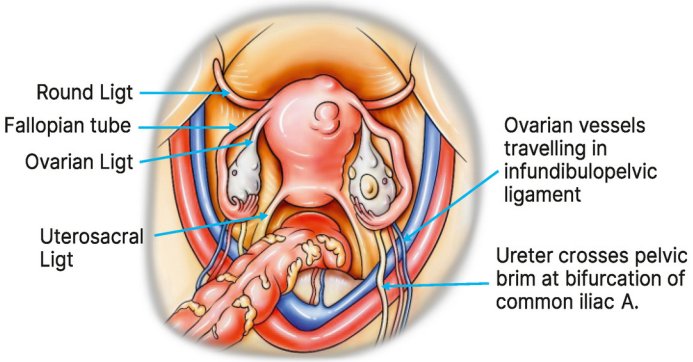
Answer:

- **Ilioinguinal nerve:** Skin over mons pubis, upper labia minora
- **Iliohypogastric nerve:** Skin over suprapubic area
- **Pfannenstiel incision (Low transverse incision of abdomen):** If extended laterally, can injure ilioinguinal and iliohypogastric nerves → Later presents with sensory disturbance, tingling, numbness in their area of distribution



BIG QUESTION 3: What are the anatomical features, measurements, and relations of the internal female genitalia?

Broad Answer: Internal female genitalia include the uterus, cervix, fallopian tubes, ovaries, and their supporting ligaments. Their position, measurements, and anatomical relations are essential in diagnosis, surgery, and understanding pathological conditions such as uterine malposition and ureteric injury.



DETAILED QUESTIONS

Q3.1: What structures are found at the uterine cornu (from anterior to posterior)?

Answer:

- Round ligament
- Fallopian tube
- Ovarian ligament (attaches uterine cornu to ovary)

Q3.2: What helps identify the fallopian tube if the fimbrial end is not visualized?

Answer:

- Ovarian ligament and round ligament orientation helps trace back to the uterine cornu and tube.

Q3.3: What ligament carries ovarian vessels, and where does it attach?

Answer:

- Infundibulopelvic ligament (suspensory ligament of ovary)
- Connects ovary to lateral pelvic wall

Q3.4: What is the anatomical path of the ureter?

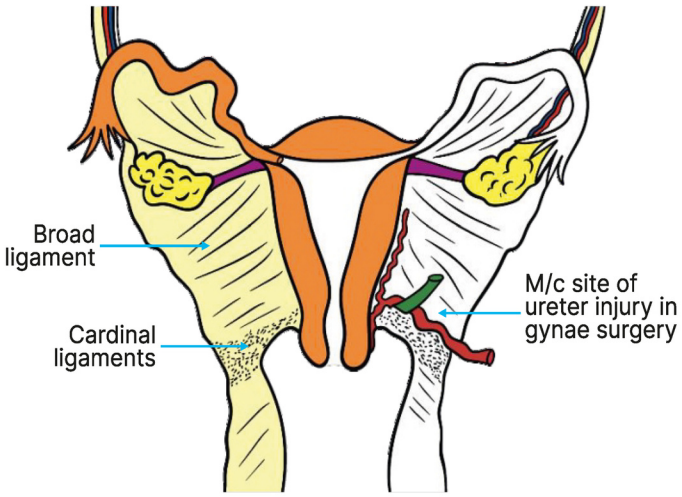
Answer:

- Crosses the pelvic brim at the bifurcation of the common iliac artery
- Lies posterior to the infundibulopelvic ligament
- Crosses under the uterine artery ~1.5 cm lateral to the cervix

Q3.5: What is the most common site of ureteric injury in gynecological surgeries?

Answer:

- At its crossing with the uterine artery about 1.5 cm lateral to cervix



Q3.6: What are the components and orientation of the broad ligament?

Answer:

- Double-layered peritoneal fold
- Contains uterine tube, uterine vessels, ligament of ovary, round ligament, ureter
- Does not provide direct support to the uterus

Q3.7: What are the anatomical parts and measurements of the uterus?

Answer:

- Uterocervical length: 6-8 cm
- Divided into: Corpus (body) and Cervix

Q3.8: How does the ratio of body to cervix vary with age?

Answer:

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Stage	Body: Cervix Ratio
Before puberty	1:2
Reproductive age	3:1
After menopause	1:1

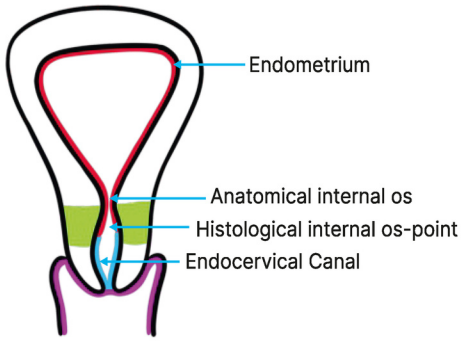
Q3.9: What are the key supporting ligaments of the uterus?

Ligament	Description
Infundibulopelvic	Carry ovarian vessels for blood supply of ovaries
Round ligament	Maintains anteversion; ends in labia majora
Ovarian ligament	Connects ovary to uterus
Cardinal ligaments/ Transverse cervical ligament/ Mackenrodt ligament	Ligaments extending from the sides of cervix to lateral pelvic wall
Uterosacral ligament	Structure extending from cervix and going towards sacrum

Q3.10: What is the isthmus and its clinical relevance?

Answer:

- Region between anatomical and histological internal os
- Histological internal os = Point where epithelial lining changes from endometrium to endocervical epithelium
- During labor: Forms lower uterine segment (LUS)
  - Measures ~5cm at term and ~10 cm during labor



Q3.11: What defines the normal position of the uterus?

Answer:

- Normal position of uterus: Anteversion and Anteflexion
- Angle of anteversion: angle between long axis of vagina and long axis of cervix - 90°
- Angle of anteflexion: angle between long axis of cervix and body of uterus - 120°
- Ligament preventing retroversion: Uterosacral ligaments

Q3.12: What is the importance of the uterosacral and cardinal ligament complex?

Answer:

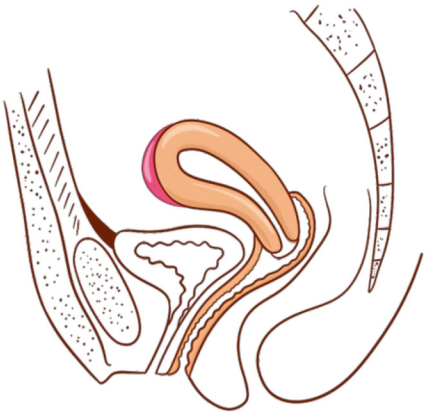
- Helps maintain position of uterus
- Helps suspend external os at level of ischial spine

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BIG QUESTION 4: What are the peritoneal reflections, fornices, and clinical procedures involving the posterior fornix?

Broad Answer: The peritoneum reflects over pelvic organs creating anatomical spaces such as the uterovesical pouch anteriorly and the pouch of Douglas posteriorly. The posterior fornix of the vagina, being the deepest, allows surgical access to the peritoneal cavity for drainage or biopsy.



Sagittal view of pelvis

DETAILED QUESTIONS

Q4.1: What is the anterior peritoneal reflection and where is it identified?

Answer:

- Aka Serosal reflection/ Serosal coverings
- Located at the level of the isthmus
- Identified as a loose fold of peritoneum during cesarean section or hysterectomy
- Marks the superior border of the lower uterine segment (LUS)

Q4.2: Where does the posterior peritoneal reflection extend?

Answer:

- Extends lower than anteriorly
- Reaches the upper part of the vagina

Q4.3: What is the pouch of Douglas and its clinical importance?

Answer:

- Also called cul-de-sac
- Located between 2 uterosacral ligaments
- Most dependent part of female pelvis in upright position
- First site for fluid or blood collection
- Peritoneal cavity in region of pouch of Douglas approached via vagina - vagina not covered by serosal covering anywhere except at POD

Q4.4: What is the posterior fornix and its anatomical relevance?

Answer:

- Deepest of the vaginal fornices

Q4.5: What clinical procedures access the pouch of Douglas through the posterior fornix?

Answer:

- **Culdocentesis:** Introducing a needle and aspirating contents
- **Colpotomy:** Incision made in posterior vaginal fornix to reach POD

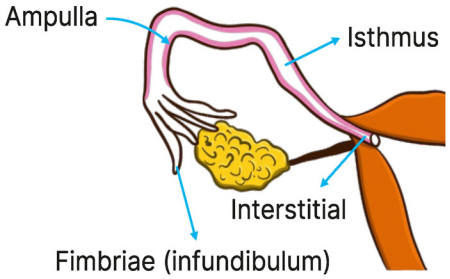
BIG QUESTION 5: What are the anatomical parts, histology, and clinical relevance of the fallopian tubes?

Broad Answer: The fallopian tube (also known as the uterine tube or oviduct) consists of four anatomically and functionally distinct parts. It plays a vital role in gamete transport, fertilization, and embryo transfer. Disruption in its structure or function can lead to infertility or ectopic pregnancy.

DETAILED QUESTIONS

Q5.1: What are the anatomical parts of the fallopian tube?

Answer:



Q 5.2: What is the narrowest part of fallopian tube?

Answer:

Interstitial part > Isthmus

Q5.3: What is the histological lining of the fallopian tube?

Answer:

- Lined by ciliated columnar epithelium
- **Contains:**
  - Secretory cells
  - Supporting cells - peg cells/Intercalary cells - later on transform into secretory cells (exact function not known)

Q5.4: What is the mechanism of conceptus transport through the tube?

Answer:

- Tubal peristalsis is the primary mechanism
- Ciliary beating assists movement toward uterus

Q5.5: What happens when the tubal mucosa is damaged?

Answer:

- Seen in conditions like Pelvic Inflammatory Disease (PID)
- Results in hampering of movement of conceptus towards uterine cavity as peristalsis is hampered and cilia may be damaged

- Can lead to:
  - Infertility
  - Ectopic pregnancy

Q5.6: What are the sites of fertilization and ectopic implantation?

Answer:

Event	Common Site
Fertilization	Ampulla
Tubal ligation	Isthmus
Tubal ectopic	Ampulla (most common)

Q5.7: Which is the widest and longest part of the fallopian tube?

Answer: Ampulla

BIG QUESTION 6: What are the histological features of the vagina and cervix, and how is vaginal pH regulated?

Broad Answer: The vaginal and cervical epithelia vary in cell type and secretory characteristics. Vaginal pH is maintained by estrogen and lactobacilli, creating an acidic environment during reproductive years. The cervix exhibits histological transitions that form the basis of the transformation zone, where metaplasia and neoplasia often occur.

DETAILED QUESTIONS

Q6.1: What is the epithelial lining of the vagina?

Answer:

- Non-keratinized stratified squamous epithelium
- Devoid of glands

Q6.2: What is the source of vaginal secretions?

Answer:

- Endocervical secretions
- Transudation of fluid across epithelium

Q6.3: What is the normal vaginal pH in various age groups or conditions?

Condition	Vaginal pH
Reproductive age	3.5-4.5
Menses	6-8
Childhood	6-8
Postmenopausal	6-8

Q6.4: What maintains the acidic pH of the vagina?

Answer:

- Normal commensal bacteria: Lactobacilli (Doderlein's bacilli)
- Estrogen effect → proliferation of superficial epithelial cells → rich in glycogen → fermented by lactobacilli → produces lactic acid

Q6.5: What are the epithelial lining of the cervix?

Region	Epithelium Type
Ectocervix (Part of cervix protruding out in vagina)	Stratified squamous epithelium
Endocervical canal (red epithelium)	Columnar epithelium

BIG QUESTION 7: What is the blood supply of the internal female genitalia and how is postpartum hemorrhage prevented?

Broad Answer: The uterus, ovaries, fallopian tubes, and vagina receive blood from the ovarian, uterine, and pudendal arteries. The uterine artery has multiple branches, including arcuate and radial arteries, which supply the endometrium and myometrium. Uterine contraction compresses these vessels to prevent postpartum hemorrhage.

DETAILED QUESTIONS

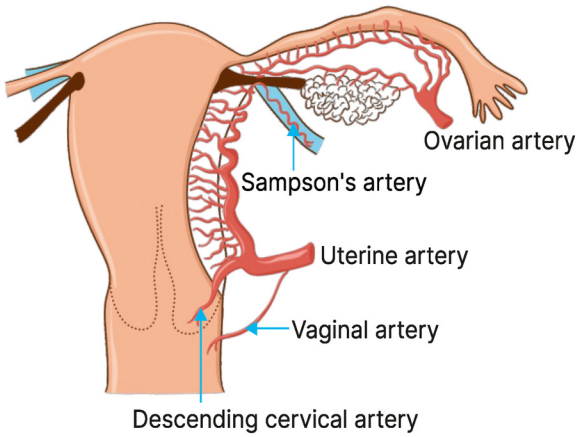
Q7.1: What is the main blood supply to each organ?

Structure	Artery	Source
Ovary	Ovarian artery	From Aorta
Uterus	Uterine artery	Anterior division of internal iliac
Lower 1/3 of vagina & vulva	Internal pudendal artery	Anterior division of internal iliac
Lateral fallopian tube	Ovarian artery branches	From aorta
Medial fallopian tube	Uterine artery branches	From internal iliac

Q7.2: What are the branches of the uterine artery?

Answer:

- Descending cervical artery
- Sampson's artery: artery for round ligament of uterus
- Vaginal artery: Can arise from internal iliac artery also

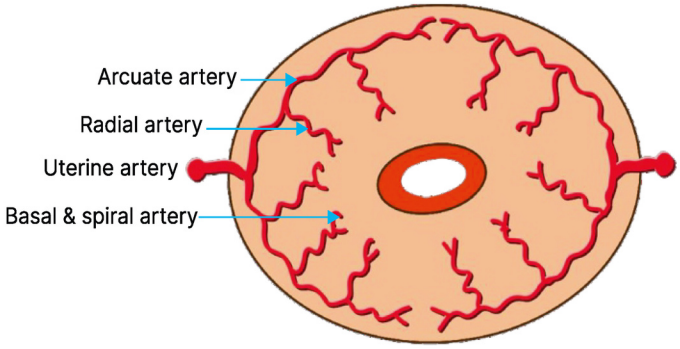


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Q7.3: What is the vascular branching pattern in the uterus?

Answer:

- Uterine artery → **Arcuate artery:** Forms an arc around the myometrium
- Uterine artery → Radial artery → **Terminal branches:**
  - **Basal artery:** Supplies the deeper 1/3rd - basalis layer of endometrium
  - **Spiral artery:** Supplies the superficial 2/3rd - functional layer of endometrium



CS of Uterus

Q7.4: What is the clinical relevance of uterine vasculature during labor?

Answer:

- Middle layer of myometrium → living ligature as muscle fibers are in criss-cross pattern and branches of radial artery travels in between criss-cross fibers
- Uterine contraction → compresses blood vessels → reduces bleeding
- Most important factor preventing postpartum hemorrhage (PPH) is effective uterine contraction

BIG QUESTION 8: What are the clinical correlates of the cervix and the types and steps of hysterectomy?

Broad Answer: The appearance of the cervical os varies with parity, and different types of hysterectomy are performed depending on the clinical context. Each procedure has specific steps and carries a risk of ureteric injury, especially during extensive dissections.

DETAILED QUESTIONS

Q8.1: What is the appearance of the external OS in different parities?

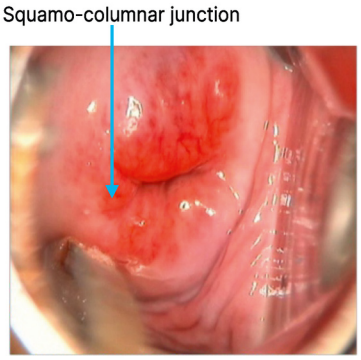
Answer:

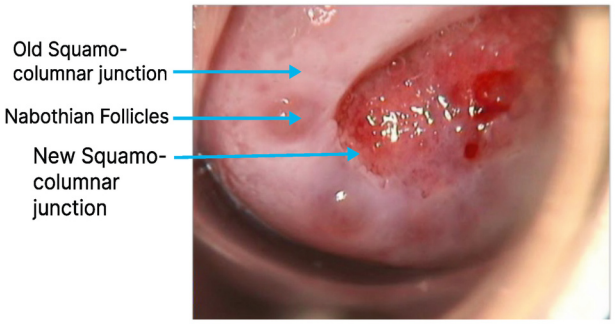
Patient Type	Cervical Os Appearance
Nulliparous	Pin-point
Multiparous	Transverse slit-like

Q8.2: What are the epithelial types in the cervix and their transformation?

Answer:

- **Ectocervix:** Stratified squamous epithelium (same as vaginal lining)
- **Endocervical canal:** Columnar epithelium (appears red)
- **Squamo-columnar junction:** Initially at periphery
- With squamous metaplasia, junction shifts toward the external os
- **Transformation zone:** Area between old and new junction; most common site for CIN and cervical cancer





Ectocervix

Q8.3: What is a Nabothian follicle?

Answer:

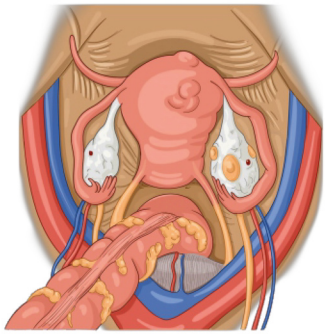
- Physiological, can enlarge and give cystic appearance
- Seen in area of the old squamocolumnar junction

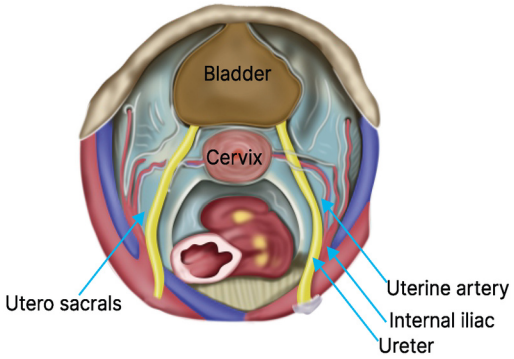
Q 8.4: What is hysterectomy?

Answer: Surgery in which uterus is removed

Q8.5: What are the types of hysterectomy and what is removed in each?

Type	Description
Subtotal (Supracervical)	Only the body of the uterus is removed; cervix retained. E.g.: During peripartum hysterectomy, hysterectomy for PPH, around time of delivery for PPH
Total hysterectomy	Body + cervix removed Simple/type I/Extra facial hysterectomy: Uterus, body of uterus, cervix along with covering fascia removed
Simple/Type I/Extrafascial	Uterus, cervix, and covering fascia removed
Radical	Parametrium area (connective tissue surrounding uterus) removed Done in cancer surgeries
Modified Radical/Type II/Wertheim's	More lateral dissection: part of parametrium + uterosacrals removed
Type III/Meig's	Even more lateral dissection, chances of ureter injury





Q8.6: Which type of hysterectomy is most commonly associated with ureteric injury?

Answer:

- Simple hysterectomy (most commonly performed)

Q8.7: Which type has the highest risk of ureteric injury?

Answer:

- Radical hysterectomy

Q8.8: What is the most common type of ureteric injury during hysterectomy?

Answer:

- Crushing injury

Q8.9: What is the sequence of clamping in abdominal and vaginal hysterectomy?

Approach	Clamp Sequence
Total abdominal	Tubo-ovarian pedicle → Uterine artery → Cardinal/uterosacral
Vaginal hysterectomy	Reverse of abdominal sequence

Q8.10: What ligaments are cut during hysterectomy?

Ovarian Preservation	Ligaments Cut
Ovaries preserved	Ovarian ligament
Ovaries removed	Infundibulopelvic ligament (IP ligament)

BIG QUESTION 9: How is the female reproductive system innervated, and what are the clinical applications of nerve blocks for pain relief in obstetrics and gynecology?

Broad Answer: The female reproductive organs receive complex nerve supply from sympathetic and parasympathetic plexuses, contributing to distinct pain referral patterns. Understanding this innervation is crucial for effective pain management strategies in labor and gynecological procedures, utilizing techniques like epidural, paracervical, and pudendal nerve blocks.

DETAILED QUESTIONS

Q9.1: What is the sympathetic nerve supply to the ovaries and outer two-thirds of the fallopian tube?

Answer: The ovaries and outer two-thirds of the fallopian tube receive sympathetic innervation via the renal and aortic plexuses, corresponding to the T9-T10 spinal segments.

Q9.2: What is the sympathetic nerve supply to the uterus and proximal fallopian tube?

Answer: The uterus and proximal fallopian tube receive sympathetic innervation to the T11-T12 to L1 spinal segments via the Inferior hypogastric plexus (Frankenhauser ganglia).

Q9.3: How is pain from uterine contractions referred to?

Answer: Pain of uterine contraction is referred all over the abdomen.

Q9.4: What is the pathway for pain fibers from the upper vagina, cervix, and lower uterine segment (LUS)?

Answer: Pain fibers from the upper vagina, cervix, and LUS travel via the parasympathetic pelvic splanchnic nerves (S2, S3, S4).

Q9.5: Where is the pain of cervical dilatation referred?

Answer: Pain of cervical dilatation is referred to the back side.

Q9.6: Which nerve supplies the perineum, vulva, and lower vagina?

Answer: The perineum, vulva, and lower vagina are supplied by the pudendal nerve (S2, S3, S4).

Q9.7: What is considered the best labor analgesia, and at what level is it typically blocked?

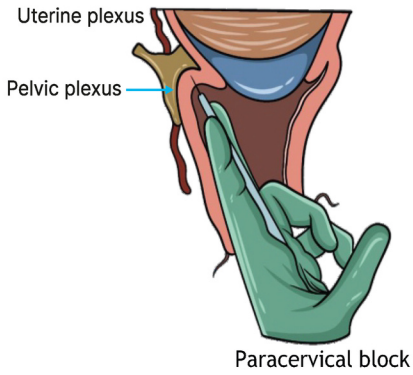
Answer: The best labor analgesia is epidural analgesia, and the typical level of block for labor is T10.

Q9.8: At what level is the epidural block placed for a C-section, and why?

Answer: For a C-section, the epidural block is placed at T4, because the parietal peritoneum needs to be blocked.

Q9.9: What is a Paracervical block used for, and what pain does it relieve?

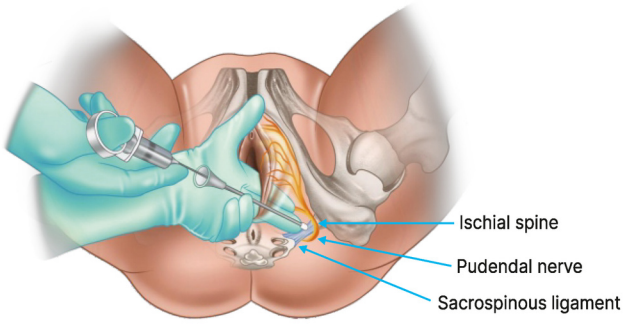
Answer: A Paracervical block provides satisfactory pain relief during cervical dilatation, as seen in the first stage of labor or surgical MTP procedures.



Q9.10: What is a Pudendal nerve block used for, and how is it performed?

Answer:

- A Pudendal nerve block provides pain relief during the second stage of labor by blocking pain fibers traveling from the lower part of the birth canal.
- It is performed by piercing the sacrospinous ligament and administering local anesthesia behind it.



Q9.11: What are critical anatomical considerations when performing a Pudendal nerve block to avoid complications?

Answer:

- When performing a Pudendal nerve block, one must remain medial to the level of the ischial spine, as the pudendal nerve and pudendal vessels are located just behind it.
- Injury to these structures can lead to systemic toxicity of the local anesthetic.

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Q9.12: For which procedures is a Pudendal nerve block ineffective?

Answer:

- A Pudendal nerve block is ineffective for exploration of the cervix, upper vagina, and uterine cavity.

2. REPRODUCTIVE PHYSIOLOGY AND CLINICAL CONDITIONS

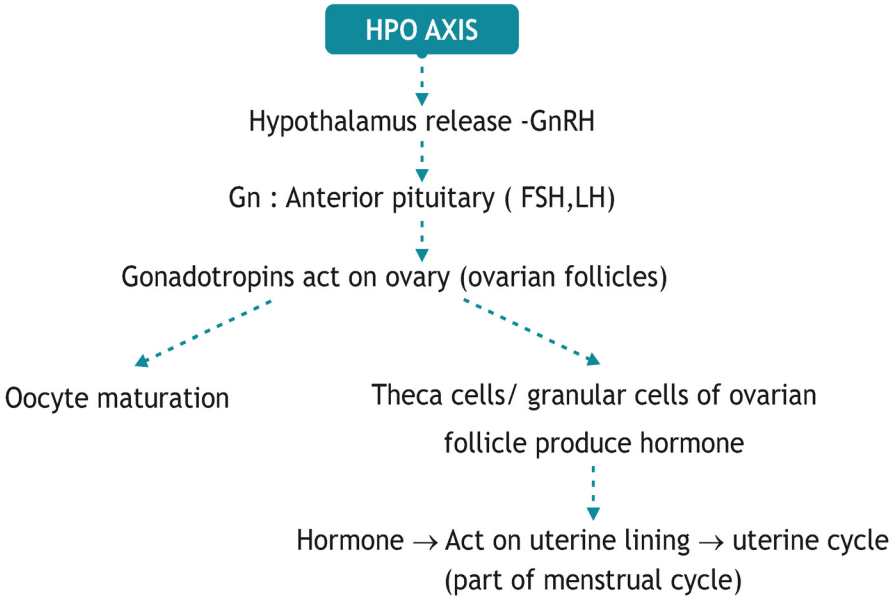
BIG QUESTION 1: Explain the role of the Hypothalamo-Pituitary-Ovarian (HPO) axis in oogenesis and female reproduction.

Broad Answer: The HPO axis regulates reproduction by pulsatile GnRH release from the hypothalamus, stimulating FSH and LH from the anterior pituitary, which act on ovarian follicles to drive oocyte maturation and hormone secretion. Estrogen and progesterone from the ovary prepare the endometrium for implantation, while oogenesis begins in fetal life and completes only if fertilization occurs

DETAILED QUESTIONS

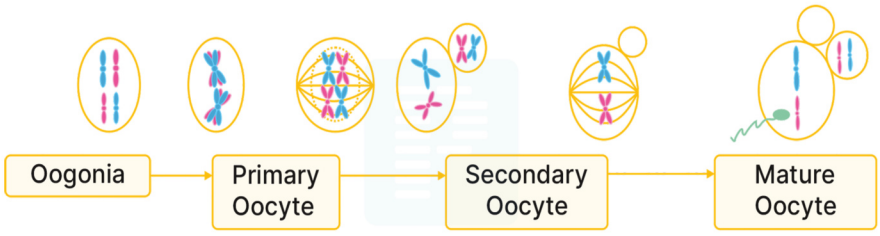
Q 1.1: Explain the Hypothalamo-Pituitary-Ovarian (HPO) axis.

Answer:



Q 1.2: Describe the process of oogenesis.

Answer:



Q 1.3: In which stage is the primary oocyte arrested, and what maintains this arrest? PYQ: NEET PG 2019

Answer:

- The primary oocyte is arrested in Meiosis 1, specifically the diplotene phase of prophase
- This arrest is due to an oocyte maturation inhibitor secreted by the granulosa cells of the follicles

Q 1.4: When is the first meiotic division of the oocyte completed, and what is its outcome?

Answer: Just before ovulation, resulting in a reduction division and the release of the first polar body

Q 1.5: At what stage is the secondary oocyte arrested, and when is the second polar body released?

Answer:

- Secondary oocyte - arrested in meiosis II (metaphase)
- 2nd polar body → released during fertilization

Q 1.6: When does oogenesis begin in females?

Answer: In the intrauterine life of the female fetus

Q 1.7: What is the origin of primordial germ cells, and how do they reach the ovary?

Answer:

- Primordial germ cells are diploid and originate from the primitive ectoderm
- 1st identified in the endoderm of the yolk sac by the end of the 3rd week of fertilization
- Reach developing ovaries by 6 weeks of gestation

Q 1.8: When do oogonia first appear, and when is their maximum number reached?

Answer:

- Oogonia - 1st appear at 9 weeks of gestation
- Max. number of oogonia - At 20 weeks of gestation (around 7 million)

Q 1.9: When do primary oocytes first appear and meiosis 1 begin?

Answer: By 11-12 weeks of gestation

Q 1.10: When does follicular formation begin in intrauterine life, and what happens to the primary oocytes?

Answer:

- In intrauterine life, follicular formation begins by 18-20 weeks of gestation
- The primary oocyte becomes surrounded by follicular cells, and a follicle will form
- Primary oocytes that are not encased by follicles undergo atresia

Q 1.11: How does the number of primary oocytes change from birth to puberty?

Answer:

- At birth, a girl is born with a million primary oocytes
- At puberty, only 4 lac primary oocytes remain

Q 1.12: Approximately how many ovulations occur during a woman's reproductive life?

Answer: ~ 400

Q 1.13: What is GnRH, where is it synthesized, and what are its key features?

Answer:

- GnRH - Neurohormone synthesized in the arcuate nucleus of the hypothalamus
  - It is a Decapeptide (10AA)
- Half-life: 2 to 4 min (~ 3 min)

Q 1.14: How does the pattern of GnRH secretion affect the pituitary?

Answer:

- Pulsatile secretion - stimulates the pituitary
- Continuous secretion - downregulate the pituitary

Q 1.15: How do long-acting synthetic GnRH analogues act, and what is their effect on ovarian hormone production?

Answer:

- Synthetic GnRH analogues: Long-acting, occupy GnRH receptors & cause receptor desensitization
  - Receptor desensitisation causes the receptor & GnRH complex to get internalised, metabolized & broken down
  - No cell surface GnRH receptors left
  - ↓ in gonadotropin level → suppress ovarian hormone production

Q 1.16: What is Kallmann syndrome, its genetic basis, and clinical features?

Answer:

- Congenital deficiency of GnRH-secreting neurons
- X-linked inheritance
- A mutation in the kal-1 gene encoding for the protein Anosmin
  - Anosmin - required for migration of GnRH-secreting neurons/ olfactory neurons from the olfactory placode to the hypothalamus → congenital deficiency of GnRH-secreting neurons
- Present with 1° amenorrhea & anosmia

Q 1.17: Which gonadotropins are secreted by the anterior pituitary, and what is their source?

Answer:

- Hormones - FSH & LH
- Source - Synthesized from gonadotrophs in the anterior pituitary

Q 1.18: What is the structural feature of gonadotropins?

Answer:

- Glycopeptide hormones have an α subunit (non-specific) and a ß subunit (specific)
- The non-specific α subunit is shared between FSH, LH, hCG, and TSH

Q 1.19: What are the half-lives of FSH and LH?

Answer:

- Half-life of FSH - 3 to 4 hours
- Half-life of LH - 20 min

Q 1.20: Which hormone is structurally similar to LH?

Answer: HCG

Q 1.21: Which steroid hormones are synthesized by the ovaries?

Answer: Estrogen, progesterone, as well testosterone

Q 1.22: What is the main androgen synthesized by the ovary?

Answer: Androstenedione

Q 1.23: Which is the most potent and predominant estrogen during reproductive age?

Answer: Estradiol (E2) > Estrone (E1) > Estriol (E3)

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Q 1.24: Which estrogen is synthesized in the maximum amount in reproductive life?
Answer: E2 (oestradiol)

Q 1.25: Which is the predominant estrogen in postmenopausal women, how is it produced, and what is its clinical significance?
Answer:

- The predominant form of estrogen in postmenopausal women is Estrone (E1), which comes from the peripheral aromatization of androgens
- Both androgens (secreted from adrenal glands & ovaries) get aromatized in peripheral fat cells
- Clinical correlation
  - o Obese women have more peripheral production of estrone
- More oestrogen →↑ risk of oestrogen-related conditions like endometrial hyperplasia & cancer

Q 1.26: Which forms of estrogen are specific to pregnancy?
Answer: E4 (Estetrol) > E3

Q 1.27: Compare the actions of estrogen and progesterone on the endometrium, pregnant uterus, cervical mucus, and fallopian tube.
Answer:

Action	Estrogen	Progesterone
Endometrium	• Proliferation	• Secretory changes
Pregnant uterus	• Growth (myometrium hypertrophy & hyperplasiaq)	• Decidualization • Also prepare endometrium for implantation
Cervical mucus	• Sodium & chloride content and ↓ protein content of cervical mucus • Cause thinning & ↑ elasticity (stretchable) of cervical mucus i.e., called as Spinnbarkiet • Ferning-cervical mucus spread on glass slide under microscope give Ferning pattern	• Thickness cervical mucus • In between fingers in breaks apart → Tack phenomenon
Fallopian tube	• ↑ motility & ↓ secretion	• ↓ motility & ↑ secretion

Q 1.28: What is the action of estrogen and progesterone on the breast, growth, and coagulation system?
Answer:

Action	Estrogen	Progesterone
Breast	• Ductular development	• Alveolar development only after Estrogen priming

Growth	• Responsible for growth spurt (seize at puberty) & mineralization of bones • Ultimately causes closure of epiphysis of long bones	-
Caogulation	• Responsible for hypercoagulability in pregnancy	-

Q 1.29: How does cervical mucus change during midcycle and after ovulation, and what is its reproductive significance?

Answer:

- Midcycle, where estrogen levels are & cervical mucus is thin & stretchable Wet/ fertile days of cycle
- After ovulation, cervical mucus thickens & prevents the ascent of sperm

Q 1.30: What is the effect of early puberty in girls?

Answer: Girls with early puberty tend to be shorter in height.

BIG QUESTION 2: Explain the menstrual cycle, highlighting its phases, hormonal regulation, and key endometrial changes.

Broad Answer:

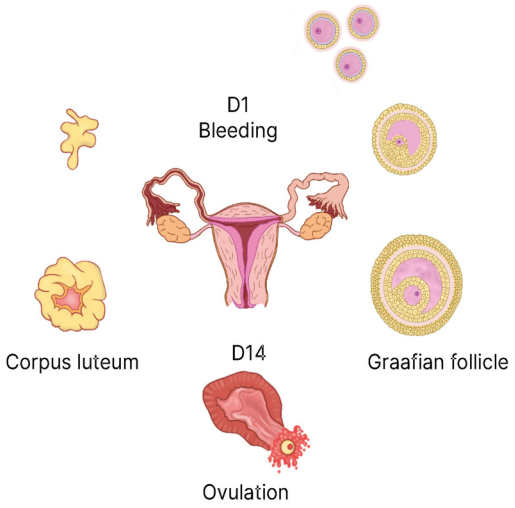
- The menstrual cycle (~28 days) is regulated by the HPO axis: FSH and LH stimulate follicle growth, leading to an estrogen-driven proliferative phase (follicular phase) and a progesterone-dominant secretory phase (luteal phase).
- Ovulation occurs mid-cycle by an LH surge, and in the absence of fertilization, corpus luteum regression with progesterone withdrawal causes menstruation.

DETAILED QUESTIONS

Q 2.1: What is the normal duration of the menstrual cycle, and when does ovulation occur?

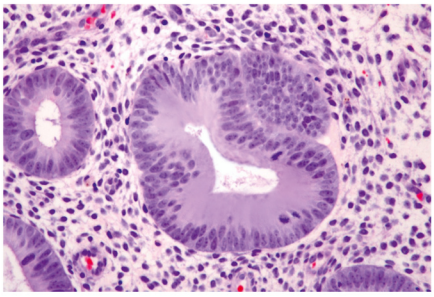
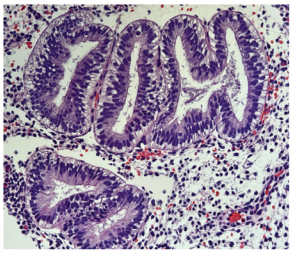
Answer:

- Duration - 28-day cycle, Day 1 - Bleeding starts
- Ovulation occurs by day 14



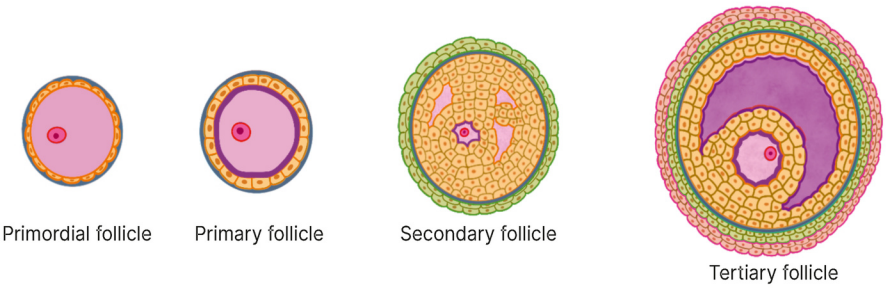
Q 2.2: Describe the two main phases of the menstrual cycle and their corresponding endometrial changes.

Answer:

1st Half of Cycle-Follicular Phase	2nd Half of Cycle-Luteal Phase
• Corresponds to proliferative phase of uterine cycle growth • Growing folliicles secrete estrogen → act on endometrium → proliferation of endometrium • In proliferative phase o Narrow tubular glands o Loose syncytial stroma o Pseudo stratification 	• After ovulation remaining follicle forms corpus luteum • Corresponds to secretory phase of uterine cycle • Corpus luteum secretes ↑↑ amount of progesterone • Corpus luteum also secretes estrogen, Inhibin A, Relaxing (by corpus luteum of pregnancy) • In secretory phase o Subnuclear vacuolation - 1st change o Cork-screw shaped glands o Stromal edema o Leucocytic infiltration 

Q 2.3: What are the main stages of follicular development in the ovary?

Answer:



Q 2.4: What causes menstrual bleeding in the absence of pregnancy?

Answer: Degeneration of Corpus luteum → progesterone withdrawal → Menstrual bleeding

Q 2.5: Which gonadotropins are required for folliculogenesis, and which hormone ensures final follicle maturation?

Answer:

- Both FSH & LH are required for complete folliculogenesis
- Final maturation of the follicle is achieved by LH

Q 2.6: What is the role of FSH and LH in estrogen synthesis during folliculogenesis?

Answer:

- FSH stimulates granulosa cells to secrete estrogen
- LH stimulates theca cells to secrete androgen (raw material for estrogen synthesis)

Q 2.7: Explain the Two-cell, Two-gonadotropin theory of estrogen synthesis

Answer:

Androgen $\xrightarrow[\text{Aromatase}]{\text{(Stimulated by FSH) in granulosa cells}}$ Estrogen

Q 2.8: Describe the role of gonadotropins in follicular growth.

Answer:

- Growth of antral & preovulatory follicles is dependent on gonadotropins
- Follicular growth is gonadotropin independent up to the formation of the secondary follicle (late preantral stage)

Q 2.9: How long does it take for a primordial follicle to develop into a preovulatory follicle?

Answer: 85 days

Q 2.10: What are the main functions of LH in the ovarian cycle?

Answer: Responsible for ovulation, resumption of Meiosis I & support the corpus luteum in the non-pregnant state

Q 2.11: What is the lifespan of the corpus luteum in the pregnant and non-pregnant state?

Answer:

- In non-pregnant state: 10-12 days
- In the pregnant state: 10 weeks

Q 2.12: Which hormone supports the corpus luteum during pregnancy?

Answer: hCG

Q 2.13: What causes luteolysis and menstrual bleeding in the absence of pregnancy?

Answer:

- Luteolysis occurs d/t to progesterone withdrawal
- Enzymatic autodigestion of endometrium occurs d/t to inflammatory mediators, prostaglandins

Q 2.14: What happens to different layers of the endometrium during different phases of menstruation?

Answer:

- The superior 2/3rd of the endometrium is the functionalis layer, which is shed off as menses
  - o Superficial layer - supplied by spiral arteries (end arteries)
- Basalis layer of endometrium (deeper 1/3rd) - provides for regeneration
  - o Supplied by basal arteries (not end arteries)

Q 2.15: Which hormone shows a peak just before ovulation?

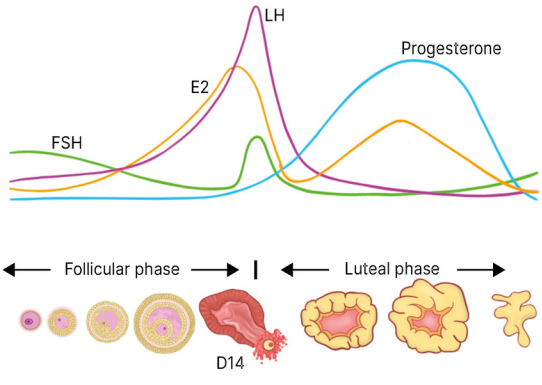
PYQ: FMGE 2019, 2020, 2021

Answer: LH

Q 2.16: Describe the hormonal changes around ovulation and their significance in the menstrual cycle

Answer:

- As dominant follicle grows, it synthesises estrogen → Estradiol (E2) peak
  - o E2 peak - Serum oestradiol level > 200 pg/ml sustained for at least 48-50 hrs



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- E2 peak → stimulate pituitary gland to release LH
- FSH acts on follicles first and recruits follicles into the menstrual cycle
- Corpus luteum secretes progesterone
- After ovulation, progesterone levels peak (7-8 days after ovulation)
- Some progesterone also comes from luteinized granulosa cells of the dominant follicle helps maintain the LH surge

Q 2.17: Which hormones are responsible for initiating and maintaining the LH surge?

Answer:

- Estardiol - responsible for initiating the LH surge
- Maintenance of surge required both estrogen & progesterone

Q 2.18: What is the timing and requirement of the LH surge for ovulation?

Answer:

- LH surge occurs approximately 36 hours before ovulation
- LH peak occurs approximately 10-12 hours before ovulation
- The peak LH levels of approximately 75 ng/ml must be sustained for at least 24 hours for ovulation to occur

Q 2.19: On which day of the menstrual cycle does peak corpus luteum activity/peak progesterone secretion occur, and what is the approximate level?

Answer:

- Peak secretory activity/peak Corpus Luteum activity/peak progesterone levels - Occurs around D21/D22 of the cycle
- Peak progesterone levels: ~ 15ng/ml

Q 2.20: How can the regularity of the menstrual cycle, timing of peak proliferative changes, and fixed luteal phase be used to predict ovulation?

Answer:

- Peak proliferative changes: D8/ D10 of cycle
- The duration of the luteal phase is fixed
- Regular cycles are most likely ovulatory
- Expected ovulation day = Cycle length - 14
- Irregular cycles are anovulatory

Q 2.21: What is considered a normal menstrual cycle, and how are unusually long or short cycles classified?

Answer:

- Normal cycle length or frequency of menses - 21-35 days (previously considered normal) or 24-38 days
- Cycle length prolonged (infrequent cycles): Oligomenorrhea
- Cycle length shortened (frequent cycles): Polymenorrhea

Q 2.22: What are the normal duration and volume of menstrual flow, and how are abnormal flows classified?

Answer:

- Normal duration of flow: 2-8 days
  - Prolonged duration of flow (> 8 days) &/or heavy bleeding (> 80 ml) - Menorrhagia
- Volume of monthly blood loss: ~ 35-50 ml

- Excessive bleeding interfering with quality of life - Heavy menstrual bleeding
- Scanty flow (light flow)- Hypomenorrhea

Q 2.23: What is metrorrhagia and intermenstrual bleeding?

Answer:

- Cycle-to-cycle variation of >10 days - Irregular cycles (Metrorrhagia)
- Acyclical bleeding episodes superimposed on normal cycles - Intermenstrual bleeding

Q 2.24: What is Mittelschmerz?

Answer:

- Midcycle pain, during ovulation
- During ovulation, the follicle ruptures and the follicular fluid drops down in the pelvis irritating the peritoneum & causing midcycle pain
- Last for 1 day (max 2 days)

Q 2.25: What is dysmenorrhea, and what is its underlying mechanism?

Answer:

- Dysmenorrhea - Painful periods
- During menstruation, prostaglandins are released (PGF2α) predominates
  - This causes uterine contraction, leading to an ischemic type of pain

Q 2.26: Differentiate between primary (spasmodic) and secondary (congestive) dysmenorrhea.

Answer:

	Primary (Spasmodic) Dysmenorrhea	Secondary (Congestive) Dysmenorrhea
Age	Younger women within a few year of menarche	Older women can occur in anovulatory cyclescycles
Menstrual cramps	Starts on the same day of menses Lasts for 48-72 hours Improves as flow increases	Starts 1-2 weeks prior to menses & persists throughout
Pelvic exam	Normal	Some evidence of pathology
Treatment	Counter pressure, hot fomentation, NSAIDs, OCPs	T/t of cause, OCPs

BIG QUESTION 3: Explain the hormonal regulation and physiological changes during female puberty, and the concept of precocious puberty.

Broad Answer: Puberty (9-13 yrs) is triggered by HPO axis reactivation, causing secondary sexual characteristics, growth spurt, and menarche; precocious puberty is early activation (<8 yrs). Estrogen drives breast, endometrial, bone, and vaginal changes

DETAILED QUESTIONS

Q 3.1: What marks the onset of female puberty and its average age?

Answer:

- Average age: 9 - 13 years

- Marked by the development of Secondary sexual characteristics & achievement of reproductive capacity

Q 3.2: How is the HPO axis involved in the onset of puberty?

Answer:

- The HPO axis gets reactivated, which involves Kisspeptin (encoded by the Kiss 1 gene) and neurokinin B, both of which are gatekeepers of pubertal onset
- The HPO axis is also active in intrauterine life, but remains dormant in childhood
- Leptin - Permissive role

Q 3.3: Which hormones change first at puberty, and what is characteristic of initial menstrual cycles?

Answer:

- 1st hormone to increase - FSH
- Initially, only nighttime secretion of LH
- Initial cycles are anovulatory

Q 3.4: What is the most common cause of abnormal uterine bleeding in pubertal girls, and how does it typically present?

Answer:

- M/c cause of AUB pattern in pubertal girls/ puberty menorrhagia - Anovulation
- Typical anovulatory pattern of bleeding - H/o delayed cycle, heavier than usual bleeding lasting longer

Q 3.5: What is the sequence of pubertal development in girls?

Answer:

Growth spurt (1st sign of puberty)
↓
Thelarche (1st visible sign of puberty) - Breast budding
↓
Pubarche (Androgen dependent change)
↓
Peak height velocity
↓
Menarche

Q 3.6: What hormones drive growth during puberty?

Answer:

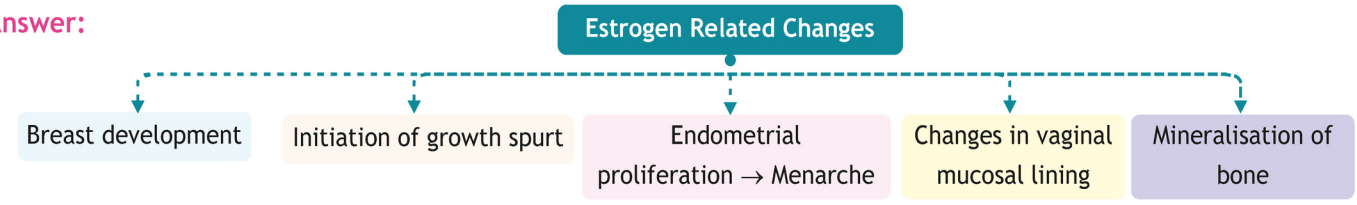
- Growth primarily depends upon growth hormone, insulin-like growth factors
- Also, estrogen has some role to play

Q 3.7: What is gonadarche?

Answer: Activation of the gonads to secrete estrogen

Q 3.8: What are the key estrogen-related changes?

Answer:



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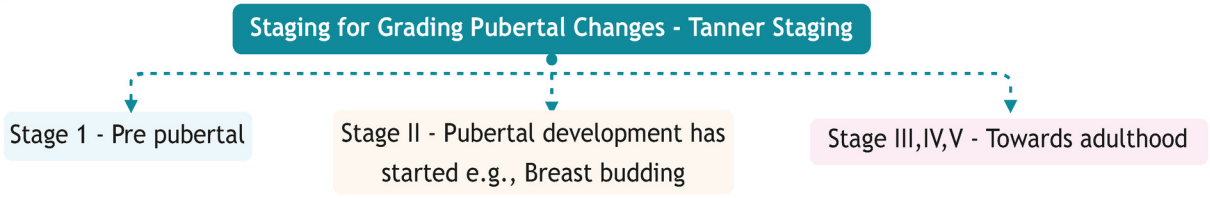
Q 3.9: What is adrenarche, and what role do adrenal androgens play in puberty?

Answer:

- Adrenarche occurs at around 6 years of age
  - o Increase in DHEA-S levels
- Androgens typically come from the adrenal gland and are responsible for initiating pubic hair and axillary hair development

Q 3.10: How are pubertal changes in girls graded clinically?

Answer:



Q 3.11: What defines precocious puberty in girls, its common cause, and management?

Answer:

- Development of female secondary sexual characters before the age of 8 years & onset of menarche before 10 years
- M/c cause - Constitutional/ Idiopathic
  - o HPO axis gets reactivated prematurely
- Management - DOC: GnRH analogues (suppress HPO axis)

Q 3.12: Differentiate between central (true) and peripheral (pseudo) precocious puberty in girls.

Answer:

Central/True	Peripheral/Pseudo
Gn depends (↑ Gn levels)	Gn depends (↓ Gn levels)
Always isosexual	Isosexual/heterosexual
Ovulation occur eventually; Menses always occur	No ovulation, Menses may not occur
E.g., • Idiopathic • CNS tumors - M/c: Hamartomas • CNS infections/ trauma	E.g., • Estrogen secreting ovarian tumours • Androgen secreting ovarian tumours • Non-classical CAH • Mc Cune albright syndrome (Isosexual)

BIG QUESTION 4: Explain the etiology, diagnosis, clinical features, and management of menopause, including the role of hormone replacement therapy.

Broad Answer: Menopause is due to ovarian follicle depletion, causing estrogen deficiency, irregular cycles, and hot flashes. Management involves hormone replacement therapy for symptom relief and bone protection, considering associated risks.

DETAILED QUESTIONS

Q 4.1: What is the primary cause of menopause?

Answer: Depletion of Ovarian follicles → Estrogen deficiency → No endometrial proliferation.

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Q 4.2: What is the average age of women having menopause worldwide and in India?

Answer:

- Average age worldwide - 51 years
- Indian women - 47 years

Q 4.3: How is menopause diagnosed, and at what age is late or premature menopause attained?

Answer:

- Late menopause is defined as menopause that occurs after 55 years of age.
- Premature menopause or premature ovarian insufficiency is defined as menopause occurring before the age of 40
- Diagnosis - Retrospective diagnosis after 1 year of amenorrhea

Q 4.4: How is menopause diagnosed in women outside the typical age range?

Answer:

- For women not in the expected age range who have amenorrhea, a diagnosis of menopause can be made if serum FSH levels are > 40 IU/L on two occasions at least one month apart
- Post menopausal serum estradiol levels are defined as levels < 20pg/ml

Q 4.5: What hormonal changes occur after complete ovarian follicle depletion, and what is the role of Inhibin B?

Answer:

- Once follicles are completely depleted estrogen levels Inhibin B FSH levels
- Role of Inhibin B - To inhibit FSH

Q 4.6: What is the typical duration of the perimenopausal period, and what is its most consistent clinical feature?

Answer:

- Perimenopausal period - 2 to 8 years before final menstrual period (~ 5 years)
- Most consistent feature of menopausal transition (climacteric) - irregular cycles

Q 4.7: What is the most bothersome symptom of menopause?

Answer:

- Hot flashes (vasomotor symptoms)
  - Occurs because of E2 withdrawal
  - Worsen at night d/t an increase in LH pulses
  - M/c reason for starting HRT

Q 4.8: How is hormone replacement therapy (HRT) tailored based on the presence or absence of the uterus?

Answer:

- If uterus present - Estrogen + Progesterone (for endometrial protection)
- If uterus Absent - Estrogen
  - Except with h/o supracervical hysterectomy, endometrial cancer, endometriosis, endometrial tumour of the ovary - Estrogen + progesterone given

Q 4.9: What are the alternatives for managing menopause if estrogen therapy is contraindicated?

Answer:

- SSRIs/ SNRIs
- Paroxetine - FDA approved

Q 4.10: What is the preferred treatment if the only menopausal complaint is vaginal dryness?
Answer: Local estrogen cream

Q 4.11: Which SERM is used for dyspareunia due to vaginal dryness?
Answer: Ospemifene O

Q 4.12: Are Tamoxifen and Raloxifene used to treat hot flashes in menopause?
Answer: No, they are not used for hot flashes

Q 4.13: What combination is being considered for future HRT?
Answer: Conjugated equine estrogen + Bazedoxifene

Q 4.14: What is the drug of choice for osteoporosis in postmenopausal women?
Answer: Bisphosphonates

Q 4.15: Is hormone replacement therapy cardioprotective?
Answer: No, HRT is not cardioprotective

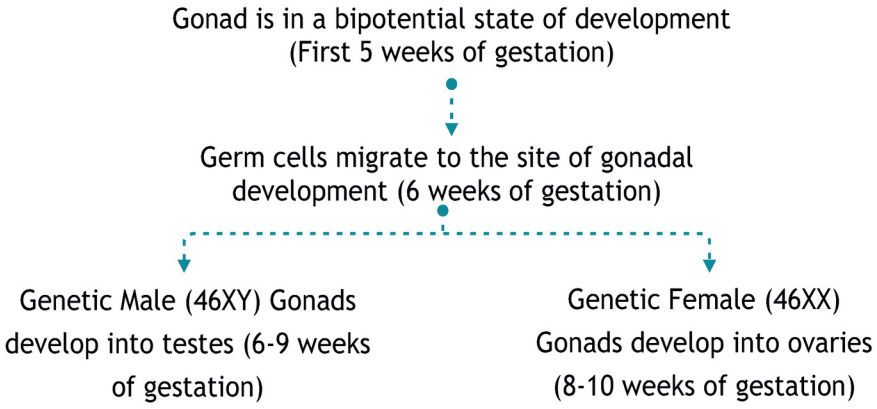
Q 4.16: What are the main advantages and disadvantages of hormone replacement therapy (HRT) in postmenopausal women?
Answer:

Advantages	Disadvantages
Relief from hot flashes	↑ risk of CAD in older women
Relief from genitourinary atrophy symptoms	Risk of breast cancer
Prevention of osteoporosis	Risk of VTE
↓ risk of colon cancer	Risk of endometrial cancer
	Risk of gall stones
	Risk of ovarian cancer

3. RELEVANT CLINICAL EMBRYOLOGY AND ASSOCIATED DISORDERS.

BIG QUESTION 1: How do gonads develop into either testes or ovaries during human development?

Broad Answer: The development of gonads occurs within the gonadal ridge, located medial to the mesonephros.



DETAILED QUESTIONS

Q1.1: Which genes are involved during gonadal development?

Answer:

Genes upregulated in the development of gonads:

- **Genetic Male (46XY):** SOX-9, FGF-9 (SRY gene located on short arm of Y chromosome)
- **Genetic Female (46XX):** WNT-4 & R-spondin-1

Q1.2: Which hormones or factors are produced by Sertoli and Leydig cells?

Answer:

Sertoli cells	Leydig cells
AMH (Anti-Mullerian Hormone), aka Mullerian inhibiting substance (MIS)	Testosterone

Q1.3: What is the source of dihydrotestosterone (DHT)?

Answer: Testosterone

Testosterone
- Starts: 8 weeks
- Peaks: 15-18 weeks
- Initial stimulus: hCG

Testosterone ----> 5-DHT

5-DHT (dihydrotestosterone)
- Function: External genitalia masculinization
- Begins: 10th week
- Completed by: 12-14 week

Q1.4: How early can a baby's sex be identified?

Answer: 10 weeks (prohibited in India by PCPND Act)

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Q1.5: What happens to the Müllerian and Wolffian ducts in males and females?

Answer:

Ducts	Genetic Male (46XY)	Genetic Female (46XX)
Müllerian Duct (Paramesonephric duct)	Regresses by 8 weeks of gestation	Müllerian Duct develops (no AMH)
Wolffian Duct (Mesonephric duct)	Forms male genitalia by 9-12 weeks of gestation.	Regresses and external genitalia remains female (No Androgens)

Q1.6: What are the developmental implications of failed germ cell migration?

Answer: As a result, gonads do not develop, and the body forms female genitalia by default.

Ovarian development requires both X chromosomes.

BIG QUESTION 2: The female internal genital system is derived from?

Broad Answer: Müllerian duct (also called paramesonephric duct).

It gives rise to:

- Fallopian tubes
- Uterus
- Cervix
- Upper part of the vagina

DETAILED QUESTIONS

Q2.1: What is the anatomical relationship between the Müllerian and Wolffian ducts in females?

Answer: The paramesonephric duct initially lies lateral to the mesonephric duct, then crosses the midline and fuses centrally before entering the urogenital sinus. The Müllerian ducts completely fuse by 10 weeks of gestation.

Q2.2: Which anatomical structures arise from the various segments of the Müllerian ducts during female reproductive tract development?

Answer:

Part of Mullerian Duct	Derivative
Unfused part	Fallopian tube
Fused part	• Uterus • Cervix • Upper 1/3rd of vagina

Q2.3: During which weeks of gestation do the Müllerian ducts completely fuse, the uterine cavity form, the endometrium differentiate, and vaginal canalization complete?

Answer: It is as follows:

Key developmental milestones	Weeks of gestation
Complete fusion of Müllerian duct	10 weeks of gestation

Formation of the uterine cavity	18-20 weeks of gestation
Endometrium differentiates	20 weeks of gestation
Canalization of vagina completed	20 weeks of gestation

Q2.4: From which embryonic structures does the vagina develop?

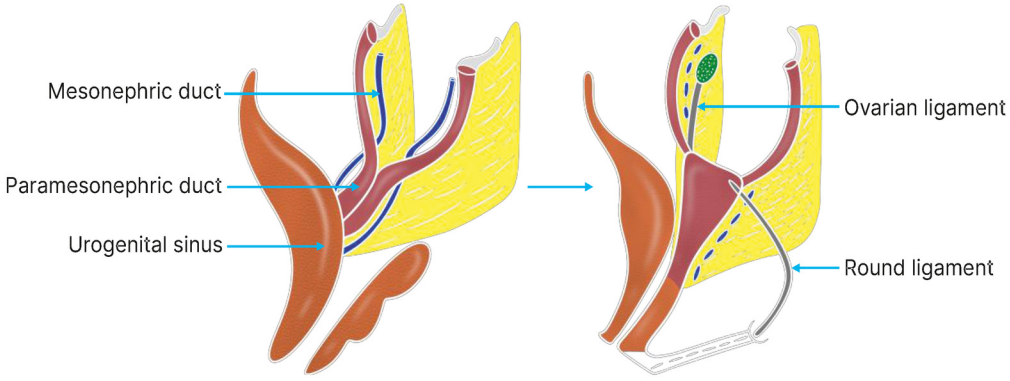
Answer: **Development of Vagina:**

- Upper 1/3rd: Mesodermal (lower fused part of Mullerian duct)
- Lower 2/3rd: Endodermal (urogenital sinus)
- Fibromuscular wall: Mesodermal
- Epithelium of entire length: Endodermal

Q2.5: What do the mesonephric duct and gubernaculum leave behind after development?

Answer: The remnants are:

Gubernaculum	Mesonephric duct
• Ovarian ligament • Round ligament	Located in the sheets of broad ligament **Cranial remnant:** • Paraoophoron • Epoophoron **Caudal remnant:** • Gartner's duct



BIG QUESTION 3: What is the clinical significance of Gartner's duct?

Broad Answer: Gartner's duct, a vestigial remnant of the mesonephric (Wolffian) duct in females, is clinically significant due to its potential to form Gartner's duct cysts.

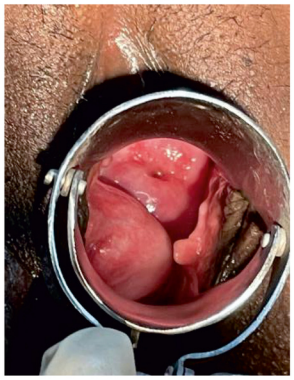


Gartner's cyst

DETAILED QUESTIONS

Q3.1: What is the site of a Gartner's cyst?

Answer: Gartner's cyst arises from antero-lateral aspect of vagina.



Per speculum Examination: Swelling arising from Antero-lateral aspect of vagina

Q3.2: What other conditions can be mistaken for a Gartner's cyst?

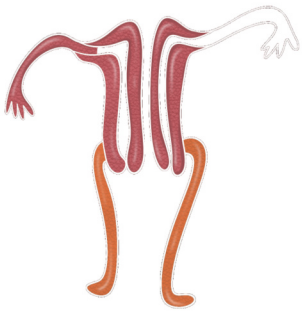
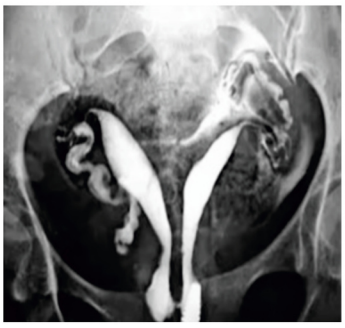
Answer: Cystocele is the differential diagnosis for Gartner's cyst.

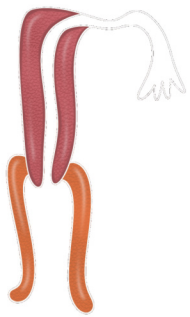
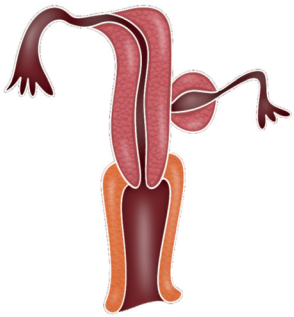
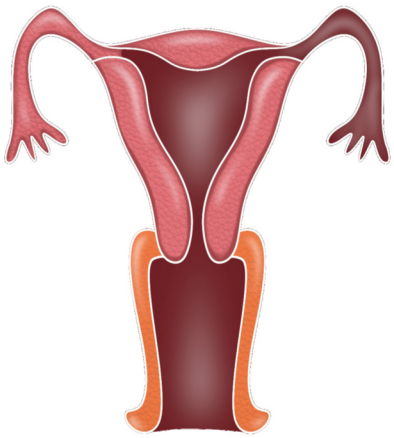
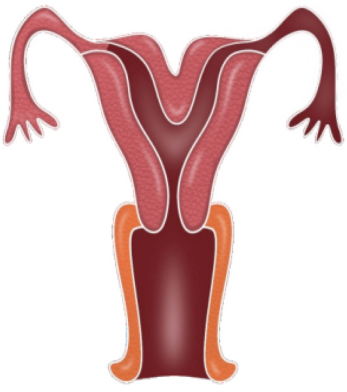
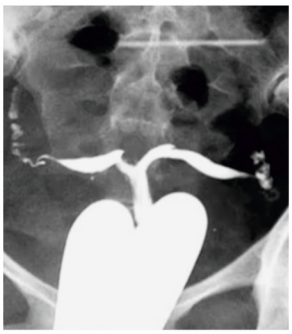
Clinical features	Gartner's Cyst	Cystocele
Tense or non-tense	Tense cystic swelling	Non-tense bulge
Compressible or non-compressible	Non-compressible	Reducible
Vaginal rugosities	Lost	Present
Cough impulse	Absent	Present

BIG QUESTION 4: What are the different types of Müllerian duct anomalies?

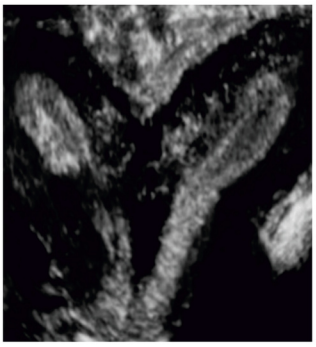
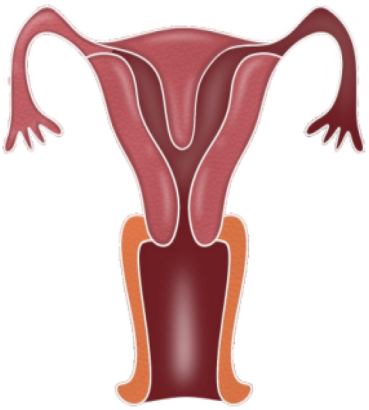
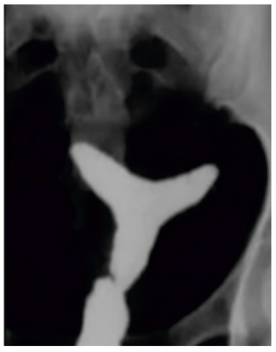
Broad Answer: **Types of Müllerian duct anomalies are:**

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Mullerian Duct Anomaly	Illustration	Radiographic image
Didelphys Uterus • Complete failure of fusion of Mullerian ducts o 2 Uterus o 2 Cervix • Can be associated with vaginal septum o Longitudinal septum **(m/c)**		**HSG** 

Unicornuate Uterus • Mullerian duct development only on one side		**HSG** 
Unicornuate Uterus with Rudimentary Horn • If functional: o U/L dysmenorrhea o Rudimentary horn pregnancy **(cornual pregnancy)**		-
Septate Uterus • Failure of the dissolution of the septum • 2 separate uterine cavities • Single fused cervix • Intact fundus • **Can cause: 1st trimester abortions and infertility** **HSG:** Acute angle; Distance between 2 horns < 4 cms **USG:** Acute angle; Length of septum > 1 cm		 **HSG** 
Bicornuate Uterus • Incomplete fusion of Mullerian duct o Fused in lower part • 2 separate uterine cavities • Single fused cervix **HSG:** Obtuse angle; Distance between 2 horns > 4 cms		 **HSG**

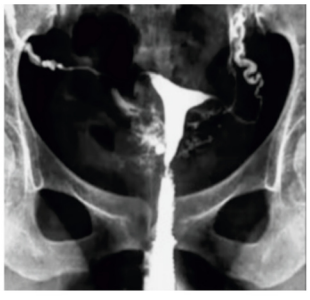
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USG: Dip in the fundus		 USG
Arcuate Uterus • Mildest form • Normal cavity **USG:** Obtuse angle; Length of septum ≤ 1 cm		 HSG  USG

DETAILED QUESTIONS

Q4.1: What are the differences in hysterosalpingography images of normal vs DES-exposed uterus?

Answer:

Normal Uterus	DES-exposed Uterus
	 T-shaped uterus with irregular endometrium

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Q4.2: What is transverse vaginal septum and imperforate hymen?

Answer: A transverse vaginal septum results from either failure of vaginal canalization or failure of fusion between the fused Müllerian ducts and the urogenital sinus. An imperforate hymen arises from the persistence of the hymenal membrane without proper perforation during development.

Q4.3: Answer the following:

- Most common anomaly of Mullerian duct.
- Most common clinical presentation of Mullerian duct anomalies.
- Maximum incidence of urinary tract abnormalities is seen in which Mullerian duct anomaly?

Answer: The key points related to Mullerian duct anomalies are:

- Most common anomaly: Septate Uterus > Bicornuate Uterus
- Most common clinical presentation: 2nd trimester abortion
- Maximum incidence of urinary tract abnormalities (m/c ipsilateral renal agenesis) is seen in: Unicornuate Uterus
- Best reproductive outcome: Arcuate uterus > Didelphys uterus
- Malpresentations (m/c is transverse lie) are more likely with distorted uterine cavity.

Q4.4: Enlist the DES (diethylstilbestrol)-related abnormalities.

Answer: They are:

- Vaginal adenosis (m/c overall)
- Cervical hood & collars
- Hypoplastic uterus (m/c finding in uterus)
- T-shaped uterus (most specific finding in uterus)
- Clear cell adenocarcinoma of vagina/cervix

Q4.5: What is the investigation of choice and gold standard investigation for Mullerian anomalies?

Answer:

- IOC: 3D USG.
- Gold standard investigation: Laparo-hysteroscopy
- MRI: To rule out associated renal abnormalities

Q4.6: what is the most common indication for surgical correction in Mullerian anomalies?

Answer: M/c indication for surgical correction: Recurrent pregnancy loss

Q4.7: What are the treatment options for Mullerian anomalies?

Answer: Management of Mullerian anomalies:

- Hysteroscopic septum resection (TOC for septate uterus with infertility or recurrent abortion).
- Uterus unification surgeries (metroplasty): Bicornuate/Didelphys uterus
  - Jones metroplasty
  - Tompkins metroplasty
  - Strassman's metroplasty

BIG QUESTION 5: What is Mullerian Agenesis?

Broad Answer: It is referred to the absence or underdevelopment of the Müllerian ducts (absence of uterus, fallopian tubes, and vagina).

DETAILED QUESTIONS

Q5.1: What is the Karyotype in Mullerian Agenesis?

Answer: The karyotype in Müllerian agenesis is 46,XX, indicating that ovaries are present as the gonads.

Q5.2: How are secondary sexual characteristics affected in patients with Müllerian agenesis?

Answer: In Mullerian agenesis, we can observe:

- Primary amenorrhea (uterus absent)
- Uterus, tubes & vagina absent → Blind vaginal pouch
- Normal Breast & Pubic hair development

Q5.3: What is the management in Mullerian agenesis?

Answer: Mullerian agenesis management:

- Vaginoplasty may be needed: McIndoe's vaginoplasty
  - o Frank vaginal dilators
- IVF surrogacy (pregnancy possible)

Q5.4: Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome is associated with which anomalies?

Answer: Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome is associated with:

- Mullerian agenesis
- Renal agenesis > Horseshoe kidney
- Hemivertebrae/scoliosis

BIG QUESTION 6: What are the disorders of sexual development?

Broad Answer: Following are the disorders of sexual development:

- Intersexuality
  - o Pseudo-hermaphroditism
    - → Female pseudo-hermaphroditism
    - → Male pseudo-hermaphroditism
  - o True hermaphroditism
- Gonadal dysgenesis
- 46XY Females

DETAILED QUESTIONS

Q6.1: What is Pseudo-hermaphroditism?

Answer: It is a type of disorder of sexual development (intersexuality) in which the gonads of one sex are present, but the phenotype corresponds to the opposite sex.

Q6.2: What are the types of Pseudo-hermaphroditism?

Answer: Types of Pseudo-hermaphroditism:

Features	Female Pseudo-hermaphroditism	Male Pseudo-hermaphroditism
Gonads	Ovaries	Testes
External genitalia	Male	Female

Most common cause	Congenital adrenal hyperplasia	Androgen insensitivity syndrome (aka Testicular feminization syndrome)

Q6.3: What is true hermaphroditism?

Answer: True hermaphroditism is a condition characterized by the presence of bilateral ovotestes, typically with a 46XX karyotype and ambiguous genitalia at birth (mostly).

Q6.4: What are the effects of androgen exposure on a 46XX fetus?

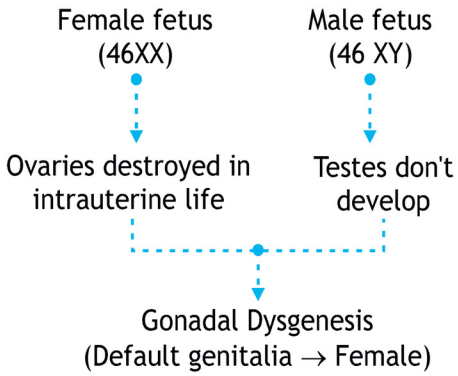
Answer: Female fetus (46XX) → Exposed to androgens → Ambiguous genitalia at birth → Development of urogenital sinus is not if affected.

Q6.5: What are the effects of deficient testosterone action on a 46XY fetus?

Answer: Male fetus (46XY) → Gonads testes → Deficient testosterone action → Complete deficiency → 46XY female.

BIG QUESTION 7: What are the consequences if ovaries are destroyed in utero in a 46XX fetus or if testes fail to develop in a 46XY fetus?

Broad Answer: Gonadal dysgenesis



DETAILED QUESTIONS

Q7.1: What are the most common causes of ambiguous genitalia in male and female fetus?

Answer: Most common cause of ambiguous genitalia in:

- **46 XX karyotype:** Congenital adrenal hyperplasia
  - M/c enzyme deficiency: 21 alpha hydroxylase deficiency
- **46 XY karyotype:** Partial androgen insensitivity syndrome

Q7.2: What is the most common type of gonadal dysgenesis and its karyotype?

Answer: Turner Syndrome.

- **Karyotype:** M/c: 45 XO, Can be mosaic:
  - 45 X / 46 XX
  - 45 XO / 46 XY **(Mixed Gonadal Dysgenesis)**

Q7.3: Explain epidemiology of Turner syndrome.

Answer: **Turner syndrome**

- M/c karyotype: 45 XO
- Incidence: 1 in 2000 live-born females
- 98% abort in utero

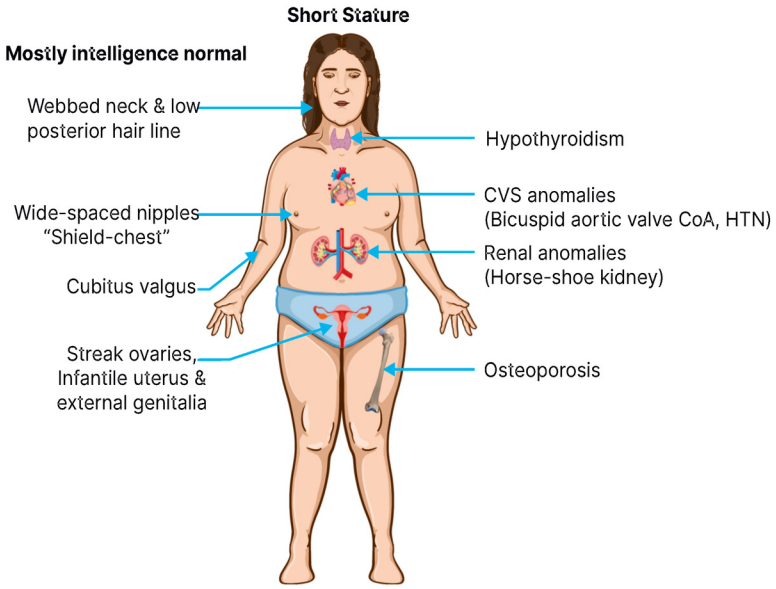
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- Increasing maternal age does not increase risk
- Missing X is paternally derived

Q7.4: What are the clinical features of Turner syndrome?

Answer: **Clinical features of Turner Syndrome:**

- Short stature (haploinsufficiency of SHOX gene → chromosome Xp22)
- Estrogen deficient (increased FSH and LH)
- Females with Turner mosaic can menstruate (depending on the ovarian activity).



Q7.5: What is the diagnosis and management of Turner Syndrome?

Answer: The diagnosis and management of Turner Syndrome:

- **Diagnosis:** Clinical profile and Karyotype (confirmation)
- **Monitoring:**
  - Evaluation for cardiac, renal, and thyroid status should be done.
  - Regular screening for sensorineural hearing loss & DM (increased risk to type 1 DM)
- **Management:**
  - Require lifelong HRT → Estrogen followed by (Estrogen + Progesterone)
  - Pregnancy contraindicated (high risk cardiac status)

Q7.6: What is the karyotype of Pure Gonadal Dysgenesis?

Answer: Karyotype of Pure Gonadal Dysgenesis:

- 46 XX
- 46 XY (Swyer syndrome)

Q7.7: What are the clinical features of gonadal dysgenesis?

Answer: Individuals with gonadal dysgenesis are typically raised as females and have a uterus. They commonly present with delayed puberty and primary amenorrhea due to nonfunctional (dysgenetic) gonads.

BIG QUESTION 8: Name the disorders of 46 XY females.

Broad Answer: Individuals with a 46XY karyotype may be born and raised as females, often presenting with primary amenorrhea and occasionally with an inguinal or labial mass due to undescended gonads. The associated disorders include:

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- SWYER'S (point mutation in SRY gene)
- COMPLETE AIS (complete deficiency of androgen receptors)
- Androgen synthesis deficiency (17α-hydroxylase enzyme)
- 5α-reductase deficiency

DETAILED QUESTIONS

Q8.1: What types of gonads are found in individuals with 46XY disorders of sex development presenting as phenotypic females?

Answer: Types of gonads and their associated disorders are:

- **Testes:**
  - Complete AIS (complete deficiency of androgen receptors)
  - Androgen synthesis deficiency (17α-hydroxylase enzyme)
  - 5α-reductase deficiency
- **Dysgenetic testes:**
  - SWYER'S (point mutation in SRY gene)

Q8.2: What types of genitalia are found in individuals with 46XY disorders of sex development presenting as phenotypic females

Answer: The genitalia and their respective disorders are:

Feature	SWYER'S (point mutation in SRY gene)	COMPLETE AIS (complete deficiency of androgen receptors)	Androgen synthesis deficiency (17α-hydroxylase enzyme)	5α-reductase deficiency
Internal Genitalia	Uterus present	Uterus absent	Uterus absent	Uterus absent
External Genitalia	Female	Female	Female or ambiguous	Female or ambiguous

Q8.3: How do breast and pubic hair development present in individuals with 46XY disorders of sex development?

Answer: Disorders of 46 XY sex development:

Features	SWYER'S (point mutation in SRY gene)	COMPLETE AIS (complete deficiency of androgen receptors)	Androgen synthesis deficiency (17α-hydroxylase enzyme)	5α-reductase deficiency
Breast development	Absent	Present (testosterone is aromatized to estrogen)	Absent	Absent, virilization at puberty
Pubic hair	Present	Absent	Absent if deficiency is complete	Present

4. ANOVULATION HORMONAL DISORDERS AND AMENORRHOEA

BIG QUESTION 1: What are the causes, diagnostic features, and management strategies for anovulation and PCOS?

Broad Answer: Anovulation is the failure to ovulate, and is a central cause of menstrual irregularities and infertility in reproductive-age women. PCOS is the most common cause of anovulation, but other factors include obesity, thyroid dysfunction, hyperprolactinemia, and functional hypothalamic issues. Diagnosis involves clinical signs and supportive hormonal evaluation. Management depends on fertility desires, presence of hirsutism, and associated metabolic risk.

DETAILED QUESTIONS

Q1.1: What are the common causes of anovulation?

Answer:

- PCOS
- Obesity
- Thyroid disorders (especially hypothyroidism)
- Hyperprolactinemia
- Functional hypothalamic dysfunction:
  - Stress
  - Chronic illness
  - Excessive exercise
  - Eating disorders

Q1.2: What clinical features suggest PCOS in a young woman with irregular menses?

Answer:

- Infrequent menses since menarche
- Irregular cycles often delayed by 2-3 months
- Bleeding episodes last 10-15 days
- Not sexually active
- Mild hair growth over chin and upper lip
- Dark velvety pigmentation at the nape of the neck (acanthosis nigricans)
- These suggest:
  - Anovulatory bleeding
  - Hirsutism
  - Insulin resistance

Q1.3:A 23-year-old girl presents with c/o infrequent menses since menarche. Her cycles are irregular, often delayed by 2-3 months, and bleeding lasts for 10-15 days. She is not sexually active. She has mild hair growth over her chin and upper lip. A dark velvety pigmentation is seen at the nape of her neck. What is the likely diagnosis?

A. PCOS

B. Cushing syndrome

C. Androgen-secreting tumor
D. Congenital adrenal hyperplasia

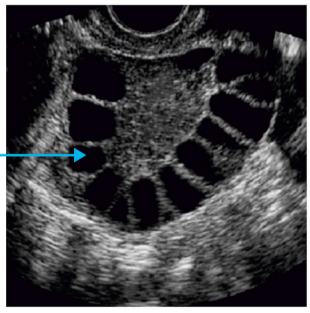
Answer: A. PCOS
Explanation:

- Anovulatory pattern of bleeding present
- Hair growth signifies hirsutism
- Pigmentation at the nape of the neck: Acanthosis nigricans
  - o A feature of underlying insulin resistance
- Androgen-secreting tumors are more likely in older women
- Congenital adrenal hyperplasia is more likely to present with precocious puberty

Q1.4: How is PCOS diagnosed?

Answer:

- Based on **Rotterdam criteria** - 2 out of 3 required:
  - o Menstrual abnormalities: Amenorrhea, oligomenorrhea, irregular cycles
  - o Clinical or biochemical hyperandrogenism:
    - → Clinical: Hirsutism
    - → Biochemical: Elevated serum testosterone
  - o USG features of polycystic ovaries:
    - → ≥12 follicles (or ≥20 follicles in newer criteria) in either ovary
    - → Ovarian volume ≥10 ml
    - → "String of pearls" (necklace appearance) of follicles is classic
    - → Stromal hyperplasia seen on USG
    - → Note: "String of pearls" appearance is **not** part of rotterdam's diagnostic criteria



Q1.5: What conditions should be ruled out before confirming PCOS?

Answer: Other causes of anovulation (e.g. thyroid disorders, hyperprolactinemia)

Q1.6: What are important metabolic and hormonal features associated with PCOS?

Answer:

- Underlying insulin resistance and hyperinsulinemia & ↑ ovarian androgen production
- Increased risk of:
  - o Metabolic syndrome
  - o Hypertension
  - o CAD
  - o Altered lipid profile
  - o Type 2 DM
  - o Endometrial hyperplasia (due to chronic anovulation and unopposed estrogen)
- Hormonal profile:
  - o ↑ LH, ↓ FSH (LH:FSH > 2:1 on day 2/3)
  - o E2:E1 ratio reversed (↑ Estrone > Estradiol) (E1>E2)
  - o Total estradiol levels normal
  - o Free estradiol ↑

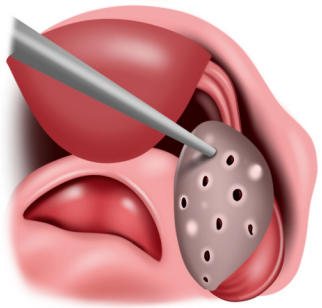
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- Total estrogen (E1 + E2) ↑
- SHBG ↓
- Serum AMH ↑ (>5ng/ml)

Q1.7: How is PCOS managed?

Answer:

- **Lifestyle modification and weight loss:**
  - 5% weight reduction may resume ovulation
- **Not desiring conception:**
  - DOC: OCP
    - → Regulates cycle
    - → Provides contraception
    - → Helps hirsutism
- **Ovulation induction:**
  - DOC: Letrozole > Clomiphene citrate
- **Insulin sensitizers:**
  - Metformin
- **Nutritional supplements:**
  - Inositol (provides metabolic benefit)
- **Laparoscopic ovarian drilling:**
  - Not first-line
  - Reserved for refractory cases



Laparoscopic ovarian drilling

BIG QUESTION 2: What are the features, grading, causes, and management strategies for hirsutism?

Broad Answer: Hirsutism is the presence of excessive terminal (coarse and dark) hair growth in a male-pattern distribution in females. It is a clinical manifestation of androgen excess and may be associated with virilization in more severe forms. Grading is done using Ferriman-Gallwey scoring. The cause may be PCOS, adrenal/ovarian tumors, or idiopathic. Management is directed at the underlying cause and includes hormonal therapy and anti-androgens.

DETAILED QUESTIONS

Q2.1: What is hirsutism?

Answer: Excessive growth of terminal (coarse and dark) hair in male pattern distribution in females.

Q2.2: How is hirsutism graded?

Answer:

- Ferriman-Gallwey Scoring system:
  - 9 sites are checked for abnormal hair growth
  - Score ≥8: Hirsutism present
  - Score >15: Severe hirsutism

Q2.3: What is virilization?

Answer:

- Features of severe androgen excess:
  - Deepening of voice

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- Temporal balding
- Breast atrophy
- Clitoromegaly (size ≥10 mm)

Q2.4: What is the origin and order of androgen concentrations in females?
Answer:

- Peripheral conversion occurs especially in adipose tissue.
- Obese females show more androgen excess features due to enhanced peripheral conversion.

Androgen	Source	Relative Concentration
DHEA-S	Adrenal glands (Exclusive)	Highest
DHEA	Adrenal glands	Highly abundant
Androstenedione	Adrenal + Ovarian	Moderate
Testosterone	Adrenal (25%) + Ovaries (25%) + Peripheral conversion (50%)	Lower in females compared to males

Q2.5: How do you differentiate causes of hirsutism based on severity and testosterone levels?
Answer:

Feature	S.testosterone levels	Diagnosis
Acute onset, severe hirsutism or virilization	Serum testosterone >150 ng/dL	R/o ovarian or adrenal tumors
Mild, chronic, slowly progressive hirsutism	Serum testosterone <150 ng/dL	Most likely PCOS

Q2.6: What are other differential diagnoses for androgen excess in females?
Answer:

- Hypothyroidism
- Hyperprolactinemia
- Non-classical Congenital Adrenal Hyperplasia (in pubertal girls with progressive hirsutism)

Q2.7: What is the diagnostic test for CAH?
Answer: Serum 17-OH Progesterone levels

Q2.8: What is the most common cause of heterosexual pubertal development at expected age of puberty?
Answer: PCOS

Q2.9: What is the most common cause of heterosexual precocious puberty?
Answer: Non-classical CAH

Q2.10: What is HAIR-AN syndrome?
Answer:

- Variant of PCOS with more severe phenotype:
  - Hyperandrogenism
  - Insulin resistance
  - Acanthosis nigricans

Q2.11: What is idiopathic hirsutism?

Answer:

- Diagnosis of exclusion
- Features:
  - Regular ovulatory cycles
  - Normal serum androgen levels
  - Normal ovarian morphology
  - Increased sensitivity of target tissues to androgens

Q2.12: How is hirsutism treated?

Answer:

- **Treat underlying cause**
- **Pharmacological options:**
  - Combined OCPs (containing cyproterone acetate or drospirenone):
    → Anti-androgenic progestins preferred
  - Anti-androgen drugs:
    → Spironolactone (most preferred)
    → Flutamide (androgen receptor antagonist)
    → Finasteride (5-alpha-reductase inhibitor)
  - GnRH analogs (used as last resort):
    → Not used >6 months due to risk of menopausal symptoms and osteoporosis
- **Important caution:**
  - Anti-androgens must be combined with contraception
  - If pregnancy occurs while on anti-androgens and the fetus is male → risk of feminization

BIG QUESTION 3: What is the role of hyperprolactinemia in menstrual disorders and how is it diagnosed and treated?

Broad Answer: Hyperprolactinemia is an important hormonal disorder that causes menstrual irregularities, infertility, galactorrhea, and hypogonadism by suppressing GnRH secretion. It may be physiological, drug-induced, or pathological (e.g. prolactinoma). Diagnosis is based on serum prolactin levels, and imaging is considered for high levels. Dopamine agonists are the treatment of choice.

DETAILED QUESTIONS

Q3.1: What is prolactin and where is it synthesized?

Answer: Prolactin is a polypeptide hormone synthesized by lactotrophs of the anterior pituitary.

Q3.2: What are physiological causes of hyperprolactinemia?

Answer:

- Pregnancy and lactation
- Nipple stimulation
- Chest wall stimulation (e.g. burns, herpes)
- Sleep
- Stress
- Exercise
- Orgasm

Q3.3: What inhibits prolactin secretion under normal conditions?

Answer: Dopamine acts as **Prolactin Inhibitory Factor**

Q3.4: How does hyperprolactinemia affect the HPO axis?

Answer:

- Inhibits pulsatile secretion of GnRH
- Leads to:
  - Menstrual disturbances
  - Infertility
  - Galactorrhea
  - Hirsutism
  - Hypogonadism (due to estrogen deficiency from HPO axis suppression)

Q3.5: How common is galactorrhea in women with hyperprolactinemia?

Answer:

Clinical Presentation	Prevalence
Galactorrhea	1/3 of women
Isolated galactorrhea with normal prolactin	50%
Amenorrhea + galactorrhea	2/3 of women with high prolactin, among which 1/2 have prolactinoma

Q3.6: What are pathological causes of hyperprolactinemia?

Answer:

- **Drugs:** Dopamine antagonists (e.g. Metoclopramide, antipsychotics)
- **Primary hypothyroidism:** Elevated TRH stimulates prolactin release
- **Prolactinoma:** Prolactin-secreting pituitary adenoma
- **Hypothalamic/pituitary tumors:**
  - Either secrete prolactin
  - Compress pituitary stalk/lactotrophs
- **Chronic renal failure or liver disease** (↓ prolactin clearance)

Q3.7: What level of prolactin is considered abnormally high in non-pregnant women?

Answer: Serum prolactin >20 ng/mL

Q3.8: How is hyperprolactinemia treated?

Answer:

- Treat underlying cause
- **First-line pharmacotherapy:** Dopamine agonists:
  - Cabergoline (preferred over Bromocriptine due to better side-effect profile and dosing ease)
- **Example:**
  - Woman on dopamine agonist for galactorrhea can discontinue treatment once she conceives

BIG QUESTION 4: What is a prolactinoma and how is it diagnosed and managed, especially in pregnancy?

Broad Answer: Prolactinoma is a prolactin-secreting pituitary adenoma. It can be microadenoma or macroadenoma. Treatment is mainly pharmacological. In pregnancy, prolactinomas may enlarge; clinical symptoms guide management rather than serial prolactin levels.

DETAILED QUESTIONS

Q4.1: What are the types of prolactinoma?

Answer:

- Microadenoma: <10 mm
- Macroadenoma: ≥10 mm

Q4.2: What is the treatment of prolactinoma?

Answer:

- First-line: Dopamine agonists (Cabergoline or Bromocriptine)
- Surgery is reserved for:
  - Space-occupying symptoms (e.g. headache)
  - Visual field defects (e.g. bitemporal hemianopia)

Q4.3: How are prolactinomas managed during pregnancy?

Answer:

- Risk of increase in size during pregnancy exists
- However, most prolactinomas **do not** increase in size
- Monitor for symptoms like headache or visual field defects
- Serum prolactin monitoring **not useful** during pregnancy (levels physiologically elevated)
- If symptomatic:
  - Restart dopamine agonists (typically Bromocriptine)

BIG QUESTION 5: How are primary and secondary amenorrhea classified, diagnosed, and managed?

Broad Answer: Amenorrhea is the absence of menstruation and may be primary (failure to menstruate by a specific age) or secondary (cessation of menstruation after it has started). Diagnosis depends on the presence or absence of secondary sexual characteristics, uterus, and hormone levels. Specific conditions include Turner syndrome, Mullerian agenesis, AIS, Swyer syndrome, and hypothalamic/pituitary disorders. Management is tailored to cause and fertility goals.

DETAILED QUESTIONS

Q5.1: How is primary amenorrhea defined?

Answer:

- Absence of menses by:
  - Age 13 years in absence of secondary sexual characteristics
  - Age 15 years in presence of secondary sexual characteristics

Q5.2: What are the most common causes of primary amenorrhea?

Answer:

- **Worldwide:** Gonadal dysgenesis (Turner syndrome)
- **India:** Mullerian agenesis

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Q5.3: What is secondary amenorrhea?

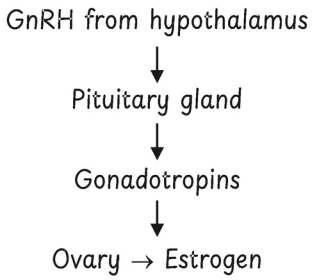
Answer:

- Absence of menses for:
  - 3 consecutive cycles
  - or 6 months in a previously menstruating woman
- Most common cause: Pregnancy
- Most common pathological cause: PCOS

Q5.4: What is the physiological pathway regulating menstruation?

Answer:

- GnRH from hypothalamus → stimulates pituitary
- Pituitary secretes FSH and LH (gonadotropins)
- Ovaries produce estrogen



Q5.5: What are the causes of amenorrhea at the level of the outflow tract?

Answer:

- Normal hormone levels → Eugonadotropic eugonadism
- Abnormalities include:
  - Absent uterus
  - Outflow tract obstruction: Imperforate hymen, transverse vaginal septum
  - Endometrial abnormalities

Q5.6: What are ovarian causes of amenorrhea?

Answer:

- Gonadal failure:
  - Gonadal dysgenesis (e.g., Turner syndrome)
  - Surgical removal of ovaries
  - Chemotherapy/radiotherapy
- Results in:
  - Estrogen deficiency
  - Feedback to hypothalamus/pituitary → ↑ FSH → Hypergonadotropic hypogonadism

Q5.7: What are hypothalamic/pituitary causes of amenorrhea?

Answer:

- Functional GnRH deficiency
- Pituitary tumors
- Low FSH, LH → Estrogen deficiency → Hypogonadotropic hypogonadism

Q5.8: What are clinical features of hypogonadism?

Answer:

- Absent breast development
- Older women: Vaginal dryness, bone pains

Q5.9: How is the clinical approach to primary amenorrhea organized?

Answer:

If breast development is present (estrogen present):

- Check for uterus:
  - **Uterus present + H/o cryptomenorrhea:**
    → Imperforate hymen → Bluish bulge at introitus → Hematocolpos
    → Transverse vaginal septum → P/A lump, P/R exam shows bulge → MRI for depth + associated anomalies → Surgery: Septum resection with graft
  - **Uterus absent + blind vagina:**
    → Pubic hair + → Mullerian agenesis:
      – Ovaries normal
      – 46 XX
      – Normal serum testosterone (20-80 ng/dL)
      – Pregnancy via IVF + surrogacy possible
      – No HRT needed
    → Pubic hair - →Complete AIS:
      – Testes (undescended: intra-abdominal, inguinal canal, or underneath the labia)
      – 46 XY
      – Serum testosterone in male range (200-800 ng/dL)
      – Gonadectomy after puberty
      – Needs estrogen HRT
      – Inherited: X-linked recessive → other females may be affected

If breast development is absent (estrogen deficient):

- Check FSH level: PYQ: FMGE 2020
  - **High FSH → Hypergonadotropic hypogonadism**
    → Do karyotype:
      – Turner syndrome (short stature, streak ovaries, hypoplastic uterus)
      – Swyer syndrome (tall, dysgenetic gonads, uterus +)
      – Gonadal dysgenesis (diagnosis of exclusion)
  - **Low FSH → Hypogonadotropic hypogonadism**
    → Most common cause: Functional GnRH deficiency
    → Constitutional delay → Short woman with normal FSH/LH
    → Tall woman with anosmia: Kallmann syndrome
    → CNS tumor (craniopharyngioma most common)

Q5.10: What are important treatment considerations in primary amenorrhea?

Answer:

- Gonadal dysgenesis → Lifelong HRT (estrogen ± progesterone)
- Y chromosome present → Gonadectomy (Swyer's) due to risk of gonadoblastoma
- Kallmann syndrome → Lifelong HRT
- Pregnancy possible with:
  - IVF + oocyte donation (if uterus present)
  - Ovulation induction (GnRH pulsatile or gonadotropins)

Q5.11: What are the diagnostic possibilities in a patient with primary amenorrhea, breast development present, history of cryptomenorrhea, and uterus present?

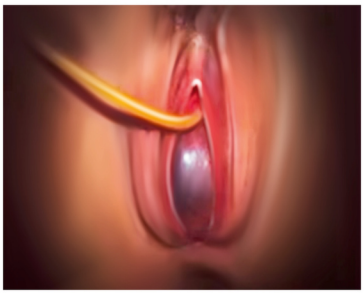
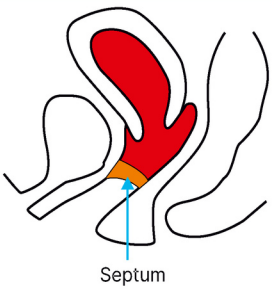
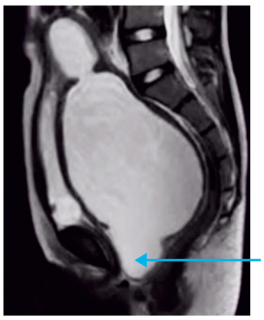
Answer: These findings indicate normal estrogen status (breast development), functional uterus, and possible obstruction to menstrual flow.

Feature	Interpretation
Breast development	Estrogen present (functional ovaries)
Uterus present	Normal Mullerian structures
Cryptomenorrhea	Suggests obstruction to menstrual outflow

Differential Diagnoses:

- Imperforate hymen
- Transverse vaginal septum

Differentiation Table:

Parameter	Imperforate Hymen	Transverse Vaginal Septum
Age at presentation	Early adolescence	Slightly later (mid-late teens)
Appearance of vaginal opening	Bluish bulge at introitus	Normal; no visible bulge at introitus
Effect of Valsalva/coughing	Bulge becomes prominent	No effect
Per-rectal examination	Bulge felt throughout entire vaginal length	Bulge felt only in upper vaginal segment
Menstrual blood collection	Hematocolpos	Hematocolpos, hematometra, hematosalpinx
Associated anomalies	Rare	Frequently associated with other Mullerian anomalies
Diagnosis	Clinical	MRI to determine depth, thickness, and extent
Management	Cruciate incision of hymen	Surgical excision of septum with graft placement
		 

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- **Cryptomenorrhea** = cyclical lower abdominal pain + absence of menstrual flow.
- **Imperforate hymen** is typically diagnosed on local inspection, while **transverse septum** often needs imaging.

Both conditions require surgical management, but their anatomical level and approach differ.

Q5.12: What are the differentiating features of primary amenorrhea with breast development present, uterus absent, and blind vagina?

Answer: This clinical picture suggests adequate estrogenization with absent Mullerian derivatives. The two key differential diagnoses are **Mullerian agenesis** and **Androgen Insensitivity Syndrome (AIS)**.

Feature	Mullerian Agenesis (MRKH)	Complete AIS
Karyotype	46 XX	46 XY
Gonads	Normal ovaries	Testes (undescended: abdominal/inguinal)
Breast development	Present	Present
Pubic and axillary hair	Present	Absent
Serum testosterone	Normal female range (20-80 ng/dL)	Male range (200-800 ng/dL)
Serum FSH	Normal	Normal
Inheritance	Sporadic	X-linked recessive
Risk of gonadal malignancy	No	Yes (gonadectomy after puberty)
Fertility	IVF with surrogacy	Not possible
Hormone Replacement Therapy	Not required	Estrogen HRT required post-gonadectomy

- **Pubic hair** is the most reliable differentiator: absent in AIS due to androgen resistance.
- **Serum testosterone** helps confirm AIS (elevated) vs MA (normal).

Q5.13: What is the diagnostic approach to primary amenorrhea with absent breast development and uterus present?

Answer: This suggests a state of estrogen deficiency with intact Mullerian structures. The main causes lie in the **hypogonadotropic or hypergonadotropic** hypogonadism categories.

Step	Findings/Interpretation
Breast development	Absent → estrogen deficiency
Uterus	Present → Mullerian structures intact
Next step	Check serum FSH

If FSH is ↑ (Hypergonadotropic Hypogonadism):

- Do karyotype

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- Differential diagnoses:
  - Turner syndrome (45,X0)
  - Swyer syndrome (46,XY pure gonadal dysgenesis)
  - Pure gonadal dysgenesis (46,XX)

Feature	Turner Syndrome	Swyer Syndrome	Pure Gonadal Dysgenesis
Karyotype	45,X0	46,XY	46,XX
Height	Short	Tall	Normal
Gonads	Streak ovaries	Streak/dysgenetic gonads	Streak gonads
Uterus	Present	Present	Present
Risk of malignancy	Low	High (Y chromosome → remove gonads)	None
Breast development	Absent	Absent	Absent
Pubic hair	Present	Present	Present
Treatment	Estrogen + Progesterone HRT	Estrogen + Progesterone + Gonadectomy	Estrogen + Progesterone HRT

If FSH is ↓ (Hypogonadotropic Hypogonadism):

- Consider:
  - Functional hypothalamic amenorrhea
  - Constitutional delay (Diagnosis of exclusion)
  - Kallmann syndrome (anosmia)
  - CNS tumors (e.g., craniopharyngioma)
- **MRI Brain** may be indicated
- **Treatment:** Depends on etiology (lifestyle, HRT, ovulation induction)

BIG QUESTION 6: What are the advanced diagnostic clues and clinical presentations in primary and secondary amenorrhea?

Broad Answer: Specific clinical cases of amenorrhea help illustrate unique hormonal patterns and syndromes. These include Turner syndrome, CAH, AIS, and secondary amenorrhea causes like Sheehan syndrome and Asherman syndrome. Hormone assays and imaging assist in diagnosis, and management varies with etiology and fertility goals.

DETAILED QUESTIONS

Q6.1: A 16-year-old girl has primary amenorrhea, height 140 cm, Tanner stage 1 breast development, normal pubic hair, and a uterus. Her LH and FSH are elevated, and USG shows streak ovaries. What is the likely diagnosis?

A. Kallmann syndrome
B. Turner syndrome
C. Swyer syndrome
D. Androgen insensitivity syndrome

Answer: B. Turner syndrome
Explanation:

- Short stature + streak ovaries = Turner
- Kallmann → low FSH
- Swyer → tall, 46XY
- AIS → uterus absent breast development present

Next step: Karyotype to confirm Turner syndrome

Q6.2: An 18-year-old girl presents with primary amenorrhea. She has well-developed breasts and pubic hair. On local exam, vaginal introitus is normal, but cervix is not felt per rectum. What is the likely diagnosis?

A. Androgen insensitivity syndrome

B. Turner syndrome

C. Transverse vaginal septum

D. Mullerian agenesis

Answer: D. Mullerian agenesis

Explanation:

- Normal secondary sexual characteristics
- Absent uterus + blind vagina on exam
- Rules out AIS (no pubic hair), Turner (no breast development)

Q6.3: USG in a girl with primary amenorrhea reveals absent uterus and intraabdominal gonads. Which test helps differentiate Mullerian agenesis from AIS?

A. Serum FSH

B. Serum Estradiol

C. Serum Testosterone

D. Gonadal biopsy

Answer: C. Serum Testosterone

Explanation:

- AIS → high male-range testosterone
- MA → normal female-range testosterone
- FSH, estradiol normal in both
- Biopsy not first-line

Q6.4: A girl with primary amenorrhea, absent breast development, normal uterus, high FSH, and hypertension likely has:

A. Turner syndrome

B. Swyer syndrome

C. 17α-hydroxylase deficiency

D. AIS

Answer: C. 17α-hydroxylase deficiency

Explanation:

- HTN + estrogen deficiency = enzyme block
- FSH ↑ rules out central cause
- Turner → no HTN
- AIS → breasts present

Q6.5: How is outflow tract abnormality suspected?

Answer:

- Primary amenorrhea
- Breast development present
- Uterus present
- Normal hormonal profile
- USG normal
- **Suspicion:** Outflow tract abnormality

Q6.6: How is the progesterone challenge test interpreted?

Answer:

Response	Diagnosis
Withdrawal bleeding +	Constitutional delay of menarche
No withdrawal bleeding	Possibility of genital TB

Q6.7: A 17-year-old girl is tall, has no pubic or axillary hair, absent breast development, and bilateral inguinal masses. USG reveals absence of uterus and ovaries. What is the likely diagnosis?

A. Complete AIS

B. Swyer syndrome

C. Turner syndrome

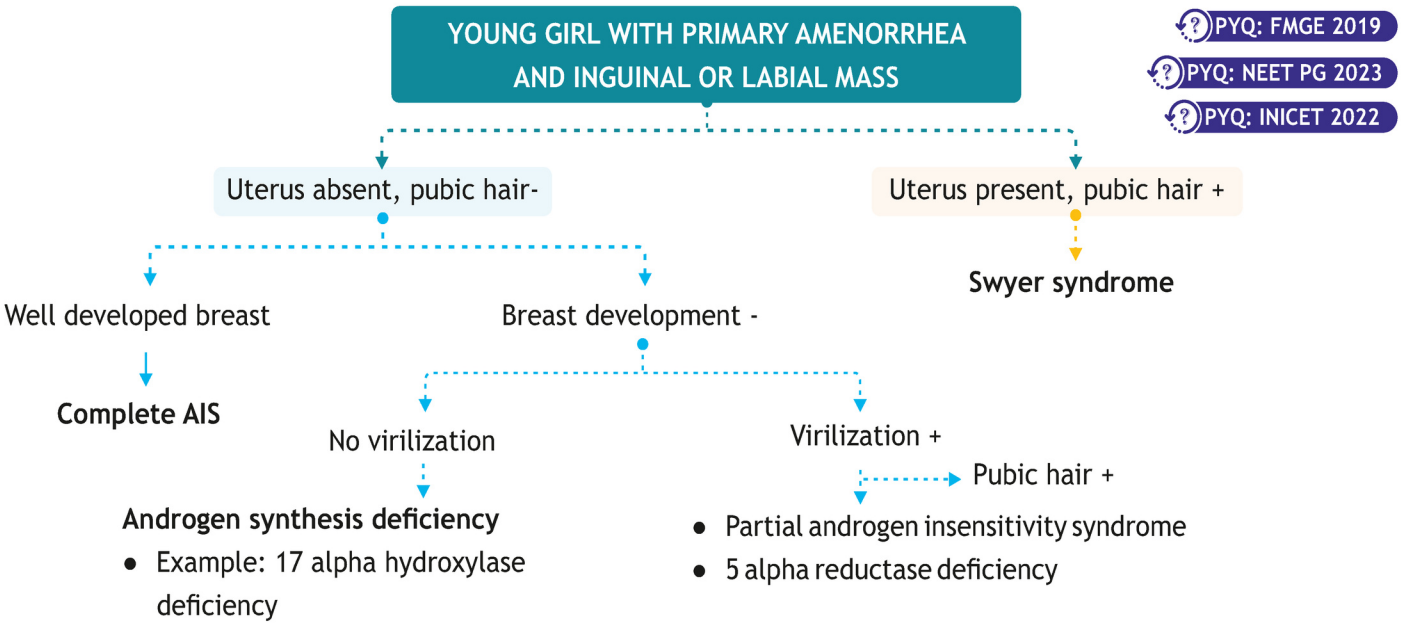
D. Hypergonadotropic hypogonadism

Answer: D. Hypergonadotropic hypogonadism (due to androgen synthesis defect)

Explanation:

- Lack of breast + pubic hair + no estrogen → suggests synthesis block
- AIS → breasts should be present
- Swyer → uterus should be present
- Turner → streak ovaries, not inguinal masses

Q6.8: What is the diagnostic approach in a young girl with primary amenorrhea and an inguinal or labial mass?



Clinical Insight:

- Inguinal/labial mass suggests undescended testes.
- CAIS: No pubic hair, normal breasts, female phenotype.
- 5α-reductase deficiency: Puberty-onset virilization.
- Swyer syndrome: No virilization, uterus present, absent breast development due to gonadal failure.

Q6.9: Which of the following does NOT cause secondary amenorrhea?

A. Kallmann syndrome

B. Fragile X premutation

C. Sheehan syndrome

D. Turner syndrome

Answer: A. Kallmann syndrome

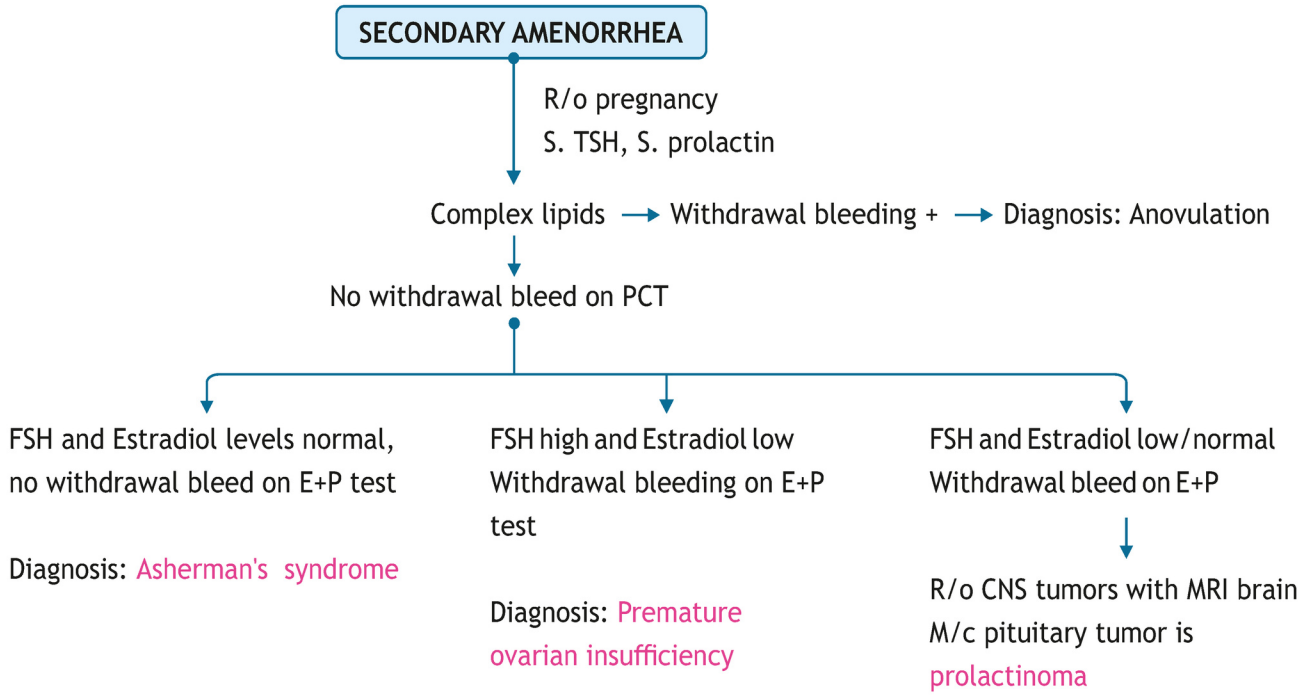
Explanation:

- Kallmann causes primary amenorrhea
- Fragile X → premature ovarian failure
- Sheehan → post-partum pituitary necrosis
- Turner mosaic → secondary amenorrhea possible initially

Q6.10: What is the clinical algorithm for diagnosing secondary amenorrhea?

Answer:

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Q6.11: A 32-year-old athlete presents with amenorrhea for 1 year. BMI: 20 kg/m². No contraception. Complains of vaginal dryness, hot flashes. FSH: 30 IU/L, Estradiol: 50 pg/ml. What is the likely diagnosis?

A. Excessive exercise
B. Premature ovarian insufficiency
C. Anorexia nervosa
D. Primary hypothyroidism

Answer: B. Premature ovarian insufficiency

Explanation:

- FSH is elevated (>20 IU/L), E2 is low → POI
- Hot flashes = estrogen deficiency
- Exercise/anorexia → hypogonadotropic
- TSH normal → rules out hypothyroidism

Normal reproductive age FSH: 5-20 IU/L

Q6.12: What are diagnostic and management principles of premature ovarian insufficiency?

Answer:

- Diagnosis: FSH >40 IU/L on ≥2 occasions, ≥1 month apart
- Evaluate for anti-adrenal and anti-thyroid antibodies
- Causes:
  - Idiopathic (most common)
  - Autoimmune
  - Fragile X premutation
  - Post-surgical, post-radiation
- If <30 years: Evaluate for X chromosome abnormalities
- Management:
  - HRT
  - Pregnancy: IVF with donor oocytes

Q6.13: A 25-year-old woman has amenorrhea for 6 months following D&C for missed abortion. Pelvic exam is normal. No withdrawal bleeding on progesterone challenge. FSH: 6 IU/L. What is the likely diagnosis?

A. Uterine synechiae
B. Premature menopause
C. Pituitary tumor
D. PCOS

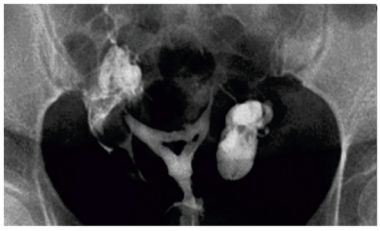
Answer: A. Uterine synechiae (Asherman syndrome)

Explanation:

- History of D&C → endometrial damage
- Normal FSH + no bleed on PCT → end-organ problem
- PCOS → withdrawal bleeding typically present
- Premature menopause → FSH would be high

Q6.14: What are features of Asherman syndrome?

Answer:





- History:
  - Curettage (especially postpartum)
  - Genital TB
- Pathophysiology:
  - Damage to basalis layer of endometrium → impaired regeneration
- Symptoms:
  - Hypomenorrhea
  - Amenorrhea
  - Infertility
- Diagnostics:
  - HSG: Filling defects (uterine synechiae)
  - Hysteroscopy: Confirms diagnosis
- Treatment:
  - Hysteroscopic adhesiolysis

Q6.15: A 30-year-old woman reports 1 year of amenorrhea following a PPH with 4-unit transfusion. She also had failure of lactation, vaginal dryness, and cold intolerance. On exam: loss of pubic/axillary hair. Pelvic exam normal. What is the likely diagnosis?

A. Asherman syndrome
B. Sheehan syndrome
C. Savage syndrome
D. Prolactinoma

Answer: B. Sheehan syndrome

Explanation:

- Classic history: postpartum hemorrhage + lactation failure + panhypopituitarism
- Hair loss + dryness = estrogen and androgen deficiency
- Prolactinoma → galactorrhea, not lactation failure

Q6.16: What is Sheehan syndrome?

Answer:

- Ischemic necrosis of anterior pituitary due to postpartum hemorrhage
- Posterior pituitary is usually spared
- Radiology: Empty sella
- Diagnosis: Clinical + Hormonal profile
- Treatment: Hormone replacement
- Fertility: Ovulation induction with gonadotropins

Q6.17: What is Savage syndrome?

Answer:

- Resistant ovary syndrome (present as ovarian failure)
- Clinical presentation:
  - Primary or secondary amenorrhea
- Pathology:
  - Ovaries + follicles present
  - Follicles have GnRH receptor defects → unresponsive to stimulation

BIG QUESTION 7: What are the key summary tables, diagnostic pearls, and integration points for anovulation, hormonal disorders, and amenorrhea?

Broad Answer: Consolidating knowledge of amenorrhea and hormonal disorders into structured tables and clinical flowcharts enhances diagnostic efficiency and recall. This section summarizes patterns, hormone profiles, diagnostic criteria, and characteristic clinical clues for rapid revision.

DETAILED QUESTIONS

Q7.1: What are the summary hormonal profiles in types of amenorrhea?

Answer:

Type	Estrogen	FSH/LH	Example Conditions
Hypogonadotropic hypogonadism	↓	↓	Kallmann, stress, tumors
Hypergonadotropic hypogonadism	↓	↑	Turner, Swyer, POI
Eugonadotropic amenorrhea	Normal	Normal	Outflow obstruction, PCOS

Q7.2: How do you interpret progesterone challenge test (PCT) results?

Answer:

Result	Interpretation
Withdrawal bleeding	Anovulation
No withdrawal bleed	Check with Estrogen + Progesterone

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Q7.3: What is the result interpretation for E+P challenge test?

Answer:

Result	Interpretation
Withdrawal bleeding	Estrogen deficiency → Anovulation
No withdrawal bleeding	End-organ failure (e.g., Asherman)

Q7.4: What is the difference between Mullerian agenesis and AIS?

Answer:

Feature	Mullerian Agenesis	AIS (Complete)
Karyotype	46 XX	46 XY
Gonads	Ovaries	Testes (undescended)
Breast Development	Present	Present
Pubic/Axillary Hair	Present	Absent
Serum Testosterone	Normal female range	Male range (↑)
Uterus	Absent	Absent
Vagina	Blind-ending	Blind-ending

Q7.5: What is the FSH threshold for diagnosing premature ovarian insufficiency (POI)?

Answer:

- Serum FSH >40 IU/L on two separate occasions, one month apart
- Threshold of concern: >20 IU/L

Q7.6: What are the causes of primary vs. secondary amenorrhea?

Answer:

Primary Amenorrhea	Secondary Amenorrhea
Gonadal dysgenesis (Turner)	Pregnancy (most common overall)
Mullerian agenesis	PCOS (most common pathological)
AIS, CAH	Sheehan, Asherman, POI
Hypothalamic/pituitary tumors	Functional hypothalamic suppression

Q7.7: What are clinical clues pointing to specific syndromes?

Answer:

Clue	Likely Diagnosis
No uterus + pubic hair -	AIS
No uterus + pubic hair +	Mullerian agenesis

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Short stature + streak ovaries	Turner syndrome
Tall, no smell (anosmia)	Kallmann syndrome
Amenorrhea + breast dev - + HTN	17α-hydroxylase deficiency
Postpartum amenorrhea + no lactation	Sheehan syndrome
Post-D&C amenorrhea + no PCT response	Asherman syndrome

Q7.8: What are the first-line treatments across these disorders?

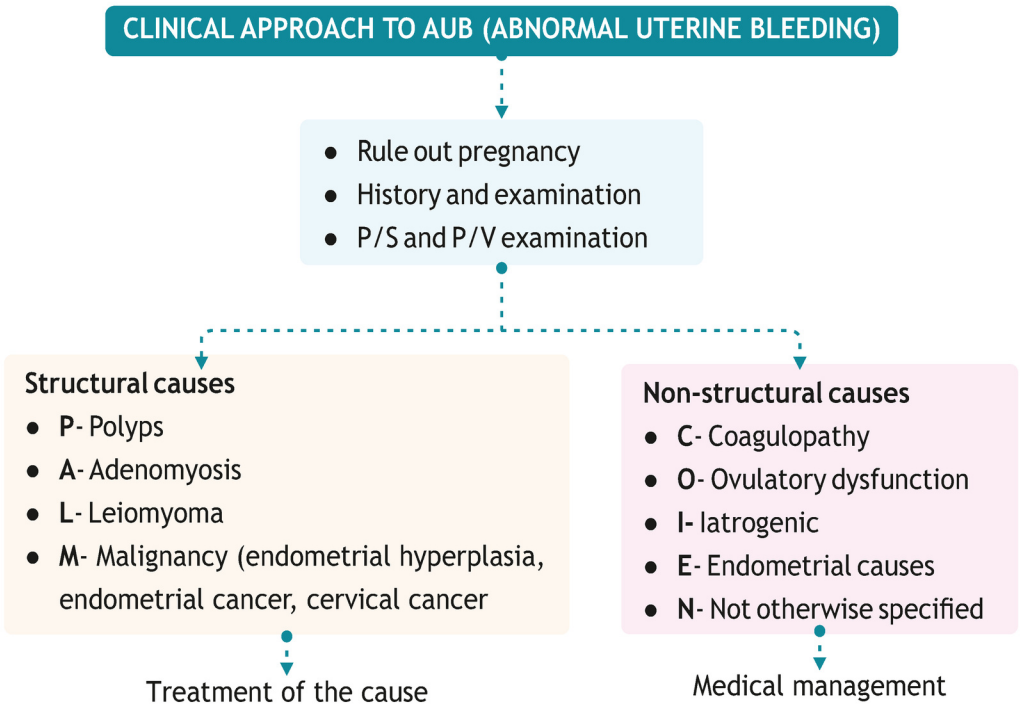
Answer:

Condition	First-line Management
PCOS	OCP, Letrozole (if fertility desired)
Hyperprolactinemia	Cabergoline
Hypogonadotropic amenorrhea	Lifestyle, GnRH pulsatile/Gonadotropins
POI	HRT, IVF with donor oocytes
AIS	Gonadectomy after puberty, Estrogen HRT
Turner/Swyer	Karyotyping, Gonadectomy (if Y+), HRT
Asherman	Hysteroscopic adhesiolysis
Sheehan	Hormone replacement

5. CLINICAL CONDITIONS OF REPRODUCTIVE AGE GROUP

BIG QUESTION 1: What is the clinical approach to AUB (Abnormal Uterine Bleeding)?

Broad Answer:



DETAILED QUESTIONS

Q1.1: What is the investigation of choice in AUB?

Answer: Transvaginal scan

Q1.2: What is the most common coagulation disorder in women in the reproductive and pubertal age group?

Answer: The most common causes of coagulation disorders in females are:

- Reproductive age group: ITP (Immune Thrombocytopenic Purpura)
  - 20% women in reproductive age group have coagulation disorders
- Pubertal age group: Von Willebrand disease
  - 20% of girls may have coagulation disorder

Q1.3: What is the most common cause of AUB in pubertal girls and women in perimenopausal age group?

Answer: Anovulatory cycles

Q1.4: What are the indications for endometrial aspiration?

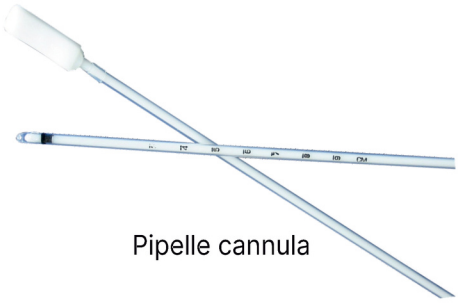
Answer: The indications for endometrial aspiration are:

- Age >**40 years**
- Can be done in younger women if **ET >12 mm**
- Multiple risk factors for endometrial cancer, failed medical management
- Prolonged h/o **anovulatory cycles**

Q1.5: Which cannula is used in endometrial aspiration?

Answer: The cannula which can be used for endometrial aspiration:

- **Pipelle cannula**
  - Single hole
  - Markings denoting uterocervical length
- **Karmann's cannula (number 4)**
  - 2 openings



Pipelle cannula

Q1.6: What are the indications for hysteroscopy for AUB?

Answer: Indications are:

- Strong clinical suspicion of intracavitary lesion
- Persistent **intermenstrual bleeding**
- Persistent symptoms even after curettage/normal endometrial aspiration

Q1.7: Which drugs are used in the medical management of AUB?

Answer: Drugs for medical management of AUB:

- **AUB-C**
  - 1st line drug: Tranexamic acid
  - 2nd line drug: Hormonal T/t
  - NSAIDs are not used
- Combined OCPs
  - 1st line for AUB-O
  - Both Tranexamic acid and Combined OCPs are 1st line but Combined OCPs are preferred.
- Progesterone therapy
  - Before starting hormonal therapy, endometrial hyperplasia and cancer should be ruled out.
  - Can be given in oral/injectable form
  - Mirena (Levonorgestrel-IUD) → Most preferable in cases with oestrogen contraindications
    - → Preferable in older woman, perimenopausal woman, obese, multiple risk factors
    - → Provides contraceptive benefits
    - → Preferred in women not wanting to use OCPs
  - Ormeloxifene
  - GnRH analogues (last resort)

Q1.8: What is the use of ethamsylate in medical treatment of AUB?

Answer: Ethamsylate is **anti-fibrinolytic** drug but not approved and not used in medical treatment of AUB.

Q1.9: A 40-year-old, obese, multiparous woman complains of heavy menstrual bleeding over the past 2 years. She has delayed cycles coming every 3-4 months, followed by 10-14 days of heavy bleeding. Her physical exam is normal, pelvic USG is normal. What should be done next?

Answer: Endometrial aspiration

Q1.10: What are the indications for endometrial ablation in AUB?

Answer: Endometrial ablation:

- It is a conservative surgical option indicated for woman who:

- Is a case of failure of medical treatment
- Want to avoid hysterectomy
- Not a candidate for major surgery

- It is not an option when future fertility is desired
- Utility has ended nowadays (due to Mirena availability)

BIG QUESTION 2: What is endometrial hyperplasia, and what is the risk of its progression to endometrial cancer?

Broad Answer: The risk of progression of endometrial hyperplasia to endometrial cancer depends on type of hyeprplasia.

Type of Hyperplasia	Risk Percentage
Simple hyperplasia	1%
Complex hyperplasia	3%
Simple hyperplasia with atypia	8%
Complex hyperplasia with atypia	29%

- Atypical hyperplasia considered as premalignant

DETAILED QUESTIONS

Q2.1: What is the most important risk factor for endometrial hyperplasia?

Answer: Chronic **unopposed estrogen exposure** (estrogen tumors) to endometrium with prolonged history of anovulatory cycles.

Q2.2: What is the drug associated with endometrial hyperplasia?

Answer: Tamoxifen

Q.2.3: What is the managemtn of endometrial hyperplasia?

Answer: Management of endometrial hyperplasia:

- Rule out pregnancy and resuscitate patient depending on hemodynamic status
- **TVS (transvaginal scan):** Measure ET (endometrial thickness).
- Dilatation and curettage and OCPs (for control of acute bleeding)
- **Therapeutic curettage:** Done in acute heavy menstrual bleeding in case of thick endometrium (in older woman).

Q2.4: What is the treatment for hyperplasia with and without atypia?

Answer: Treatment for hyperplasia:

- **Without atypia**
  - Progesterone therapy (preferably Mirena)
- **With atypia**
  - Simple total hysterectomy

Q2.5: A 35-year-old multiparous woman complaint of heavy bleeding for the past 20 days. She has h/o delayed cycles followed by episodes of heavy bleeding over the past 1 year. Her vitals are stable. Pelvic exam is normal. What should be done next?

Answer: Urine pregnancy test (UPT)

YOURWISH

Q2.6: What are the hormonal treatment options for managing acute abnormal uterine bleeding?

Answer: Medical/hormonal control of acute AUB:

- Thick endometrium under influence of estrogen → Progesterone therapy/high dose OCPs
- Thin endometrium → Estrogen therapy to rebuild endometrium → Progesterone therapy
- Later on put on regular method of hormonal control

BIG QUESTION 3: What are the clinical features, methods of diagnosis, and management of endometrial polyps?

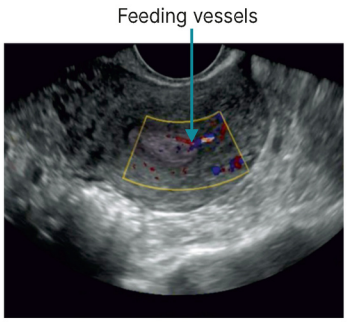
Broad Answer: Endometrial polyps typically cause intermenstrual bleeding but can cause heavy menstrual bleeding, and can be associated with irregular cycles. They can also be associated with infertility.

DETAILED QUESTIONS

Q3.1: What is the finding on USG doppler and transvaginal scan in endometrial polyp?

Answer: Findings:

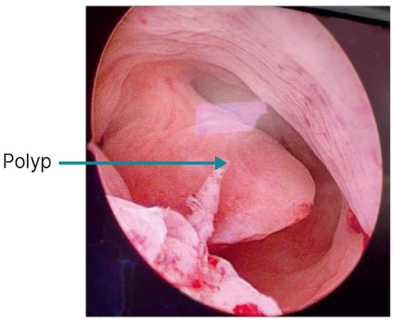
- USG Doppler: Hyperechoic lesion with **"feeding vessel"** sign.
- TVS: Irregular endometrial stripe.



TVS (Color doppler)

Q3.2: What is the most effective method for diagnosing endometrial polyps?

Answer: Best diagnosed by: Hysteroscopic polypectomy.



Hysteroscopy

Q3.3: What is the treatment of symptomatic endometrial polyps?

Answer: Hysteroscopic polypectomy


Polypectomy

BIG QUESTION 4: Compare and contrast fibroids (leiomyomas) and adenomyosis with respect to pathology, clinical features, diagnosis, and management.

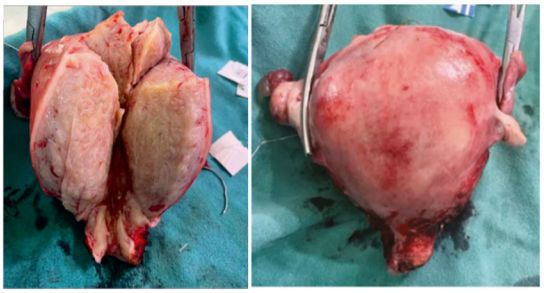
Broad Answer: Fibroids are benign smooth muscle tumors of the uterus presenting with pressure symptoms and menorrhagia, while adenomyosis is ectopic endometrial tissue within the myometrium causing a diffusely enlarged, tender uterus and dysmenorrhea; both are diagnosed with imaging and managed by medical or surgical methods depending on symptoms and fertility needs.

DETAILED QUESTIONS

Q4.1: What is the difference in pathology of fibroid and adenomysis?

PYQ: NEET PG 2018
PYQ: FMGE 2020

Answer:

Fibroid	Adenomyosis
Pathology	
• Benign, monoclonal smooth muscle tumor. • Well circumscribed, vascular pseudo-capsule, whorled appearance on cut section. 	• Endometrial glands and stroma within myometrium. • Appearance: Diffuse myometrial hyperplasia and hypertrophy with no characteristic whorled appearance. 

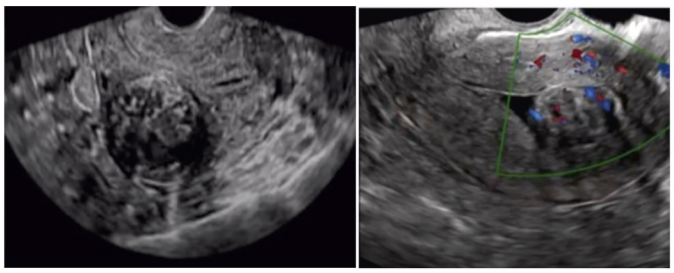
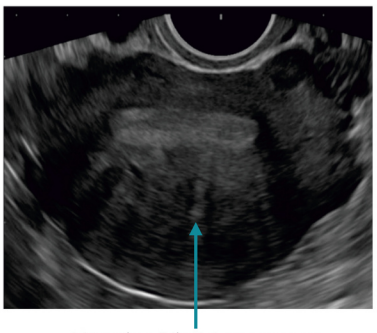
Q4.2: Differentiate between clinical presentations of fibroid and adenomyosis.

Answer: Clinical presentations are:

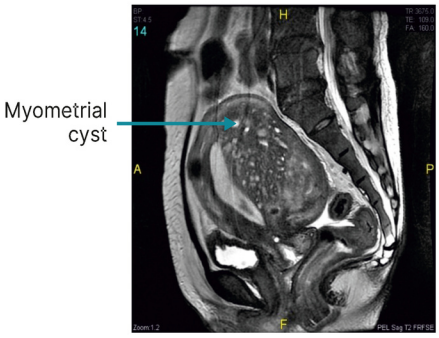
Fibroid	Adenomyosis
• M/c in nulliparous woman • Dysmenorrhea is uncommon feature • Examination: Enlarged uterus, irregular in outline, firm (extracellular matrix) and non-tender.	• M/c in multiparous woman • Severe congestive dysmenorrhea • Examination: uterus is uniformly enlarged (about 10-14 weeks size), globular, soft and tender.

Q4.3: What are the findings in pelvic USG of fibroid and adenomyosis?

Answer: Pelvic USG findings are:

Fibroid	Adenomyosis
 Intramural fibroid Submucosal fibroid • Well defined hypoechoic, heterogenous mass • Peripheral vascularity	 Venetian Blind Appearance • Loss of endo-myometrial junction • Thickened myometrium more posteriorly as compared to anterior myometrium • Myometrial cyst • Venetian blind appearance • Sometimes: "Salt and pepper appearance"

BIG QUESTION 5: What MRI features are used to diagnose adenomyosis?

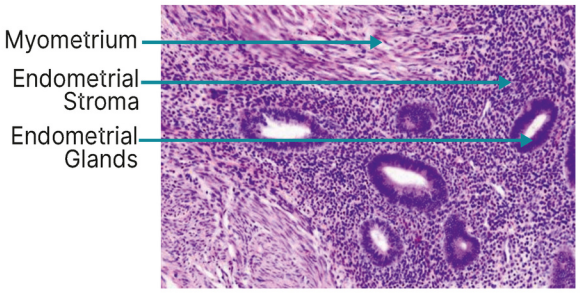


Broad Answer: When ultrasound findings are inconclusive, **MRI** is used to confirm the diagnosis of adenomyosis.

- **MRI:** Junctional Zone Thickness (inner myometrium)
  - o **>12 mm:** Likely adenomyosis
  - o **<8 mm:** Rules out diagnosis
  - o Myometrial cyst can also be appreciated on MRI

DETAILED QUESTIONS

Q5.1: What is the definitive method for diagnosing adenomyosis?



Adenomyosis

Answer: Final diagnosis (confirmation): HPE (histopathological examination) on hysterectomy specimen

- Presence of endometrial glands and stroma → 1hpf deep to junctional zone

Q5.2: What is the definitive treatment of adenomyosis?

Answer: **Treatment**

- Simple hysterectomy (most woman - multiparous, family completed)
- Progesterone therapy (younger woman with strong desire for future fertility)

BIG QUESTION 6: What is etiopathogenesis of fibroids?

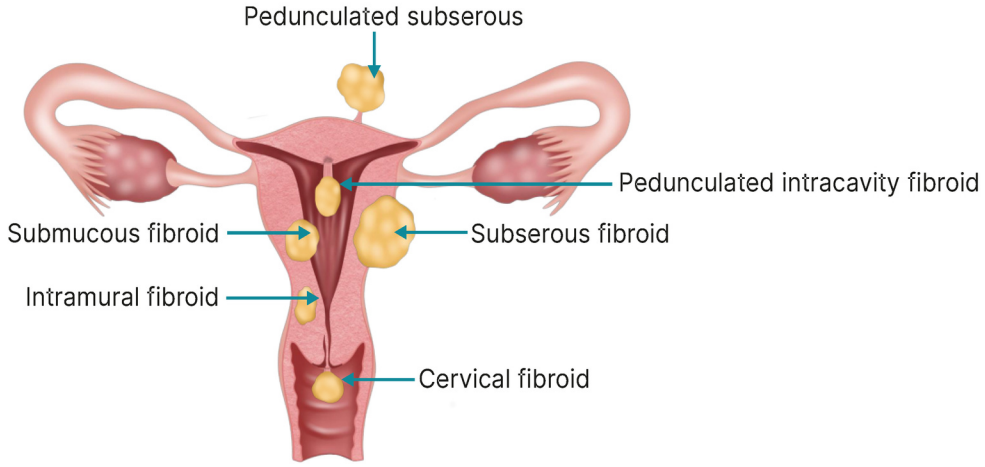
Broad Answer: Fibroid etiopathogenesis:

- **Hormonal factor:** Both estrogen and progesterone are responsible for growth
- **Genetic:** Can be a/w tumor specific chromosomal rearrangements like **t(12,14)**, deletion involving chromosome 7.
- **Protective factor:** Smoking, exercise and multiparity
- OCPs do not increase risk of fibroids

DETAILED QUESTIONS

Q6.1: Fibroids arise from?

Answer: Fibroids arises from body of uterus and all fibroids are intramural (m/c type of fibroid) to begin with.



Q6.2: What are the clinical features of fibroids?

Answer: Clinical manifestations are:

- Asymptomatic (most common presentation)
- Heavy menstrual bleeding (menorrhagia) - M/c complaint
  - Contributed most likely by: Submucous > Intramural> Subserous
- Intermenstrual bleeding (pedunculated intracavitary/fibroid polyp)
- Associated with infertility
  - Submucous > Intramural > Subserous
- Fibroid to undergo torsion - Intracavitary pedunculated/subserous pedunculated
- Squamous metaplasia never ocurs

Q6.3: What causes pain in patients with fibroids?

Answer: Torsion, infected myoma, submucous fibroid polyp and red degeneration of fibroid due to associated diseases.

Q6.4: Write in brief about fibroid degeneration?

Answer: Fibroid degeneration:

- Most common: **Hyaline degeneration**
- Extremely rare: Sarcomatous degeneration
  - Almost never happens in younger premenopausal women
  - If happens, can occur in postmenopausal women
- Calcareous degeneration: Mostly seen in subserous fibroid

Q6.5: What is the site of degeneration and deposition in fibroid?

Answer: In fibroid:

- Degeneration/necrosis: Predominantly occurs in centre (least vascular part)
- Deposition: Tends to occur in periphery

Q6.6: What is red degeneration of fibroids?

Answer: Red degeneration (Carneous degeneration):

- M/c occurs during 2nd trimester of pregnancy
- There is increased risk of preterm labor
- Clinical features: Pain, nausea, vomiting, fever, mild leukocytosis.
- **Management:** Conservative and hospitalization
  - IV fluids
  - Antipyretics
  - Analgesics
  - Routine antibiotic prescription is not needed

Q6.7: What are broad ligament fibroids?

Answer: Broad ligament fibroids:

- **True broad ligamentfibroid**
  - Ureter and uterine artery medial to it
- **Pseudo (false) broad ligament fibroid**
  - Subserous fibroid arising from uterus going towards broad ligament
  - Ureter and uterine artery displaced laterally

YOURWISH

Q6.8: What is the management of fibroid?

Answer: Management:

- Asymptomatic: Expectant management
- Fibroids contributing to infertility: Myomectomy
- Fibroids causing AUB: 1st medical management → Fails → Surgery
- Fibroids causing pressure symptoms: Surgical management preferred

Q6.9: What is the role of hysterectomy in fibroids?

Answer: Role of hysterectomy:

- Postmenopausal woman with symptomatic/rapidly growing fibroid (potential for malignancy)
- >40 years, family complete and definitive management of symptoms

Q6.10: What are the drugs that shrink the size of fibroids?

Answer: Drugs that shrink size of fibroids:

- Mifepristone, Ulipristal acetate
- GnRH analogue, aromatase inhibitors
  - o GnRH analogues shrink the fibroids → Fibroids regrow
    - → Amenorrhea induced → Unable to conceive while on therapy
- Gestrinone and Danazol
- Decrease size of fibroids before surgery → Facilitate minimally invasive surgery
- Can be used alternative to surgery (eg- perimenopausal women, medically unfit/unwilling for surgery).

Q6.11: What is the diagnosis of leiomyosarcoma?

Answer: Leiomyosarcoma:

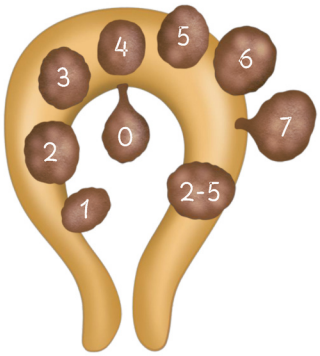
- Mostly arise de novo
- **Diagnosis:** HPE on hysterectomy specimen
  - o >10 mitotic figures/10 hpf

PYQ: FMGE 2020, 2021

PYQ: AIIMS 2019

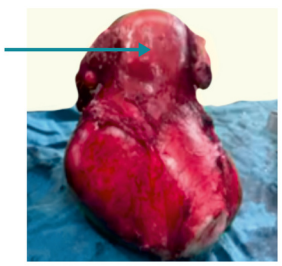
Q6.12: What is FIGO Classification of Fibroids?

Answer: FIGO Classification of Fibroids:

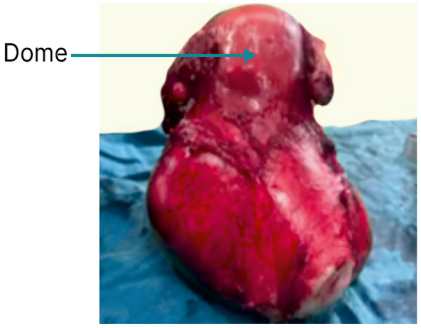


- Type 4: Intramural
- Type 0: Submucous intracavitary pedunculated
- Type 1: Submucous but <50% intramural
  - o For FIGO type 0 and type 1: Hysteroscopic myomectomy
- Type 2: Submucous but >50% intramural
- Type 5, 6, 7 (subserous) and Type 0, 1, 2 (submucous) are mirror images to each other
- Intramural and submucous fibroid can be removed abdominally/laparoscopically

Q6.13: Below is an image of a hysterectomy specimen of a 47-year-old multiparous woman with complains of irregular heavy bleeding + repeated episodes of urinary retention and hydronephrosis, name the finding?



Answer: Image shows cervical fibroid → Dome on St. Paul appearance



Q6.14: A hysteroscopic specimen of a 47-year-old multiparous woman with complaints of irregular heavy bleeding + postcoital bleeding is given. What does it depict?



Answer: Image depicts: Submucous fibroid polyp

- Fibroids cause symptoms according to their size and location
  - Fibroid in lower uterine segment/cervical fibroid → Urinary frequency + Urinary urgency

Q6.15: Below is a hysteroscopic image of a 32-year old woman with infertility and h/o heavy menstrual bleeding. What is the best diagnosis of submucous fibroid?



Answer: Best diagnosis for submucous fibroid: Hysteroscopy

Q6.16: What is the image shown below indicate?



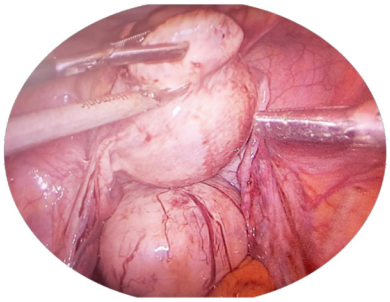
Answer: Saline infusion sonography → Better visualization of intracavitary lesions/submucous fibroids

Q6.17: What does the image below depicts?



Answer: Abdominal myomectomy for removal of intramural fibroid.

Q6.18: What does the image below depict?



Answer: Laparoscopic myomectomy for removal of subsrous fibroid.

- Wherever feasible and available, laparoscopic myomectomy preferable as it is minimally invasive.

Q6.19: Name the instrument shown below:



Answer: **Bonney's myomectomy clamp**

- Used in myomectomy to place it in a manner that uterine arteries are clamped
- To decrease blood flow to surgical field.

Q6.20: Name the instrument depicted below:



Answer: Myoma screw: Used in myomectomy surgeries

Q6.21: What are the prerequisites for myomectomy?

Answer: Prerequisites for myomectomy are:

- Correction of anemia
- Rule out endometrial hyperplasia
- Rule out other causes of infertility
- Consent for potential hysterectomy

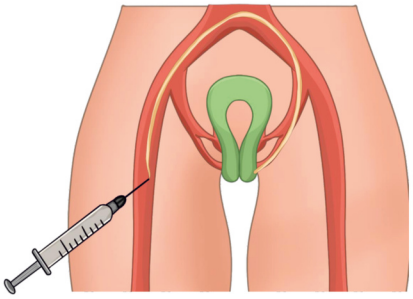
Q6.22: A 32-year-old woman on workup for primary infertility is found to have 2 intramural fibroids of size 4 cm & 7 cm, blocking the tubal ostia. What is the preferred course of management?

Answer: Laparoscopic myomectomy

BIG QUESTION 7: What is uterine artery embolization, and what are its mechanism, indications, and contraindications?

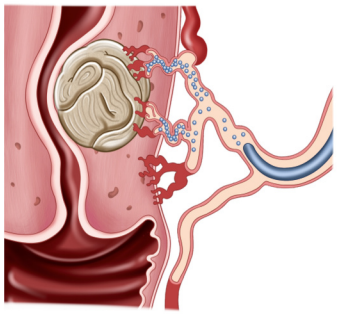
Broad Answer: It is an image guided interventional radiological (angiographic) procedure.

DETAILED QUESTIONS



Q7.1: What is the procedure for uterine artery embolization?

Answer: Percutaneous single femoral artery cannulation through which, B/L uterine artery is catheterized and occluded using gelatin microspheres for polyvinyl alcohol particles.



Q7.2: What is the mechanism of uterine artery embolization?

Answer: It causes ischemic necrosis of fibroids as it deprives blood flow of fibroid.

Q7.3: Uterine artery embolization is suitable for?

Answer: It is suitable for people who are symptomatic enough to need surgery but unfit/unwilling for surgery.

Q7.4: Uterine artery embolization is not suitable for?

Answer: It is not preferred for:

- Calcified fibroids, submucous intercavitary and subserous pedunculated fibroids.
- People desiring future fertility (can depreive endometrial lining and ovary blood supply).

BIG QUESTION 8: What are the types of vaginitis?

Broad Answer: Types of vaginits:

Bacterial vaginitis	Candidiasis	Trichomoniasis
• Lactobacilli replaced by gram negative rods (expecially Garnerella vaginalis). • Not STI (sexually transmitted infection)	• M/c vaginitis in pregnancy • Can transmit sexually, but not STI • Risk factors: DM, prolonged Antibiotics, pregnancy, immunocompromised	• STI (sexually transmitted infection)

DETAILED QUESTIONS

Q8.1: How to differentiate vaginitis in the basis of vaginal discharge on P/S examination?

Answer:

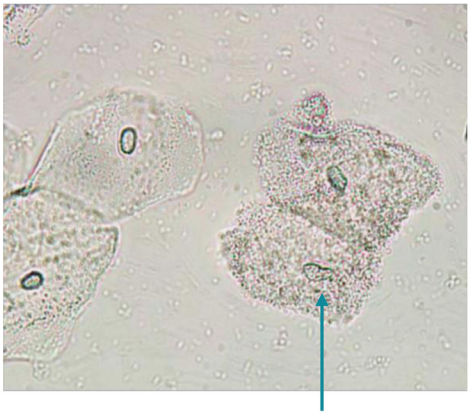
Type of Vaginitis	Bacterial vaginitis	Candidiasis	Trichomoniasis
Vaginal discharge	• Thin grey-white discharge • Foul smell • No itching	• Curdy white, cottage cheese like discharge • Itching ++ • Dysuria +	• Characteristic greenish yellow discharge • Itching ++ • Dysuria +
Vaginal pH	Alkaline >4.5	Acidic <4.5	Alkaline >4.5

Q8.2: How can different types of vaginitis be distinguished using microscopy, the Whiff test, and the gold standard diagnostic method?

Answer:

Type of Vaginitis	Bacterial vaginitis	Candidiasis	Trichomoniasis
Wet Smear (Saline M/E)	• **IOC** • Clue cells • No WBCs	KOH prep: • Fungal pseudohyphae • WBCs +	• Motile flagellated organism • WBC +
Whiff Test (KOH)	Positive	Negative	Positive
Gold Standard	On Gram stain, **Nugent scoring** done.	Culture	Culture

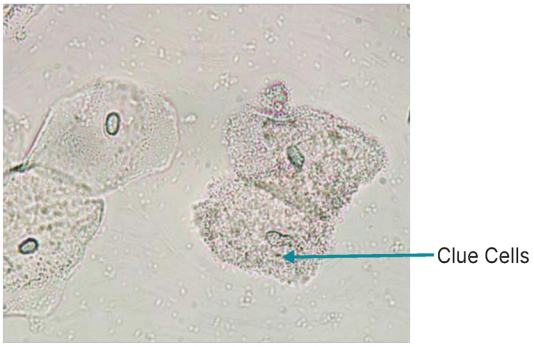
Q8.3: Identify the structure marked in the given image.



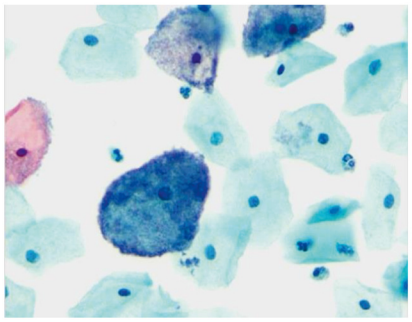
YOURWISH

YOURWISH

Answer: **Clue cell:** Vaginal epithelial cells having fuzzy borders on wet smear in bacterial vaginitis.



- **Cytology:** Not done for detection of clue cells but can be picked on cytology.
  - Vaginal epithelial cells studded with bacteria



Q8.4: What is the clinical criteria for diagnosis of bacterial vaginosis?

Answer: **Amsel's criteria:** (3 out of 4 should be present)

- Vaginal discharge characteristics
- Vaginal pH
- Clue cells on microscopy
- Whiff test

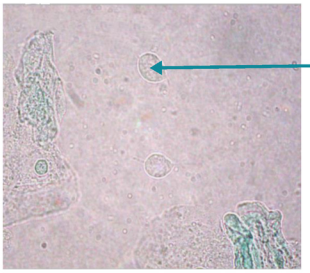
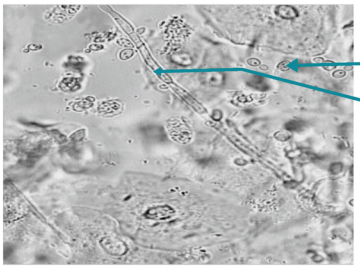
Q8.5: What is the drug of choice for bacterial vaginosis?

Answer: Metronidazole

- DOC in pregnancy: Metronidazole
  - 1st trimester: Vaginal route
  - 2nd and 3rd trimester: Oral can be given
- Partner treatment not needed (not STI)

Q8.6: What are the microscopic findings and management of Trichomonas vaginalis infection and candidiasis?

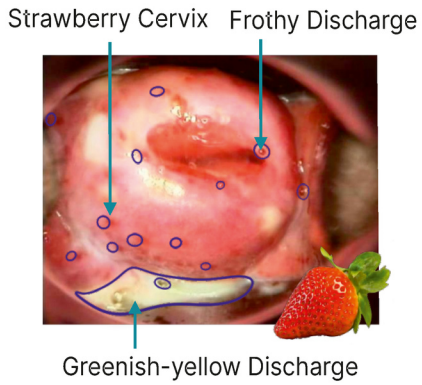
Answer: Differences are:

Features	*Trichomonas vaginalis*	Candidiasis
Microscopy	• Motile flagellated organism with "tennis racquet appearance". 	• Fungal pseudohyphae and yeast cells can be see in candidiasis. 

Treatement	• DOC: **Metronidazole** • Partner treatment is given	• DOC: Fluconazole • In pregnancy: Clotrimazole vaginal pessary • Partner treatment not needed

Q8.7: What is strawberry cervix?

Answer: **Strawberry cervix:** Greenish yellow discharge and red dots on cervix which can also be present on vagina. It is seen in *Trichomonas vaginalis* infection.



BIG QUESTION 9: How to approach to a patient with complain of vaginal discharge?

Broad Answer: The approach is:

C/O VAGINAL DISCHARGE

→ History and examination

Discharge from vagina and cervix is healthy

→ vaginitis

- Test done to identify type of discharge
- Syndromic treatment done:
  - o Bacterial vaginosis
  - o Candidiasis
  - o Trichomoniasis

Discharge coming out of the os Cervix : Unhealthy

→ Cervicitis

Uterine/adnexal/cervical motion tenderness

→ Infection ascended upwards

→ PID (pelvic inflammatory disease)

- Gram stain: WBC present but no organisms seen: presumptive diagnosis → **Chlamydia**
- WBC present and gram-negative intracellular diplococci seen: presumptive diagnosis → **Gonorrhea**

DETAILED QUESTIONS

Q9.1: What is the investigation of choice to differentiate between Chlamydia and Gonorrhea infection?

Answer: NAATs (Nucleic Acid Amplification Tests): Expensive and not always available.

Q9.2: What is the gold standard investigation to differentiate between Chlamydia and Gonorrhea infection?

Answer: Culture

Q9.3: Which antibiotics are preferred in Chlamydia and Gonorrhea infections?

Answer: Antibiotics preferred are:

Antibiotics	Chlamydia	Gonorrhea
Preferred	Doxycycline 100 mg BD for 7 days	Ceftriaxone 500 mg IM + Doxycycline 100 mg for 7 days (for coverage to Chlamydia as often exist together)
Alternative	Azithromycin 1gm - Single dose	Ceftriaxone 500 mg IM + Azithromycin 2gm single dose

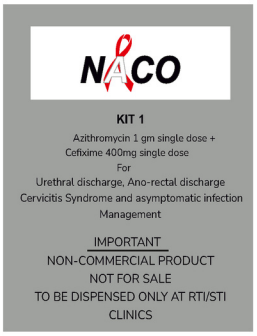
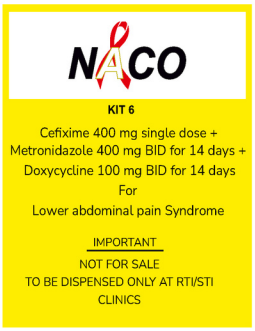
Q9.4: Which antibiotics are safe in pregnancy?

Answer: In pregnancy:

- **Contraindicated:** Doxycycline and fluoroquinolones
- **Safe to use:** Ceftriaxone + Azithromycin

Q9.5: What are the purposes of NACO (National AIDS Control Organisation) kits 1, 2, and 6?

Answer: NACO (National AIDS Control Organisation) kits are:

Kit	Kit 1	Kit 2	Kit 6
Image			
Purpose	• For Cervical discharge • Symptomatic partner also treated **Contains:** Azithromycin + Cefixime	• For vaginal discharge • Symptomatic partner also treated	• For PID/Pelvic pain • Partner: Treated by Kit 1 (Kit 1 contain azithromycine and cefixime effective against Chlamydia and Gonorrhea responsible for ascending infections and PID)

BIG QUESTION 10: What are the causative agents, clinical features, methods of diagnosis, and management of pelvic inflammatory disease (PID)?

Broad Answer: M/c route of infection: Ascending (most infections are polymicrobial).

- With ascending infection, Endosalpingitis occurs 1st.

DETAILED QUESTIONS

Q10.1: Which is the most common organism involved in PID?

Answer: M/c common infective organism: **Chlamydia > Gonorrhea.**

- PID in virgin females: Genital TB
- PID in post-menopausal females: *E.coli*
- Actinomyces infection is typical in IUD users

Q10.2: Which organism causes the most severe tubal damage in pelvic inflammatory disease (PID)?

Answer: Tubal damage is more extensive with **Chlamydia > Gonorrhea**

Q10.3: What are the clinical manifestations of PID?

Answer: Clinical manifestations are:

- Majority of Chlamydial infections of endocervix: Asymptomatic
- Remains unidentified for long duration of time
- Gonorrhea can present as vulvovaginitis (more intense infection)
- Septic abortions and Puerperal sepsis
  - More probability of anaerobic infections → Pelvic cellulitis and Exosalpingitis (1st)

Q10.4: What is the clinical staging of PID?

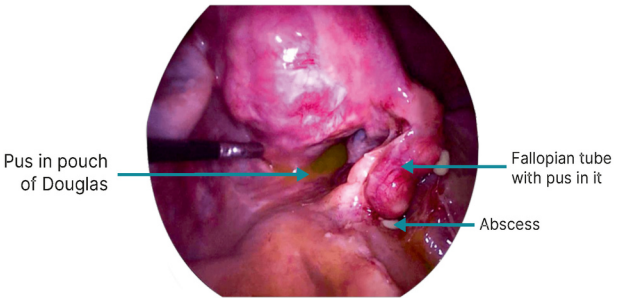
Answer: Gainesville staging: Tells about clinical severity of infection

Q10.5: What is the criteria for diagnosis of PID?

Answer: Diagnosis Criteria for PID (essentially clinical diagnosis):

Criteria	Description
Minimum Criteria	Any of 3 should be there: • Uterine/adnexal/cervical motion tenderness

Additional Criteria	• Fever: Acute PID
	• Mucopurulent cervicitis: WBC on saline, microscopy of vaginal fluid
	• Leukocytosis
	• Cervical diagnosis +ve for Chlamydia and Gonorrhea
	  ○ Endocervical swab
	  ○ Mucopurulent discharge

Definitive Criteria	• USG showing **tubo-ovarian abscess** • Endometritis on endometrial biopsy • Laparoscopic evidence of salpingitis ○ Pus coming out of fimbrial end of fallopian tube → Definitive criteria for salpingitis → PID 

Q10.6: What is the most common cause of tubal factor infertility in India?

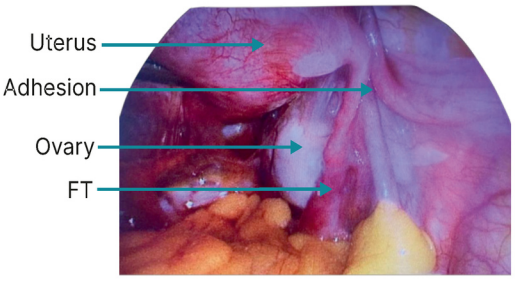
Answer: PID (pelvic inflammatory disease)

Q10.7: What is the laparoscopic finding in clinical context of infertility in PID patient?

Answer: Laparoscopic evidence can be found in clinical context of infertility in PID.

Findings of a woman who underwent diagnostic laparoscopy during evaluation for infertility:

- Thickened tube
- Adhesions inside pelvis
- Matted tubo-ovarian mass may be visible

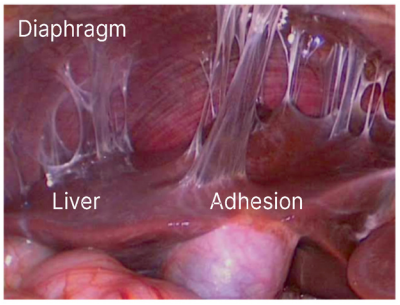


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Q10.8: What is the finding in Fitz Hugh Curtis Syndrome?

Answer: Violin string adhesions on the undersurface of diaphragm

- History: Woman with multiple episodes of PID, treated in past, now complaining of repeated pelvic pain → Now complains of right upper quadrant pain.



Fitz Hugh Curtis syndrome

Q10.9: What is Boer Meisel system?

Answer: **Boer Meisel System:**

- It describes the prognosis of pregnancy outcome.
- Laparoscopy → Condition of tubes → Thickened tubes, hydrsalpinx → Look for likely pregnancy outcome in patient.

Q10.10: What are the TVS findings of a woman undergoing evaluation for infertility with PID?

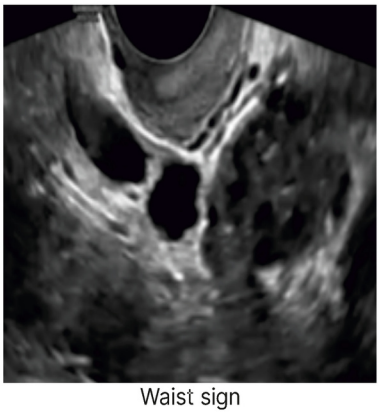
Answer: Transvaginal scan (TVS) findings:

- Clinical findings showed: B/L, non-tender cystic adnexal masses, h/o multiple episodes of PID in past → suggestive of **Hydrosalpinx** → Tubal dilatation and flimsy scars present → **Cogwheel sign.**



Cogwheel sign

- Dilated fallopian tube with septa inside → **Waist sign**



Waist sign

Q10.11: What are the indications for hospitalization in acute PID?

Answer: Indications for hospitalization with acute PID:

- Suspected pelvic abscess
- Clinically severe disease
- Pregnant
- Unable to tolerate oral treatment
- No clinical response to oral treatment

Q10.12: What is the management of PID?

Answer: Management:

- **Medical management:**
  - Ceftriaxone + Doxycycline + Metronidazole (IV regime preferred)
- **Surgical management:**
  - Drainage of pelvic abscess
  - Ruptured tubo-ovarian abscess

- Peritonitis not responding to antibiotics
- Evacuation of uterus in the setting of retained POCs and septic abortions

BIG QUESTION 11: What are the common sites, routes of spread, clinical manifestations, methods of diagnosis, and management of genital tuberculosis?

Broad Answer: Genital Tuberculosis:

- Almost always secondary
- M/c primary site: Pulmonary tuberculosis
- M/c site of infection: Fallopian tube > Endometrium

DETAILED QUESTIONS

Q11.1: How does genital tuberculosis most commonly spread to the reproductive organs?

Answer: M/c route of spread: Hematogenous

- After tubal involvement, spread to endometrium by direct spread.
  - Cornual end of uterus typically involved

Q11.2: What is the most common clinical presentation of Genital TB?

Answer: Infertility > Menstrual complaints

Q11.3: What are the earliest and most common menstrual complains of genital TB?

Answer: Menstrual complains in genital TB:

- **Earliest: Menorrhagia** (endometrium involvement in acute infective stage)
- Most common: Amenorrhea/hypomenorrhea

Q11.4: What is the most common pelvic examination finding?

Answer: Normal (no abnormal finding)

Q11.5: How is Gential TB diagnosed?

Answer: Granulomas are detected on AFB staining, Culture, PCR, or Histopathological examination (HPE).

- Endometrial biopsy/sampling/aspiration ideally done premenstrually
- Diagnosis of TB made in particular clinical context

Q11.6: What is the treatment of genital TB?

Answer: Category 1 ATT

BIG QUESTION 12: What are the pathology, clinical manifestations, methods of diagnosis, and management of endometriosis?

Broad Answer: Estrogen dependent condition with genetic predisposition **Kras mutation.**

- Endometriosis is a condition in which endometrial tissue grows outside the uterus, commonly affecting the ovaries, fallopian tubes, and pelvic peritoneum, leading to chronic pelvic pain, dysmenorrhea, dyspareunia, and infertility.

DETAILED QUESTIONS

Q12.1: What is the most common site of endometriosis?

Answer: Ovary > POD> Uterosacral

Q12.2: What is the most common theory of endometriosis?

Answer: **Sampsons theory of retrograde menstruation and implantation.**

- Scar site endometriosis: Episiotomy scar site/Abdominal incision site → Explained by direct implantation theory.

Q12.3: What is the most common extragenital site of endometriosi?

Answer: Sigmoid colon

Q12.4: Are Mullerian anomalies associated with endometriosis?

Answer: Endometriosis is more common in woman with **Mullerian anomalies**, particularly in outflow tract obstruction → Transverse vaginal septum

Q12.5: What is the most common clinical presentation of endometriosis?

Answer: Pelvic pain

- Severity of pain depends on location of deposits and depth of implants.
- No septic seeding of implants.

Q12.6: What is the most common age of presentation of endometriosis?

Answer: The usual age of presentation is 25-35 years (more common in nulliparous women).

Q12.7: What is the triad of endometriosis?

Answer: Classic Triad:

- Dysmenorrhea
- Dyspareunia
- Infertility

Q12.8: What are pelvic examination findings in endometriosis?

Answer: Pelvic examination findings:

- Can be normal (small superficial deposits)
- Adnexal mass
- Tender nodularity in POD → **Cobblestone feel** of uterosacral on clinical examination.

Q12.9: How is endometriosis diagnosed?

Answer: Clinical profile supported by USG makes the diagnosis

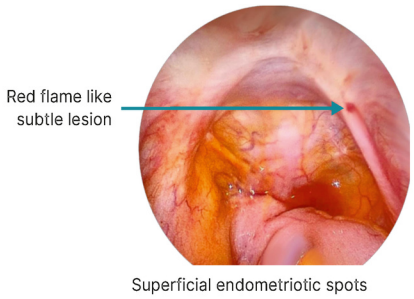
- Ground glass appearance of endometriosis cyst → **Endometrioma**
- Hysterosalpingography - tubal patency test done for infertility workup of patients.



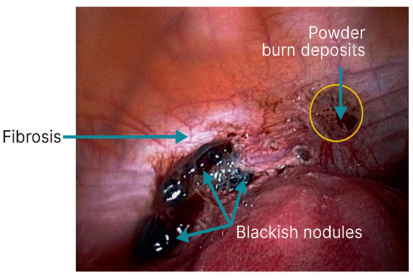
USG

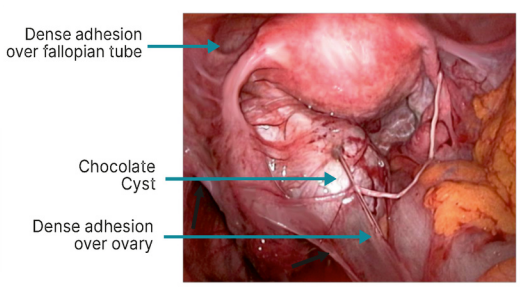
Q12.10: What is the gold standard investigation for endometriosis?

Answer: Laparoscopy, preferably with HPE confirmation (not always mandatory).



Superficial endometriotic spots





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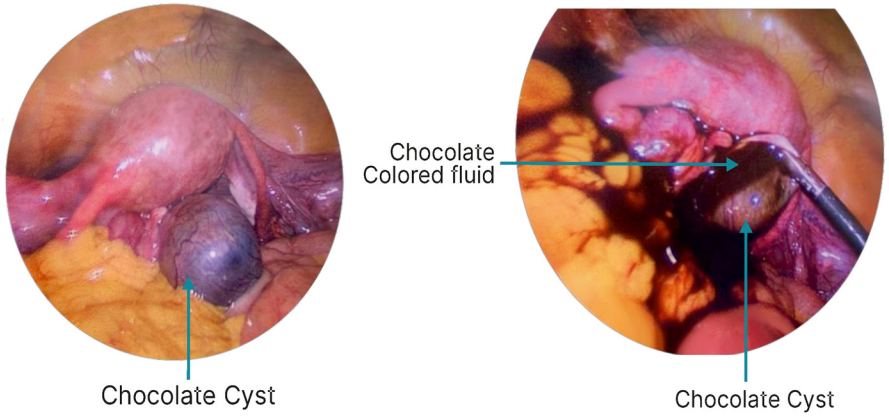
Q12.11: How does endometriosis lead to infertility?

Answer: Reasons for infertility:

- Distorted tubo-ovarian anatomy
  - Inside of tube is not anatomically blocked but function distorted, kinking of tube from outside.
- Defective follicular development (due to release of inflammatory mediators)
  - Can have anovulatory cycles
- Interference with fertilization
  - Inflammatory fluid can enter inside fallopian tube
- Impaired endometrial receptivity

Q12.12: What is the laparoscopic appearance of endometrioma?

Answer: **Chocolate cyst** (old collected blood)



Q12.13: When is cystectomy indicated in the management?

Answer: When case is symptomatic and/or large in size ≥ 4 cm.

- Cystectomy leads to least risk or recurrence.

Q12.14: What is the prevalence of endometriosis in unexplained infertility?

Answer: About 40-50%

Q12.15: What is the management of endometriosis associated infertility?

Answer: Management:

- **Minimal/mild disease:** Ovulation induction + IUI → Fails → IVF
- **Moderate to severe disease:** IVF (best) or surgical adhesiolysis can be done and then proceed with IVF.

Q12.16: Which drugs are used in the medical management of pain in endometrios?

Answer: Drugs are:

- NSAIDs
- OCPs **(1st line)**
- Progesterone **(1st line)**
  - Dienogest 2mg/day
- GnRH analogues **(2nd line)**
- Aromatase inhibitors
- Gestrinone and Danazol
  - **Generally not preferred** (androgenic side effects).

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- GnRH antagonists **(recently approved and available in oral form)**
  - o Elagolix
  - o Relugolix
- Mifepristone **(not approved)**

Q12.17: A 25-year-old unmarried woman complains of severe dysmenorrhea for the past 2 years that has been gradually progressive. The pain typically begins a few days before menstruation and persists throughout the menses. She also complains of painful intercourse. On pelvic examination, the uterus is normal size, but there is bilateral adnexal tenderness. What is the next step in management?

Answer: TVS (transvaginal scan)

BIG QUESTION 13: What is infertility, and what are its causes, methods of diagnosis, and management?

Broad Answer: Inability to conceive after 1 year of regular unprotected intercourse.

- Evaluation may be initiated earlier—within 6 months of attempting conception—if risk factors are present, such as irregular menstrual cycles, a known history of PCOS, multiple prior episodes of PID, a history of ectopic pregnancy, previous chemotherapy or radiotherapy, or if the woman is over 35 years of age.

DETAILED QUESTIONS

Q13.1: What is fecundability?

Answer: Probability of achieving pregnancy within 1 menstrual cycle → Probability is about 20% → Chances become better with repeated trying.

Q13.2: What does the basic evaluation of infertility involve?

Answer: Basic infertility workup includes:

- Test for ovulation
  - o Needed if a woman has regular cycles and is not sure if she is ovulating
  - o If not ovulating, → Evaluation of cause
  - o Irregular cycles → Anovulation → Evaluation of cause
- Tubal patency test
- TVS (transvaginal scan)
- Husband semen analysis
- Evaluation of both partners starts together

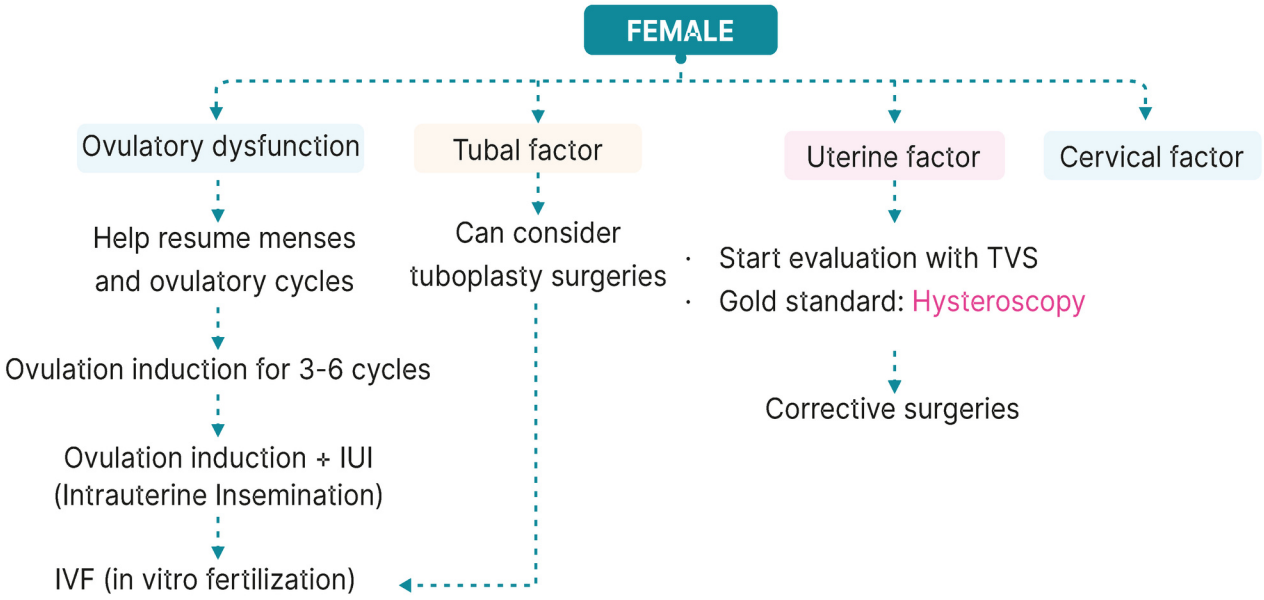
Q13.3: What is the epidemiology of causes of infertility?

Answer: Epidemiology of causes of infertility:

- Female cause: 40-50% cases
- Male cause of contributing to infertility: 40% cases
- Male only reason of infertility: 20% cases
- Unexplained infertility: 10% cases

Q13.4: What is the clinical approach to evaluating female infertility?

Answer: Approach:



Q13.5: What are the uterine factors for infertility?

Answer: Uterine factors:

- Asherman syndrome
- Submucous fibroid
- Septate uterus

Q13.6: What are the cervical factors for infertility?

Answer: Antisperm antibody

- Earlier postcoital test were done, not done nowadays.

Q13.7 What are the characteristics of unexplained infertility?

Answer: Unexplained infertility:

- Husband's semen analysis is normal
- Ovulation documented
- **Atleast 1 tube patent**
- TVS normal

Q13.8: What is the best treatment for tubal factor and unexplained infertility?

Answer: IVF

- Generally, initial treatment done (ovulation induction + IUI) → Does not work → Proceed with IVF
- Unexplained infertility and endometriosis associated with infertility → Managed along similar lines
- IUI always combined with ovulation to get best outcome

BIG QUESTION 14: What are the tests for documenting ovulation in clinical practice?

Broad Answer: Tests are:

- Serum progesterone
- Endometrial sampling
- To time intercourse

- Urinary LH testing
- Follicular monitoring

- Other ways are:
  - Basal body temperature
  - Cervical mucus changes
  - Vaginal cytology

DETAILED QUESTIONS

Q14.1: When is serum progesterone and endometrial testing done?

Answer: Both are done on: D21 (day 21) of cycle (regular 28 days cycle) → Called 1 week prior to expected menses (premenstrual).

- Serum progesterone: Levels **>3 ng/ml** : Suggests ovulation
- Endometrial sampling: Secretory changes means progesteron is there: Suggests ovulation.

Q14.2: Which tests are used to determine the optimal timing of intercourse in infertility?

Answer: The tests to time intercourse:

- **Urinary LH Testing:**
  - Kit-based testing
  - Utility is in timed intercourse
  - Greatest fertility on day of LH surge in urine and next 2 days
- **Follicular Monitoring on TVS**
  - It is usually done along with ovulation induction.

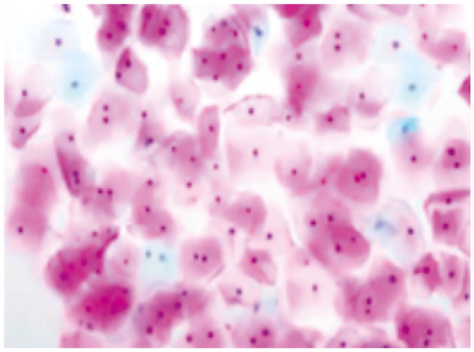
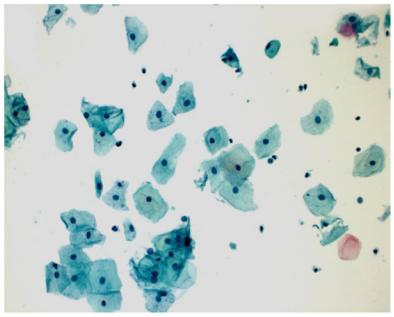
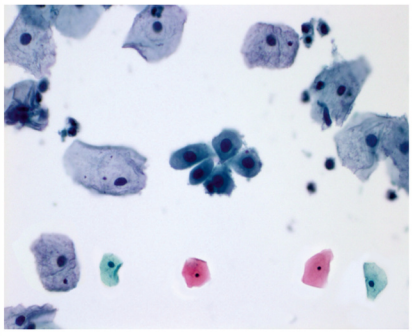
Q14.3: What are the other ways of documenting ovulation?

Answer: Other ways are:

- **Basal body temperature:** Biphasic temperature → Progesterone is a thermogenic hormone.
  - In 2nd half of cycle, basal body temperature rises.
- **Cervical mucus changes:** Taught to appreciate mucus changes according to estrogen and progesterone.
- **Vaginal cytology:** Sample taken from upper lateral wall of fornix → Tells about hormonal status of woman.

BIG QUESTION 15: What are the types of vaginal epithelial cells, and their significance?

Broad Answer: They are:

Superficial cells	Intermediate cells	Basal cells
Pink colour cells with small pyknotic nuclei. Predominant on estrogen exposure.	Progesterone exposure of vaginal mucosal cells.	Predominant when no hormone exposure.
		

DETAILED QUESTIONS:

Q15.1: What is the Karyotypic index?

Answer: **Karyotypic index (Cornification index):**

Number of superficial cells / (No. of intermediate cells + No. of basal cells)

- Percentage of superficial cells/cornified cells checked
- Maximum around the **time of ovulation** → Estrogen peak

Q15.2: What is the Maturation index?

Answer: **Maturation index:** It is the ratio of (around the time of ovulation):

- Parabasal: Intermediate: Superficial cells = 0: 30: 70 (shift to right)

Q15.3: Which of the following findings is suggestive that recent ovulation has taken place?

A. Pseudo-stratification of the endometrium on HPE
B. Spinnbarkeit phenomenon in cervical mucus
C. Shrinkage of dominant follicle and free fluid in POD
D. Trilaminar endometrium on TVS

Answer: C. Shrinkage of dominant follicle and free fluid in POD

- Pseudo-stratification of the endometrium on HPE: Proliferative change, not a secretory change
- Spinnbarkeit phenomenon in cervical mucus: Tells about estrogen influence not ovulation.
- Trilaminar endometrium on TVS: Estrogen related change in endometrium

Q15.4: How is ovulation related to the dominant follicle?

Answer: They are related as:

- Dominant follicle grows at a **rate of ~2 mm per day.**
- Repeated ultrasounds (follicular monitoring) are done to track follicular growth.
- Ovulation induction drugs are usually given early in the cycle for 5 days.
- Response to the medication is assessed by monitoring the growth of the dominant follicle.
- A follicle size of **18-20 mm** indicates it is likely to ovulate soon.
- Post-ovulation: The dominant follicle shrinks, and free fluid in the pouch of Douglas (POD) may be observed, confirming ovulation.

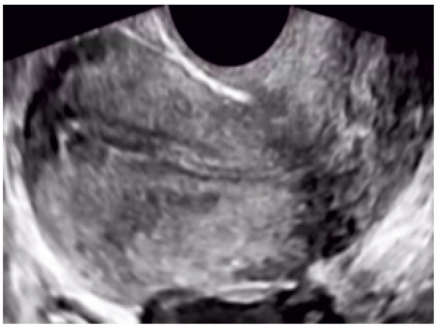
Q15.5: How does hCG injection trigger ovulation?

Answer: It acts like LH.

Q15.6: What is the sonographic appearance of the endometrium in the periovulatory and secretory phases?

Answer: The USG images are:

- Periovulatory endometrium/**Triple line endometrium**



Secretory endometrium

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- Secretory endometrium: Thick and hyperechoic endometrium


Periovulatory endometrium

BIG QUESTION 16: What are the examples, pharmacology, and clinical uses of drugs used for ovulation induction?

Broad Answer: The drugs used to induce ovulation are:

- 1st line drugs: Letrozele > Clomiphene citrate
- 2nd line drugs: Gonadotopins (injectables)
  - Human menopausal gonadotropins
  - Recombinant FSH
  - Recombinant LH

DETAILED QUESTIONS

Q16.1: What is the half-life, dose, and side effects of clomiphene citrate?

Answer: Clomiphene citrate:

- Oral drug
- Anti-estrogenic action responsible for ovulation induction effect
- **Half-life: 2 weeks**
- Dose: 50-100mg OD for initial 5 days of cycle
- **Side effects:** Vasomotor symptoms (most common), breast discomfort, ovarian cyst formation
  - If visual disturbances seen, stop treatment.

Q16.2: What is the dose, half-life and class of letrozole?

Answer: Letrozole:

- **Aromatase inhibitor**
- Half-life: 45 hours
- Dose: 2.5-7.5mg OD
- Leads to monofollicular development

Q16.3: Which form of GnRH analogues are used in PCOS?

Answer: Pulsatile form → Pulsatile Leuprolide

Q16.4: What is the use of dopamine agonist in PCOS?

Answer: Ovulation induction in hyperprolactinemia cases.

Q16.5: What is the first-line treatment for hypogonadotropic hypogonadism?

Answer: Gonadotropins - 1st line and pulsatile GnRH can be used

- Both Clomiphene and Letrozole stimulate FSH release from pituitary, not effective in hypogonadotropic hypogonadism.
- With anterior pituitary necrosis/ablation → Ovulation induction → Gonadotropins

Q16.6: What is the rate of multiple pregnancy in Clomiphene, Letrozole and Gonadotropins?

Answer: Rate of multiple pregnancy in:

- Clomiphene citrate: 7-10%
  - o Letrozole: Comparable and similar
- Gonadotropin: 15-30%

BIG QUESTION 17: What are the ovarian reserve tests, and what is their clinical significance?

Broad Answer: Ovarian reserve tests:

- D3 serum inhibin
- D3 serum FSH
- D3 serum Estradiol
- D3 Antral count
- Serum AMH **(best test)**

DETAILED QUESTIONS

Q17.1: How do serum inhibin levels on day 3 affect fertility evaluation?

Answer: D3 serum **inhibin levels decrease** (inhibin B from granulosa cells)

Q17.2: How is poor ovarian reserve reflected in day 3 FSH, estradiol, antral follicle count, and serum AMH levels?

Answer: Poor ovarian reserve is indicated by:

- D3 serum FSH >10 IU/L
- D3 serum Estradiol >60-80 pg/ml (high initially)
- D3 Antral count <4 (combined antral follicular count in both the ovaries)
- Serum AMH <0.5 to 1 ng/ml

Q17.3: What are the indications for performing ovarian reserve testing?

Answer: Indications:

- Age >35 years
- Smoker
- H/o premature ovarian insufficiency in family
- H/o pelvic radiotherapy, chemotherapy, ovarian surgery in the past

Q17.4: What is the source of Anti-Müllerian Hormone (AMH)?

Answer: Secreted from grabulosa cells of preantral and smaller antral follicles.

Q17.5: When should serum AMH be tested?

Answer: It can be done anytime during the cycle.

- Levels are gonadotropin independent

BIG QUESTION 18: What are the tubal patency tests?

Broad Answer: Tubal patency tests:

- Hysterosalpingography
- Sonosalpingography (screening test)

DETAILED QUESTIONS

Q18.1: What is hysterosalpingography (HSG)?

Answer: Dye is introduced into the uterine cavity, and an X-ray film is taken.

- Dye travels in uterine cavity → fills it up → fills fallopian tubes → comes out of the fimbrial end → free spill of dye from fimbrial end of fallopian tube.

Q18.2: What does a normal HSG film suggest about fallopian tube patency?

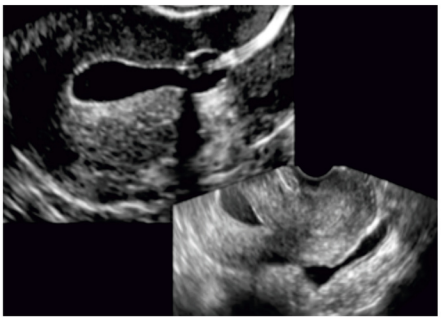
Answer: Normal HSG film shows tubes are patent.



Q18.3: What is the procedure for sonosalpingography in evaluating fallopian tube patency?

Answer: Sonosalpingography:

- Bulb of Foley's catheter introduced inside, inflated and kept in place.
- Saline pushed inside → Eventually comes out of fallopian tube → Fill in pouch of Douglas **(tubes are open)**.
- **Both tubes are blocked** → Saline does not come out at all.



Q18.4: What are the disadvantages of sonosalpingography?

Answer: Disadvantages:

- Fluid comes out → Can't tell which tube is blocked
- Gives no information about tubal anatomy

In clinical practice, mainly HSG is done.

Q18.5: When should a tubal patency test be performed?

Answer: **Timing: Postmenopausal (follicular/proliferative)** → To prevent accidental disturbing of pregnancy

- Done anytime D6-D11
- Mostly done on D10

Q18.6: Which cannula is used in the Tubal patency test?

Answer: Leech Wilkinson cannula



Q18.7: What are the contraindications of tubal patency tests?

Answer: Contraindications are:

- Genital tuberculosis (aggravates and flare up infection)
- Active genital infections (spread ascending infections)

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- Bleeding
- Dye allergy (HSG not done)
  - o Laparoscopic chromopertubation can be done

Q18.8: What is gold standard investigation for tubal evaluation?

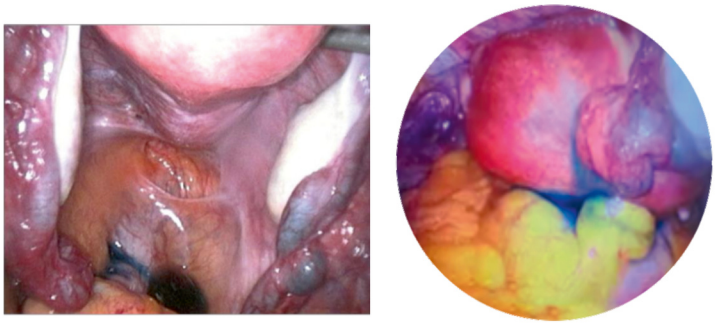
Answer: Laparoscopic chromopertubation (coloured dye → travelling via tube → laparoscopy).

- It is the confirmatory test for tubal patency.
- Methylen blue and indigo carmine dye can also be used.

Q18.9: What is the use of laparoscopic chromotpertubation in tubal patency?

Answer: Tells about condition of tube, pelvis, patency of tube.

Q18.10: What does the given image indicate?



Answer: Laparoscopic chromopertubation

- Blue coloured dye travelling in fallopian tubes and collecting in pelvis.

BIG QUESTION 19: What are the different radiographic appearances of fallopian tubes on HSG?

Broad Answer: On hysterosalpingography (HSG), normal fallopian tubes appear as smooth, patent, and contrast-filled structures, while abnormalities can include blockage, dilatation (hydrosalpinx), strictures, or irregular contours indicating adhesions or prior infection. These findings help assess tubal patency and guide infertility management.

DETAILED QUESTIONS

Q19.1: What is the appearance of Bilateral cornual block on HSG?

Answer:

Fallopian Tube Appearance	HSG image
B/L Cornual Block • Only cavity is filled with dye • No dye has entered fallopian tube	

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Q19.2: How does Bilateral distal block appear on HSG?

Answer:

B/L Distal Tube Block • Dye goes in the fallopian tube but in the distal end → Collecting in a pouch.	

Q19.3: What are lead pipe tubes?

Answer:

Lead Pipe Tubes • Uterine cavity distorted	

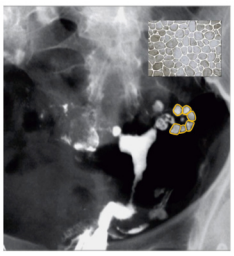
Q19.4: Where is the 'tobacco pouch' appearance seen?

Answer:

Tobacco Pouch Appearance • Typical findings seen in Genital TB, chronic PID.	

Q19.5: What are some other important HSG findings seen in genital TB?

Answer:

Beaded tube	
Cobblestone appearance	

Q19.6: What is golf club appearance?

Answer:

Golf Club appearance • Typical for genital TB	

Q19.7: What are the differential diagnosis of B/L cornual block on HSG?

Answer: D/d:

- Cornual spasm
- Faulty catheter placement
- U/L cornual block (pushing dye to only 1 side)
- True block
- Genital TB (true B/L cornual block)

Q19.8: What is the next step in B/L cornual block after HSG?

Answer: Laparoscopic chromopertubation (preferably with hysteroscopy)

Q19.9: What is the next step in B/L cornual block if true block is confirmed?

Answer: Attempt hysteroscopic cannulation

Q19.10: What is the shape of tubes in B/L distal tubal block on HSG?

Answer: Retort shaped



Q19.11: What is the most likely cause of B/L Distal tube block on HSG?

Answer: Hydrosalpinx

Q19.12: What is the next step in B/L distal tube block after HSG?

Answer: Laparoscopic chromopertubation (preferably with hysteroscopy)

- Laparoscopy + hysteroscopy > Laparoscopic chromopertubation
- Done with hysteroscopy as infertility patients can have simultaneous evaluation of pelvis uterine cavity, and track for trubal patency.

Q19.13: What are the findings in HSG of Lead Pipe tubes?

Answer: **Findings:**

- Distorted uterine cavity
- Filing defects inside cavity (maybe Asherman syndrome)
- Rigid tubes

Q19.14: A 28-year-old woman being evaluated for infertility has come with her HSG report as shown. She has regular cycles with scanty flow over the past 1 year. Her pelvic exam is normal and husband semen analysis is normal. What would be preferred next step in management?



Answer: Laparasoscopy and hysteroscopy

- B/L cornual block
- Filling defect inside the uterine cavity → can be Asherman syndrome

Q19.15: A young couple is being evaluated for infertility. They have been trying to conceive for the past 3 years. The husband's semen analysis is normal. The woman is 28 years old, obese with irregular menstrual cycles. There is h/o PID in the past. The pelvic exam is normal. What would you like to do next?

Answer: Perform HSG

- Irregular cycles → Cannot time the D21 serum progesterone levels
- Diagnostic laparoscopy: Expensive and invasive
- Before IUI → Always important to document tubal patency, atleast one tube should be patent.

BIG QUESTION 20: What are the causes, diagnosis, features and management of male factor infertility?

Broad Answer: Male factor infertility results from abnormalities in sperm production, function, or delivery, caused by conditions such as varicocele, infections, hormonal disorders, or genetic defects. Diagnosis involves semen analysis, hormonal and genetic testing, while management includes medical therapy, surgical correction, or assisted reproductive techniques.

DETAILED QUESTIONS

Q20.1: What is the ideal time to perform semen analysis?

Answer:

- Done after 3 days of abstinence and sample is examined within 60 minutes of collection (done in a sterile container) → Tends to liquefy in 30-60 minutes.

Q20.2: What are the WHO 2021 lower reference limits for semen analysis parameters?

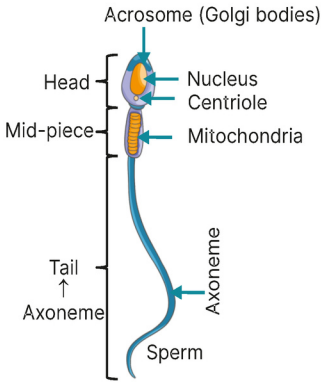
Answer: Lower reference values are:

- Semen volume >1.4 ml
- pH >7.2
- Count >39 million per ejaculate
- Sperm concentration > 16 million/ml
- Total motility > 42%
- Progressive motility >30%
- Normal morphology >4%
- Vitality > 54%
- WBC < 5 million/ml

Q20.3: What is the most important criteria in semen analysis?

Answer: Morphology > motility > concentration

- **Morphology:**
  - Tells about the capacity of sperm to fertilize
  - Tail has (9+2) arrangement of microtubule fibres
  - RER (rough endoplasmic reticulum) is absent



Q20.4: What are the criteria for assessing sperm morphology in semen analysis?

Answer: Strict criteria/Kruger Tygerberg criteria

Q20.5: What is the size of ova and sperm?

Answer: The size of:

- **Sperm:** 55 microns
- **Ova:** 120 microns

Q20.6: What are the abnormal semen parameters?

Answer: Abnormal semen parameters:

Semen Parameter	Description
Aspermia	Absence of semen
Azoospermia	Absence of sperm in semen
Oligospermia	Low sperm concetration (<60 million/ml) • Severe oligospermia: Concetration < 5 million/ml
Asthenospermia	Low motility
Teratospermia	Abnormal morphology
Necrospermia	Dead sperm in semen
Globospermia	Round sperms (loss of acrosomal cap) in semen

Q20.7: Sperms gain motility in which structure?

Answer: Epididymis

Q20.8: Which ion is responsible for sperm motility?

Answer: Calcium ion

Q20.9: Which gene is responsible for sperm motility?

Answer: Catsper gene

Q20.10: Where in the body does sperm capacitation take place?

Answer: Female genital tract → Begins in cervix and occurs mainly in fallopian tubes and takes about 7 hours.

- **Capacitation:** Sperms gain hypermotility, capacity to fertilize.

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Q20.11: What are the tests to differentiate obstructive and non-obstructive azoospermia?

Answer: Full hormonal profile:

- Serum FSH **(best)**
- Serum LH
- Serum Testosterone
- Serum Prolactin
- Serum Thyroid

Q20.12: What is the most common cause of azoospermia?

Answer: Primary gonadal failure (high FSH and low testosterone)

Q20.13: What are the causes of azoospermia?

Answer: Causes of azoospermia:

- **Klinefelter's syndrome (47+XXY)**
  - Under virilized male, gynecomastia with small atrophic testes.
- Y chromosome microdeletions **(Yq11-AZF: Azoospermia Factor)**
  - Transmitted to male offsprings
- Others:
  - Trauma
  - Radiation
  - Mumps
  - Orchitis
  - Cryptorchidism

Q20.14: What is the least common cause of male infertility?

Answer: Secondary gonadal failure: Pituitary/hypothalamic cause

- Low FSH and testosterone

Q20.15: What is Obstructive Azoospermia?

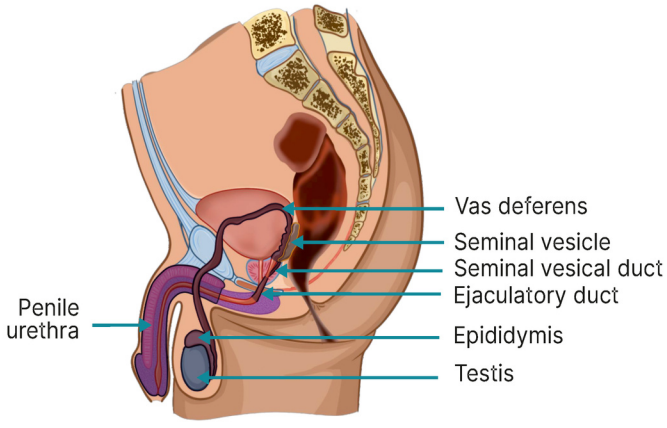
Answer: Normal FSH and testosterone levels

- Acquired causes: TB, Gonorrhea, Chlamydia
- Post-surgical: H/o hernia repair, varicocele repair, accidental damage to vas deferens during surgery.
- Congenital B/L absence of vas deferens: **CBAVD**
- Obstruction suspected along the vas deferens, epididymis → for evaluation → scrotal ultrasound done.

Q20.16: How do you interpret and evaluate azoospermia associated with low volume, absent fructose, acidic pH, and normal hormones?

Answer: It is evaluated as:

- Clinical examination → Ultrasound (transrectal, scrotal)
- Low volume ejaculate + absent fructose → Affected seminal vesicle
- Normal hormone azoospermia → Obstructive case



Q20.17: What are the possibilities in azoospermia associated with low volume, absent fructose, acidic pH, and normal hormones?

Answer: Possibilities are:

1st Possibility	• Inability to palpate the vas deferens • Seminal vesicles absent → Low volume ejaculate and absence of fructose → CBAVD • Also check for CFTR mutation and Renal imaging (10-25% men have renal agenesis also)
2nd Possibility	Epididymal fullness, seminal vesicles dilated on per rectal examination or on transrectal ultrasound → Obstruction is at level of ejaculatory duct
Another possibility (ruling out both the above possibilities)	Retrograde ejaculation → checked by post ejaculatory urine analysis → if sperms present → confirms retrograde ejaculation.

Q20.18: How to manage mild semen abnormalities?

Answer: Intrauterine insemination (an option for impotency and ejaculatory disorders).

Q20.19: How to manage severe oligospermia/azoospermia?

Answer: Surgically extract the sperm → IVF with ICSI

- ICSI is done as surgically extracted sperm are immotile or have low motility.
- Donor sperm IUI is also an option with primary testicular failure (low chances of surgically retrieving sperms).

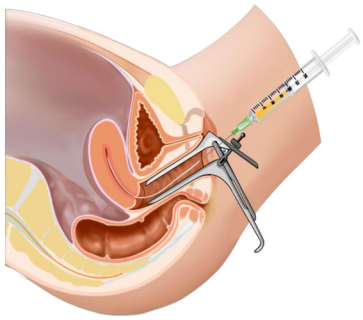
Q20.20: What are the indications for Intracytoplasmic Sperm Injection (ICSI)?

Answer: Indications are:

- Concentration <5 million/ml
- Motility <5%
- Normal morphological forms are <4%

BIG QUESTION 21: What are the types, features, and indications of Assisted Reproductive Technology (ART)

Broad Answer: Assisted Reproductive Technology (ART) includes medical techniques like IVF and ICSI used to treat infertility, indicated in cases of male or female factor infertility, tubal block, or unexplained infertility.



DETAILED QUESTIONS

Q21.1: Is Intrauterine Insemination (IUI) classified as ART?

Answer: It is not classified as an ART (Assisted Reproductive Technique).

Q21.2: How much semen sample is used to perform IUI?

Answer: 0.5 ml or prepped semen sample.

Q21.3: What are the semen preparation methods for IUI?

Answer: Semen preparation methods?

Method	Description
Swim up method	Simple method based on centrifugation, can be used in IUI also
Density gradient method	Performing better but are expensive and generally used in IVF cases.
Glass wool filtration	

Q21.4: When is semen prepartion done for IUI?

Answer: On same day as IUI is planned.

Q21.5: What should be done if the husband is unavailable or wishes to provide the semen sample in advance for IUI?

Answer: Cryopreservation of semen under liquid nitrogen at low temperature.

Q21.6: When is the ideal time to perform IUI?

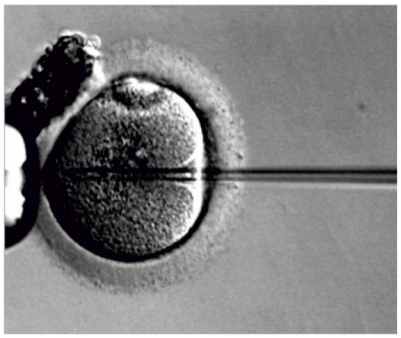
Answer: Timing of IUI:

- **On day of ovulation:** 36 hours after ovulation trigger
- **LH surge detection:** Day after LH surge is detected in urine

Q21.7: What type of needle is used in Intracytoplasmic Sperm Injection (ICSI)?

Answer: Thin needle (as thin a strand of hair).

- Oocyte inside zona pellucida and polar body seen



Q21.8: What happens when conventional IVF fails?

Answer: ICSI is performed when conventional IVF fails (sperm and oocyte kept in culture medium and fertilization managed by sperm itself).

Q21.9: What is IVF (In Vitro Fertilization)?

Answer: IVF (In Vitro Fertilization):

- Fertilization and embryo culture in lab
- In the culture medium, processes like capacitation and the acrosomal reaction are recreated in the lab.
- However, in conventional IVF, the sperm must independently penetrate the egg without assistance.

Q21.10: What are the indications for ICSI?

Answer: Indications:

- Conventional IVF fails
- Severe male factor
- Surgically retrieved sperms

BIG QUESTION 22: What is the pathogenesis OHSS (ovarian hyperstimulation syndrome)?

Broad Answer: A potentially life threatening condition.

Increased vascular permeability as when follicles stimulated

↓

Ovarian stroma also gets stimulated

↓

Inflammatory mediators released (like VEGF)

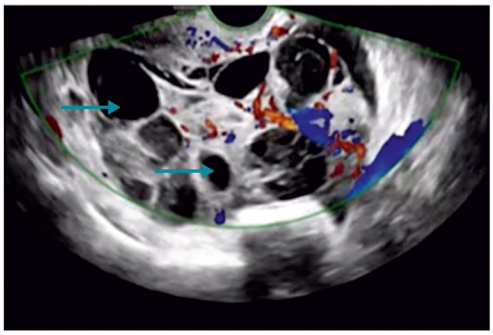
↓

Increased vascular permeability

Systemic circulation

↓

Endothelial damage



Ovarian stroma and ↑ vascularity

DETAILED QUESTIONS

Q22.1: What conditions or treatments lead to OHSS?

Answer: Women receiving gonadotropin injections for IVF (ovulation induction).

Q22.2: What is the risk percentage of OHSS with gonadotropins and Clomiphene citrate?

Answer: Risk percentage:

- Gonadotropins: ~ 15%
- Clomiphene citrate: ~ 1%

Q22.3: What is the usual timing of onset for OHSS?

Answer: 3-4 days after giving HCG trigger (early onset OHSS)

- It can happen 12-17 days after trigger, later when she conceives → hCG from pregnancy stimulates ovarian stroma.

Q22.4: What are the clinical manifestations of OHSS?

Answer: Clinical manifestations:

- Abdominal pain, Nausea and vomiting
- Hypovolemia, Hypotension
- Risk of ascites, Pulmonary edema
- Venous thromboembolism
- Acute renal failure

Q22.5: What is the management of OHSS?

Answer: Management:

- Conservative
- IV fluids
- IV albumin
- Venous thromboembolism prophylaxis

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6. ADNEXAL MASS AND GYNE CANCERS

BIG QUESTION 1: What are the causes of adnexal masses in reproductive-age women?

Broad Answer: Adnexal masses in reproductive-age women are usually benign and result from physiological, inflammatory, or neoplastic processes. Proper evaluation is essential to differentiate benign from malignant causes and guide management.

DETAILED QUESTIONS

Q1.1: What are the common differential diagnoses of adnexal masses?

Answer:

Category	Examples
Functional Cysts	Follicular cyst (most common), Corpus luteal cyst (most likely to rupture)
Hormonal Cysts	Theca lutein cysts (seen in GTN, molar pregnancy, diabetes, Rh-isoimmunization)
Inflammatory	Tubo-ovarian abscess, Chronic PID, Hydrosalpinx
Endometriotic	Endometrial cysts
Tumors (Benign)	Dermoid cyst (most common benign tumor), other ovarian tumors
Tubal/Ectopic Pregnancy	Tubal mass, Ectopic pregnancy

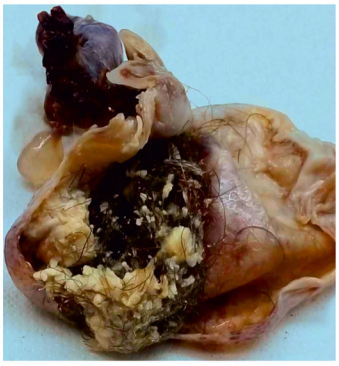
BIG QUESTION 2: What are the clinical and imaging features of dermoid cysts?

Broad Answer: Dermoid cysts (mature cystic teratomas) are common benign ovarian tumors in young women. They can undergo torsion or rupture and may rarely become malignant.

DETAILED QUESTIONS

Q2.1: What are the key clinical and pathological features of dermoid cysts?

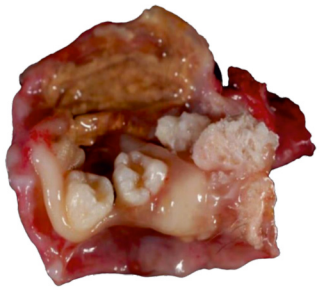
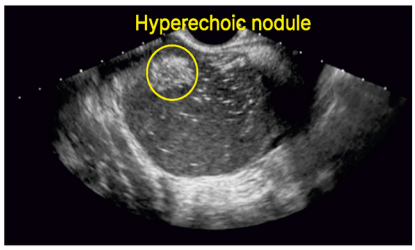
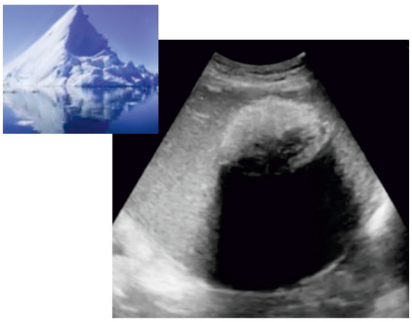
Answer:



- Most common ovarian tumor in 2nd and 3rd decade of life
- Commonly detected during pregnancy
- Bilateral in up to 10% of cases
- Most frequent tumor to undergo torsion (15%)
- Lined by stratified squamous epithelium
- Rare malignant transformation (2%, usually SCC in postmenopausal women)
- Treatment: Cystectomy, preferably via laparoscopy
- Rupture can lead to chemical peritonitis

Q2.2: What are the characteristic ultrasound features of dermoid cysts?

Answer:

Sign	Description
Rokitansky protuberance	Echogenic mural nodule seen on USG or grossly 
Dash and dot appearance	Hyperechoic dots and lines due to hair strands 
Tip of the iceberg sign	Dense material causes posterior acoustic shadowing  Rokitansky protuberance

BIG QUESTION 3: How do we clinically approach an adnexal mass?

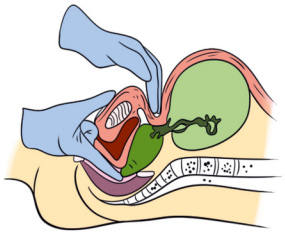
Broad Answer: The clinical approach to an adnexal mass involves evaluating patient demographics, symptoms, physical exam findings, and imaging features to differentiate likely benign from potentially malignant masses.

DETAILED QUESTIONS

Q3.1: What features suggest a likely benign vs malignant adnexal mass?

Answer:

Parameter	Likely Benign	Likely Malignant
Age	Reproductive age	Pre-menarchal, adolescent, or postmenopausal
Symptoms	Related to context	Usually painless initially

Physical Exam 	U/L, cystic, smooth, mobile	B/L, firm-hard, solid, irregular, restricted mobility
Cervical Motion	Moves with cervix	Restricted
Inflammatory Mass	Tenderness, restricted mobility	–

Q3.2: What is the first-line imaging modality in evaluating adnexal mass?

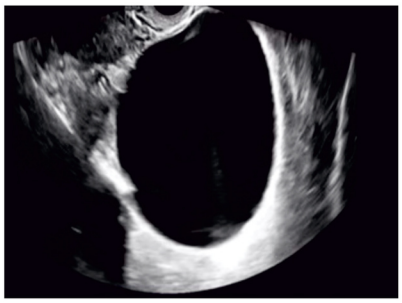
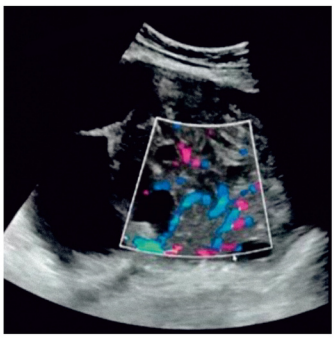
Answer:

Transvaginal sonography (TVS) is the initial investigation of choice. It helps to:

- Locate the mass
- Categorize the mass

Q3.3: What ultrasound features suggest benign vs malignant nature?

Answer:

Benign Features	Suspicious/Malignant Features
	
Simple, unilocular, anechoic	Bilaterality, multilocularity, thick septations
Posterior acoustic shadowing	Solid areas
-	Increased blood flow inside the mass
-	Ascites, metastasis, enlarged lymph nodes

Q3.4: What confirms the diagnosis of malignancy?

Answer: Histopathological examination of the excised mass.

Q3.5: When is surgical management indicated for adnexal masses?

Answer:

- Size > 8 cm
- Suspicion of malignancy on USG
- Acute abdomen/torsion (irrespective of size)
- Always evaluate tumor markers before surgery

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Q3.6: What tumor marker is used in suspected epithelial ovarian cancer?
Answer: CA-125

- Normal: < 35 IU/L
- More specific in postmenopausal women
- In reproductive age, CA-125 is less specific

Q3.7: What are benign causes of raised CA-125?
Answer:

- Endometriosis
- PID
- Fibroids
- Adenomyosis
- Genital tuberculosis

Q3.8: What if CA-125 > 200 IU/L in a young woman?
Answer: Refer to a gynecologic oncologist.

Q3.9: When should an adnexal mass be operated during pregnancy?
Answer:

- Indications: Same as non-pregnant
- Timing: 14-16 weeks
- High-risk periods for torsion:
  - Transition from 1st to 2nd trimester
  - Puerperium
  - During labor (if obstructing presenting part)

Q3.10: When can a postmenopausal adnexal mass be safely observed?
Answer: Only if all criteria are met:

- Asymptomatic
- Unilateral
- Simple cyst
- Size < 5 cm
- Normal CA-125

If any of these are abnormal → Surgical evaluation is indicated.

BIG QUESTION 4: How are clinical scenarios involving adnexal masses evaluated?

Broad Answer: Several clinical case presentations help in understanding the diagnostic reasoning and management steps for adnexal masses, especially in young women, reproductive-age females, and emergencies.

DETAILED QUESTIONS

Q4.1: A 26-year-old woman with primary infertility has bilateral ovarian masses, regular cycles, severe dysmenorrhea, dyspareunia, and CA-125 of 90 IU/L. What is the likely diagnosis?
Answer: Endometriosis
Explanation:

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- Classic triad: Infertility + Congestive dysmenorrhea + Dyspareunia
- Genital TB rarely causes bilateral adnexal masses
- Dysgerminoma: Malignant germ cell tumor → raised LDH, not CA-125
- CA-125 not specific in reproductive-age group

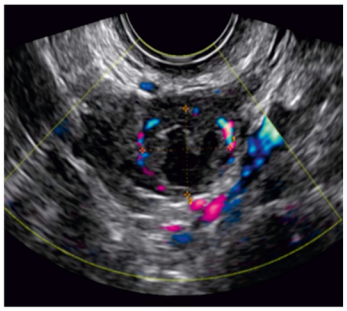
Q4.2: A 20-year-old girl with regular periods and no dysmenorrhea has a 5 cm simple right ovarian cyst. What is the next best step?

Answer: Follow-up after 3 months

Explanation:

- Most likely a follicular cyst
- OCPs prevent new cysts, don't treat existing ones
- No indication for laparoscopy or tumor markers
- Asymptomatic + simple cyst → observation

Q4.3: A 23-year-old presents with sudden left-sided abdominal pain, 17 days post LMP. USG shows 4 cm cystic lesion with internal echoes and POD fluid. Likely diagnosis?

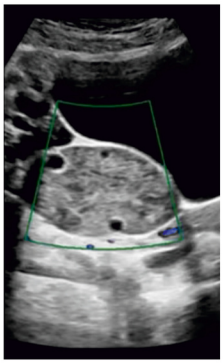


Answer: Corpus luteal cyst

Explanation:

- Hemorrhagic corpus luteal cyst: Common cyst to bleed/rupture
- No overdue periods → ectopic unlikely
- Not a dermoid (no typical features)
- Bleeding into cyst → hemoperitoneum

Q4.4: A 26-year-old nulliparous woman with acute lower abdominal pain, nausea, vomiting. USG: 6 cm right adnexal mass with whirlpool sign. Likely diagnosis?



Answer: Adnexal torsion

Explanation:

- Whirlpool sign: Twisting of ovarian pedicle
- Sudden, severe, waxing-waning pain
- Emergency diagnosis

Q4.5: How is adnexal torsion managed?

Answer:

- **Surgical emergency**
- Resuscitate + urgent **exploratory surgery** (laparoscopy/laparotomy)
- Detorsion + cystectomy
- Salpingo-oophorectomy only if necrosis present

BIG QUESTION 5: What are the causes and approach to postmenopausal bleeding?

Broad Answer: Postmenopausal bleeding (PMB) is defined as vaginal bleeding >12 months after the last menstrual period. While many causes are benign, PMB is a red flag for malignancy and requires a structured diagnostic approach.

DETAILED QUESTIONS

Q5.1: What is the most common cause of PMB in Indian women?

Answer: Cervical cancer

Q5.2: What is the most common uterine and global cause of PMB?

Answer: Senile (atrophic) endometritis

Q5.3: What other causes are associated with PMB?

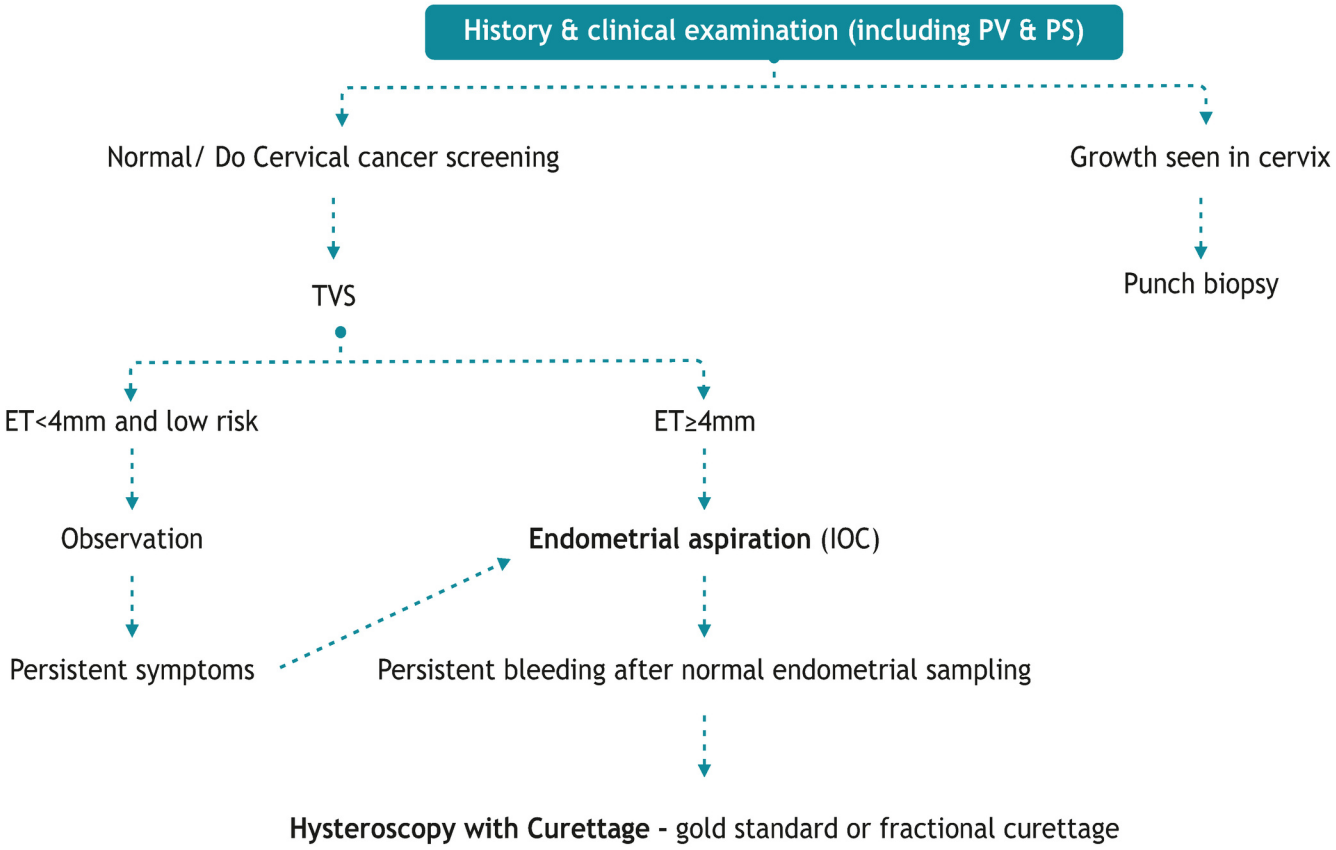
Answer:

- Endometrial hyperplasia
- Endometrial carcinoma (~10% of PMB cases)
- Tamoxifen
- Estrogen-containing HRT
- Estrogen-producing ovarian tumors

Q5.4: What is the diagnostic algorithm for PMB?

Answer:

1. History + Clinical exam (PV & speculum)
2. If growth seen → Punch biopsy
3. If cervix normal → TVS to assess endometrial thickness (ET)
4. If ET < 4 mm & low-risk → Observe
5. If ET ≥ 4 mm or persistent symptoms → Endometrial aspiration (IOC)
6. If results are inconclusive or symptoms persist → Hysteroscopy with curettage



Q5.5: A 50-year-old obese postmenopausal woman presents with heavy, irregular vaginal bleeding. Pelvic exam is normal. What is the best next step?

Answer: Endometrial biopsy

BIG QUESTION 6: What is the clinical approach to postcoital bleeding?

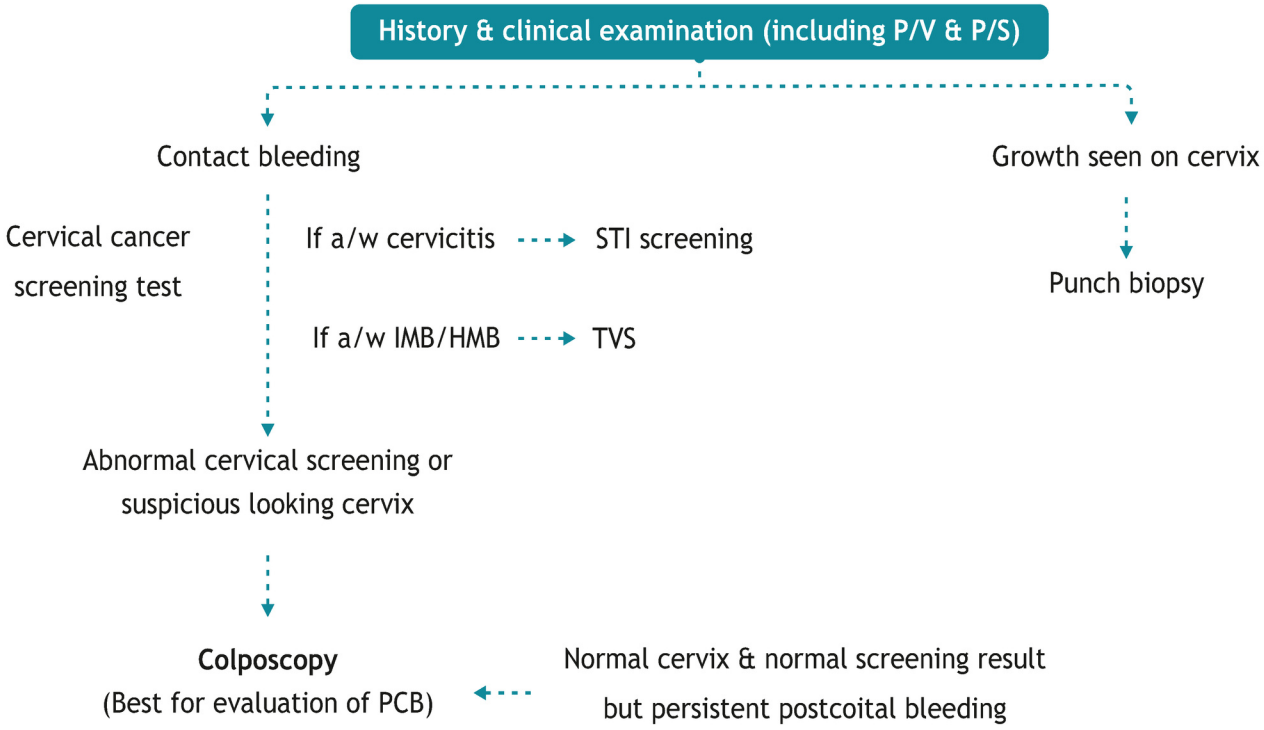
Broad Answer: Postcoital bleeding (PCB) is a concerning symptom often related to cervical pathology. It requires a stepwise evaluation to exclude infections, benign lesions, and cervical cancer.

DETAILED QUESTIONS

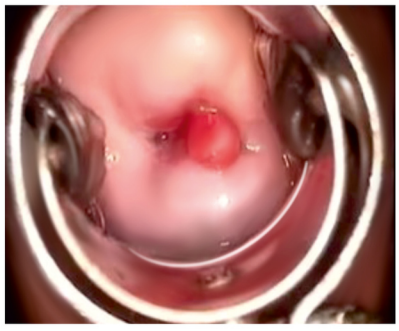
Q6.1: What is the most appropriate approach to evaluate postcoital bleeding?

Answer:

- History and pelvic examination (PV & speculum)
- Rule out cervicitis → STI screening
- If contact bleeding or visible cervical growth → Cervical cancer screening + Punch biopsy
- If intermenstrual or heavy bleeding → Add TVS
- If normal cervix + normal screening but persistent PCB → Colposcopy



Q6.2: A 35-year-old woman with postcoital bleeding has regular menses and normal speculum exam except for a cervical lesion. What is the likely diagnosis?



Answer: Endocervical polyp

BIG QUESTION 7: What are the features, risk factors, and screening strategies for cervical cancer?

Broad Answer: Cervical cancer is the most common gynecological cancer in Indian women, primarily caused by persistent HPV infection. Screening, vaccination, and early intervention reduce mortality.

DETAILED QUESTIONS

Q7.1: What is the most common HPV type associated with cervical cancer?

Answer: HPV 16 > 18 (HPV 18 is more associated with adenocarcinoma)

Q7.2: Which HPV oncoproteins are involved in viral replication and transformation?

Answer:

- E1 & E2 → Viral replication
- E6 → Targets p53
- E7 → Targets RB gene

Q7.3: What is the most common histological type of cervical cancer?

Answer: Squamous cell carcinoma (SCC), especially large cell non-keratinizing

Q7.4: What HPV types are associated with anogenital warts (condyloma acuminata), and what are the implications during labor?

Answer:

- Anogenital warts, also known as **condyloma acuminata**, are caused by **low-risk HPV types 6 and 11**.
- These types are **non-oncogenic**, but they cause external genital lesions.
- In **pregnant women with active genital warts**, **Cesarean section** is advised.
- This is to prevent **vertical transmission** of HPV to the neonate during vaginal delivery, which can cause **laryngeal papillomatosis**.



Q7.5: What are the WHO 2030 cervical cancer prevention targets?

Answer:

- 90% girls vaccinated by 15 years
- 75% women screened by 35 and again by 45 years
- 90% of identified cases receive appropriate treatment

Q7.6: What are the major risk factors for cervical cancer?

Answer:

- Early sexual activity and childbirth
- High parity
- Low socioeconomic status
- Multiple sexual partners
- Co-existing STIs and HIV
- Smoking (SCC)

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- OCP use (adenocarcinoma)

Q7.7: What is the clinical relevance of HPV vaccination?

Answer:

- **Quadrivalent vaccine (Gardasil/Cervavac):** Covers HPV 6, 11, 16, 18
- **9-valent vaccine (Gardasil-9):** Adds 31, 33, 45, 52, 58
- Given IM, 0.5 mL
- Age: 9-26 years (best: 9-14 years)
- Schedule:
  - 9-14 years: 2 doses (6 months apart)
  - ≥15 years: 3 doses (0, 1-2, and 6 months)
- WHO 2022: 1 dose may suffice for 9-20 yrs

Q7.8: Who should not receive HPV vaccination?

Answer: Pregnant women

Q7.9: Can sexually active women receive HPV vaccine?

Answer: Yes. No need for HPV testing before vaccination

Q7.10: Should vaccinated women still be screened?

Answer: Yes, screening is still required

BIG QUESTION 8: What are the screening methods and treatment strategies for cervical cancer?

Broad Answer: Cervical cancer screening includes cytology, HPV DNA testing, and VIA/VILI, depending on resources. Diagnosis is confirmed via biopsy or colposcopy, and pre-cancerous lesions are treated with ablative or excisional procedures.

DETAILED QUESTIONS

Q8.1: What is the recommended age range for cervical cancer screening?

Answer:

- Globally: 21-65 years
- India: 25-65 years
- Priority age: 30-49 years

Q8.2: What is the recommended screening interval?

Answer:

Method	Interval
HPV DNA testing / co-testing	Every 5 years (WHO: 5-10 yrs)
Cytology (Pap smear)	Every 3 years
VIA/VILI	Every 3 years

Stop screening at age 65 if:

- 2 negative HPV tests or
- 3 negative cytology tests in past 10 years

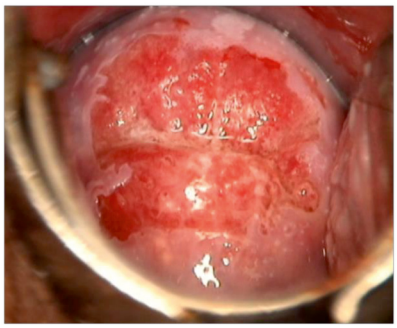
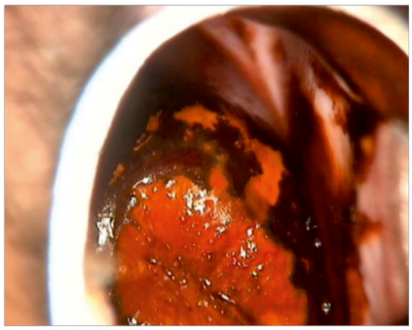
Q8.3: What screening is used in low-resource settings?

Answer:

- VIA (Visual Inspection with Acetic acid)
- Affordable primary HPV DNA testing (twice in a lifetime: at 35 and 45 yrs)

Q8.4: What are the differences between VIA and VILI?

Answer:

Method	Normal Area Response	Abnormal Area Response
VIA- Visual Inspection with Acetic acid (5%) 	No change (normal)	Turns white
VILI- Visual Inspection with Lugol's Iodine 	Brown (glycogen-rich epithelium)	Yellow (glycogen-poor/abnormal)

Q8.5: What is the cytology method and fixative used in Pap smear?

Answer:

- Conventional: Immediate fixation with 95% ethanol
- Liquid-based cytology: Methanol used
- Bethesda system used for reporting



Liquid-Based Cytology Kit

Q8.6: What tools are used for cytological sample collection?

Answer:

- Ayre's spatula (conventional)

- Cytobrush / Endocervical brush (LBC)



Ayre's Spatula

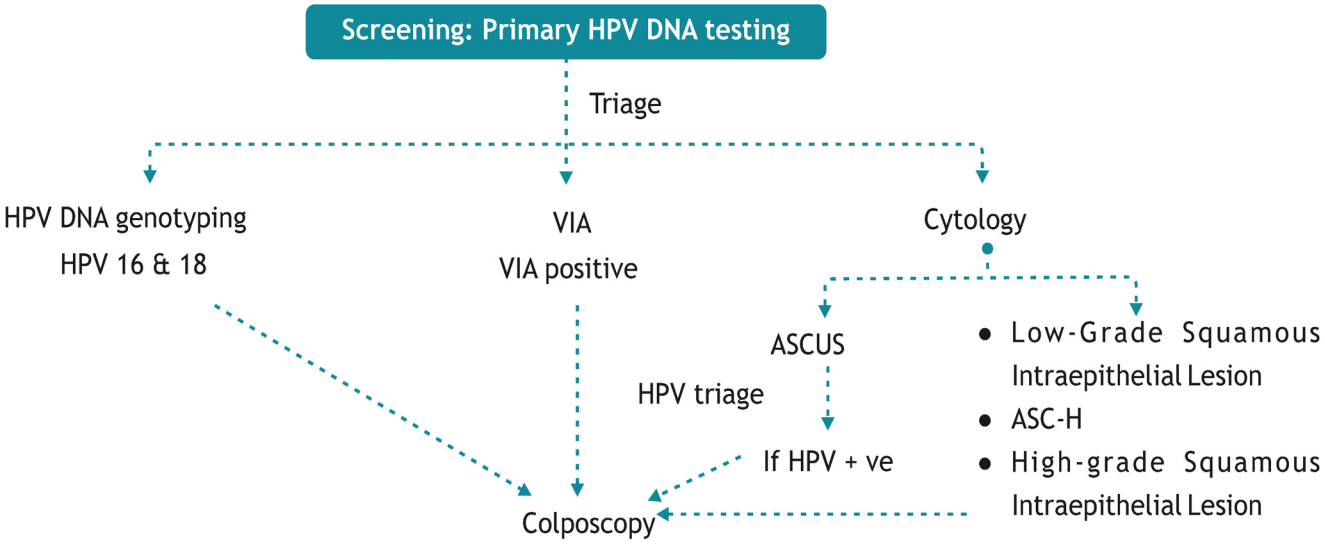


Endocervical Brush/ Cytobrush

Q8.7: What is the screen-triage-treat approach?

Answer:

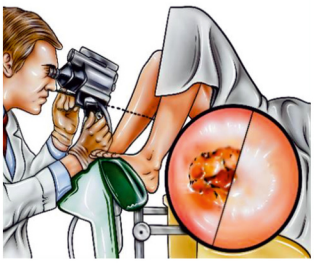
- Screen: HPV DNA testing
- Triage: VIA / Cytology / HPV genotyping
- Treat: Colposcopy or LEEP depending on findings

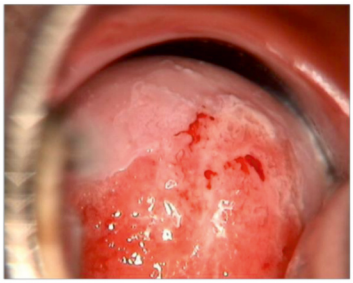


Q8.8: What findings are seen on colposcopy?

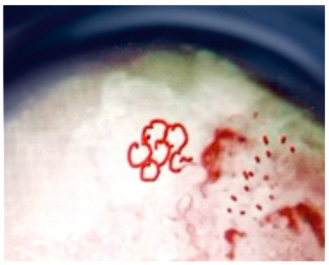
Answer:

- Uses 5% acetic acid → abnormal areas become acetowhite
- Coarse mosaic, punctation, abnormal vasculature
- Green filter enhances vessel visibility





Coarse mosaic pattern



Tile like pattern

Punctations

Q8.9: What is the classification of CIN based on histopathology?

Answer:



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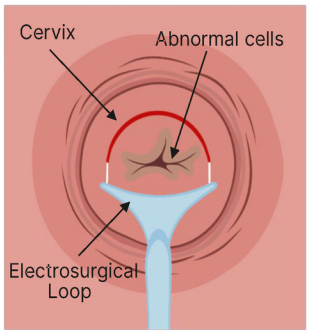
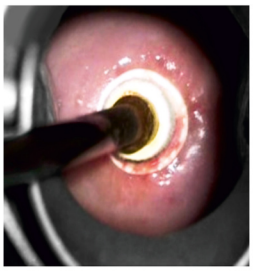
- Dysplasia in lower 1/3rd epithelium (Mild): **CIN 1**
- Dysplasia >1/3rd to 2/3rd epithelium (Moderate): **CIN 2**
- Dysplasia >2/3rd to full thickness (Severe): **CIN 3**

Grade	Dysplasia Depth	Cancer Risk
CIN 1	Lower 1/3 of epithelium	1% (observe)
CIN 2	1/3-2/3 of epithelium	5% (treat)
CIN 3	>2/3 to full thickness	20% (treat)

- In CIN, the basement membrane is not breached.
- p16 immunostaining is a surrogate marker for transforming HPV infection, especially useful in CIN 2 cases where it signals E7 oncoprotein overexpression.
- CIN 2 and CIN 3 are collectively termed high-grade CIN.

Q8.10: What procedures are used to treat CIN?

Answer:

Treatment	Indication	Notes
LEEP (LLETZ)  	CIN 2 or 3 (TOC)	OPD-based, low bleeding, preserves cervix Can be both diagnostic & therapeutic
Conization	Unsatisfactory colposcopy, suspicion of microinvasion, discrepancy in HPE	Diagnostic + therapeutic, under GA
Cryotherapy  	CIN 2/3 if lesion <75% of TZ, no endocervical involvement	Freeze-thaw-freeze technique; common SE: watery discharge

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Q8.11: What is p16 immunostaining used for?

Answer: Surrogate marker for high-risk HPV infection, especially used in CIN 2 for confirmation.

BIG QUESTION 9: What are the clinical presentation, staging, and treatment strategies for cervical cancer?

Broad Answer: Cervical cancer presents most commonly with irregular vaginal bleeding, and staging is based on clinical and imaging findings. Management is guided by FIGO staging and patient fertility considerations.

DETAILED QUESTIONS

Q9.1: What is the bimodal peak incidence of cervical cancer?

Answer:

- First peak: ~30 years
- Second peak: 44-55 years

Q9.2: What are the most common symptoms of cervical cancer?

Answer:

- Irregular vaginal bleeding (most common)
- Bloodstained vaginal discharge
- Postcoital bleeding (most specific)

Q9.3: What are the routes of spread in cervical cancer?

Answer:

- Most common: Lymphatic spread
- Others: Direct extension to adjacent tissues

Q9.4: What are the primary lymph nodes involved in cervical cancer?

Answer: Later involvement: Para-aortic or common iliac Note: Inguinal lymph nodes are rarely involved

Mnemonic: HOPES	Nodes Involved
H	Hypogastric (internal iliac group)
O	Obturator (most common)
P	Paracervical/parametrial/uterine
E	External iliac
S	Sacral

Q9.5: What symptoms suggest advanced cervical cancer?

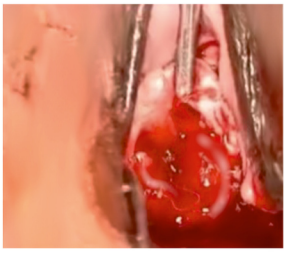
Answer:

- Flank pain (hydronephrosis)
- Leg swelling (lymphatic obstruction)
- Sciatica-like pain (pelvic wall invasion)

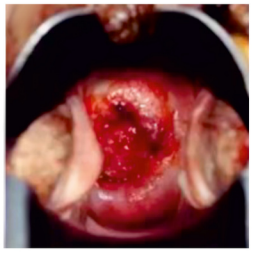
Q9.6: What are the types of cervical growths?

Answer:

- Exophytic friable growth → bleeds on touch
- Ulcerative lesion
- Infiltrating growth → cervix becomes hard, nodular
- Endocervical growth → barrel-shaped cervix (suggests adenocarcinoma)



Exophytic, friable, growth bleeds on touch



Ulcerative growth

Q9.7: What is the diagnostic method for suspected endocervical growth?

Answer: Conization

Q9.8: What is the FIGO 2018 staging system for cervical cancer?

Answer:

Stage	Description
I	Limited to cervix
Ia	Microinvasive (diagnosed on LEEP/conization)
Ia1	Invasion <3 mm
Ia2	Invasion 3-5 mm
Ib	Visible growth
Ib1	Size <2 cm
Ib2	2-4 cm
Ib3	>4 cm
IIa	Involves upper 2/3 of vagina
IIa1	<4 cm
IIa2	>4 cm
IIb	Parametrium but not to lateral pelvic wall
IIIa	Lower 1/3 of vagina
IIIb	Parametrium to lateral pelvic wall
IIIc	Pelvic/Para-aortic LN (regardless of tumor size)
IVa	Involves bladder/rectum
IVb	Distant metastasis

Additional notes:

- Hydronephrosis: stage III
- Bullous edema: not considered stage IV
- Staging = clinical exam + imaging (MRI for parametrium, CT for nodes)

Q9.9: What are the treatment options by stage and fertility status?

Answer:

Stage	Fertility Desired	Treatment
Ia1 (no LVSI)	Yes	Conization (therapeutic)
Ia1-Ia2 (LVSI+)	Yes	Radical trachelectomy + pelvic lymphadenectomy
Ib1	—	Radical hysterectomy (Meigs type III) + LNs
Ib2, IIa2	—	Chemoradiation (if >4 cm)
IIb+	—	Chemoradiation

- Fertility-preserving: Radical trachelectomy (removal of cervix + 1-2 cm upper vagina + parametrium + cerclage)
- Ovaries are retained in young women

Q9.10: What is the role of chemotherapy in cervical cancer?

Answer:

- Drug of choice: **Cisplatin**
- Used as a **radiosensitizer** in chemoradiation

Q9.11: What are postoperative adjuvant therapy indications?

Answer:

Risk Level	Criteria	Adjuvant Treatment
High	+ve LNs, +ve parametrium or margins	Chemoradiation
Intermediate	Tumor >4 cm, deep stromal invasion, LVSI	Radiotherapy
Low	None of the above	Surveillance

Q9.12: What are prognostic factors in cervical cancer?

Answer:

- Stage (most important)
- Nodal status
- Tumor volume
- Depth of invasion
- LVSI presence

Q9.13: What are recurrence patterns in cervical cancer?

Answer:

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- Most recurrences: within 3 years
- Most common site: central pelvis
- Presentation: bleeding
- With distant metastasis: palliative chemotherapy
- Local recurrence: managed based on prior therapy

BIG QUESTION 10: What are the key principles of radiotherapy in cervical cancer?

Broad Answer: Radiotherapy is a cornerstone in the management of cervical cancer, particularly in advanced stages. It involves external and internal techniques targeting pelvic tissues while minimizing damage to nearby organs.

DETAILED QUESTIONS

Q10.1: What is the tolerance of pelvic organs to radiation?

Answer:

Organ	Tolerance Dose (Gy)
Vagina	Most tolerant
Bladder	70 Gy
Rectum	60 Gy
Colon	50 Gy
Small bowel	40 Gy

Q10.2: What are chronic complications of radiation therapy?

Answer: Chronic effects occur due to **obliterative endarteritis**.

Q10.3: How does radiation intensity relate to tissue distance?

Answer: Effect of radiation is **inversely proportional to the distance** from the radiation source.

Q10.4: What is External Beam Radiotherapy (EBRT) and when is extended field used?

Answer:

- EBRT (Teletherapy) uses **Cobalt-60** or **linear accelerators**.
- **Extended Field Radiotherapy** is used when **para-aortic lymph nodes** are included in the radiation field.

Q10.5: What is Intracavitary Brachytherapy and which isotopes are used?

Answer:

- Radiation source placed in the **vagina or cervix**.
- **Cs-137** for low-dose rate (LDR) therapy
- **Ir-192** for high-dose rate (HDR) therapy

Q10.6: What are Point A and Point B in brachytherapy?

Answer:

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Point	Location relative to cervix	Corresponds To	Dose (Gy)
A	2 cm lateral from midline + 2 cm up	Parametrial lymph nodes	80 Gy
B	3 cm lateral from Point A	Obturator lymph nodes	80 Gy

BIG QUESTION 11: What is the hereditary risk in gynecologic cancers?

Broad Answer: Certain inherited genetic mutations such as **HNPCC** and **BRCA** significantly increase the lifetime risk of endometrial and ovarian cancers. Risk-reducing surgery and surveillance strategies are recommended.

DETAILED QUESTIONS

Q11.1: What is the risk of endometrial and ovarian cancer in Lynch syndrome (HNPCC)?

Answer:

- Endometrial cancer: **40-60%** lifetime risk
- Ovarian cancer: **10-12%** lifetime risk

Q11.2: What is the screening and prophylactic strategy for HNPCC mutation carriers?

Answer:

- Annual **TVS and endometrial aspiration (EA)** starting at **age 35**
- **Risk-reducing total hysterectomy with BSO** at **age 40** or earlier if childbearing is complete

Q11.3: What is the ovarian cancer risk in BRCA mutations?

Answer:

Mutation	Lifetime Ovarian Cancer Risk
BRCA1	45%
BRCA2	25%

Q11.4: What is the recommended strategy for BRCA mutation carriers?

Answer:

- Begin **TVS and CA-125** screening from **age 35**
- Consider **Risk-Reducing Salpingo-Oophorectomy (RRSO)** at **age 40** or earlier if family complete

Q11.5: What is the general population risk of ovarian cancer?

Answer: Approximately **1.4%** (1 in 70)

BIG QUESTION 12: What are the features, risk factors, and management of endometrial cancer?

Broad Answer: Endometrial cancer is the most common gynecologic malignancy in developed countries. It typically presents with postmenopausal bleeding and is associated with unopposed estrogen exposure. Staging is surgical, and recent updates incorporate molecular profiling.

DETAILED QUESTIONS

Q12.1: What are the major risk and protective factors for endometrial cancer?

Answer:

- **Risk factors:**
  - Unopposed estrogen: Obesity, PCOS, anovulation, estrogen-only HRT, granulosa cell tumor
  - Reproductive: Early menarche, late menopause, nulliparity, infertility
  - Drugs: Tamoxifen
  - Metabolic: Diabetes, hypertension (part of "Corpus cancer triad"), age >55 years
  - Genetic: Lynch syndrome (HNPCC)
- **Protective factors:**
  - Multiparity
  - Combined OCP use
  - Smoking (anti-estrogenic effect)

Q12.2: What is the average age of presentation and typical symptoms?

Answer:

- Average: 55-70 years (Median in India: 54 years)
- Most common symptom: Irregular vaginal bleeding
- Most specific complaint: Postmenopausal bleeding
- Pain: Late feature (referred to hypogastrium as "Simpson's pain")

Q12.3: What are typical examination and diagnostic findings?

Answer:

- PV examination often normal unless advanced disease
- Diagnostic test: Endometrial sampling and HPE

Q12.4: What are the common routes of spread and role of imaging?

Answer:

- Most common route: Direct extension
- **MRI:** Evaluate myometrial invasion, cervical and parametrium extension
- **CT scan:** Assess peritoneal and nodal metastasis

Q12.5: What are the types and histologic features of endometrial carcinoma?

Answer:

Type	Histology	Features
Type 1	Endometrioid	80%, estrogen responsive, younger women, good prognosis, pTEN mutation
Type 2	Serous/Clear cell	Estrogen independent, older/lean women, poor prognosis, p53 mutation

- Type 1 arises in hyperplastic endometrium, associated with atypical hyperplasia
- Type 2 arises in atrophic endometrium

Q12.6: What are important prognostic mutations in endometrial cancer?

Answer:

- Type 1:
  - **pTEN**: Common, good prognosis

  - o **kRAS**: Unfavorable prognosis
- Type 2:
  - o **p53**, **HER-2/neu**, **p16**: Poor prognosis

Q12.7: What are aggressive and non-aggressive histologies?

Answer:

- Non-aggressive: Endometrioid Grade 1 & 2
- Aggressive: Non-endometrioid and Grade 3 endometrioid

Q12.8: How is endometrial cancer managed when confined to the uterus?

Answer:

- **Surgical staging:**
  - o Extrafascial TAH + BSO
  - o Pelvic and para-aortic lymphadenectomy
  - o Add infracolic omentectomy for aggressive histology
- **Radical hysterectomy** if cervix is involved
- **Advanced stage:** Debulking surgery + chemoradiation

Q12.9: When can lymph node dissection be omitted?

Answer: If all the following are true:

- Endometrioid Grade 1 or 2
- Tumor size <2 cm
- <50% myometrial invasion
- No cervical or extrauterine spread
- No suspicious/enlarged nodes

Q12.10: What are the postoperative treatment guidelines?

Answer:

Group	Post-op Treatment
Stage IA / Grade 1-2	No adjuvant treatment
Type 2 histology	Post-op chemoradiation
Stage III/IV	Post-op chemoradiation
Grade 3 Endometrioid	Chemoradiation if >50% myometrial invasion

Q12.11: How is Stage III and IV endometrial cancer defined?

Answer:

- IIIA: Serosa or adnexal involvement
- IIIB: Vagina, parametrium, pelvic peritoneum
- IIIC: Pelvic or para-aortic lymph nodes
- IV: Bladder/bowel involvement, distant metastases, inguinal nodes

Q12.12: What are the recent updates in FIGO 2023 staging for endometrial cancer?

Answer: Histology, LVSI, and tumor grade are now integrated into staging

Stage	Description
I	Confined to uterine corpus
IA	Limited to endometrium or <50% myometrial invasion
IB	≥50% myometrial invasion
IC	Aggressive histology confined to endometrium
II	Cervical stromal involvement, substantial LVSI, or aggressive histology

Q12.13: What is the role of molecular profiling in endometrial cancer?

Answer:

Molecular Profile	Prognosis
POLE mutations	Excellent prognosis
p53 abnormal	Poor prognosis
MSI-high / MMR deficiency	Intermediate
No specific molecular profile	Baseline prognosis

BIG QUESTION 13: What are the features, risk factors, histologic types, and management of ovarian cancer?

Broad Answer: Ovarian cancer is the most lethal gynecological malignancy, commonly diagnosed in advanced stages due to vague symptoms. Epithelial tumors are the most frequent, particularly serous cystadenocarcinoma. Germ cell and sex-cord stromal tumors are more common in younger women. Management includes surgical staging and chemotherapy.

DETAILED QUESTIONS

Q13.1: What are the most common ovarian tumors?

Answer:

- Most common histological type of ovarian cancer: **Epithelial**
- Most common epithelial subtype: **Serous cystadenocarcinoma**
- Most common ovarian tumor overall: **Serous cystadenoma**

Q13.2: What are the risk and protective factors for epithelial ovarian cancer?

Answer:

- **Risk factors:** Nulliparity, Caucasian ethnicity, positive family history, BRCA mutations, early menarche, late menopause, increasing age, delayed childbearing, smoking (mucinous histology)
- **Protective factors:** Multiparity, breastfeeding, OCP use, salpingectomy, hysterectomy

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Q13.3: What are the histological features of various epithelial ovarian cancers?

Answer:

Histology	Features
Serous	Psammoma bodies; arises from fallopian tube; Type I (kRAS, BRAF); Type II (p53)
Mucinous	Multiloculated, mucin-filled, large, often unilateral; markers: CA-19.9, CEA
Endometrioid	Associated with endometrial cancer
Clear Cell	Aggressive; associated with endometriosis; hobnail cells; high-grade
Brenner	Transitional cell; solid, mostly benign; Walthard cell nests
Borderline	Low malignant potential; epithelial hyperplasia; no stromal invasion

Q13.4: What are clinical features of epithelial ovarian cancer?

Answer:

- Peak age: 56-60 years
- Often bilateral and diagnosed at a late stage
- Common symptoms: Non-specific GI symptoms
- Spread: Exfoliation along peritoneal surfaces
- Advanced disease may cause referred knee pain via obturator nerve

Q13.5: What are key features of mucinous histology?

Answer:

- Multiloculated, large, unilateral tumors with mucin
- Better prognosis
- Tumor markers: CA-19.9, CEA
- Associated with **pseudomyxoma peritonei** (most often due to **appendix cancer**)

Q13.6: Which histologies are associated with other gynecological findings?

Answer:

- **Endometrioid**: Most commonly associated with endometrial cancer
- **Clear cell > Endometrioid**: Associated with endometriosis
- **Clear cell**: Hobnail cells, high-grade

Q13.7: What are features of germ cell tumors?

Answer:

- Peak age: 10-30 years
- Usually unilateral, diagnosed early, often painful
- May present with **precocious puberty**
- Very chemosensitive; conservative surgery possible

Q13.8: What are features of dysgerminoma?

Answer:

- Most common germ cell malignancy and most common in pregnancy

- Tumor markers: LDH, PLAP, hCG
- Never secretes AFP
- 15% bilateral; lymphocytic infiltration on HPE
- Radiosensitive (radiation avoided to preserve ovaries)
- Can arise in dysgenetic gonads

Q13.9: What are features of other germ cell tumors?

Answer:

Tumor	HPE Findings / Markers
Immature Teratoma	Graded by neural tissue; no marker
Endodermal Sinus Tumor	Schiller-Duval bodies; **AFP**
Embryonal Carcinoma	Secretes **AFP and hCG**
Choriocarcinoma	Secretes **hCG**

Q13.10: What are sex-cord stromal tumors and their features?

Answer:

Tumor	Special Features
Granulosa Cell Tumor	Estrogen-secreting; AUB, PMB, precocious puberty; inhibin; Call-Exner bodies
Sertoli-Leydig Tumor	A/w hirsutism, virilization; Reinke crystals
Fibroma	Solid, benign; Meigs syndrome (ascites + right pleural effusion); secretes VEGF
Juvenile Granulosa Cell	Occurs in girls with precocious puberty

Q13.11: What are features of metastatic ovarian tumors?

Answer:

- Most common overall: **Endometrial cancer**
- Most common extragenital: **Colon adenocarcinoma**
- Krukenberg tumor: From stomach > breast; bilateral; intact capsule; signet ring cells on HPE

Q13.12: How is ovarian cancer surgically managed?

Answer:

- **Staging surgery:** Ascitic fluid/peritoneal cytology + representative biopsies + TAH + BSO + pelvic/para-aortic lymphadenectomy + infracolic omentectomy ± appendectomy (for mucinous type)
- **Debulking surgery** for advanced stage
- **Optimal debulking:** <1 cm residual tumor
- **Fertility-sparing:** U/L salpingo-oophorectomy + staging for:
  - Germ cell tumors
  - Borderline tumors
  - Stage Ia epithelial cancer
  - Granulosa cell tumor in young

Q13.13: What is the role of neoadjuvant chemotherapy?

Answer:

- For high-risk surgical candidates or unresectable tumors
- Neoadjuvant chemo → Interval debulking
- **No role** for ascitic fluid tap, FNAC, or biopsy pre-surgery due to high risk of peritoneal spread

Q13.14: What is the FIGO staging for ovarian cancer?

Answer:

Stage	Description
I	Limited to ovaries
Ia	One ovary, intact capsule
Ib	Both ovaries
Ic	Capsule rupture, malignant ascites
II	Spread to uterus, tubes, pelvic intraperitoneal structures
III	Retroperitoneal LNs, intra-abdominal peritoneal deposits, liver/spleen capsule
IV	Malignant pleural effusion, parenchymal liver/spleen mets, distant metastasis

Q13.15: What is the agent of chemotherapy for ovarian cancer?

Answer:

- **Epithelial cancer:** Paclitaxel + Carboplatin (DOC)
  - Given to all except stage Ia/Ib, grade 1/2 epithelial tumors
  - Always given if **clear cell histology**
- **Germ cell tumors:** BEP regimen (Bleomycin, Etoposide, Platinum)
  - Exemptions: Stage I dysgerminoma, stage I grade 1 immature teratoma

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7. PROLAPSE AND CONTRACEPTION

BIG QUESTION 1: What is the etiology of uterine prolapse?

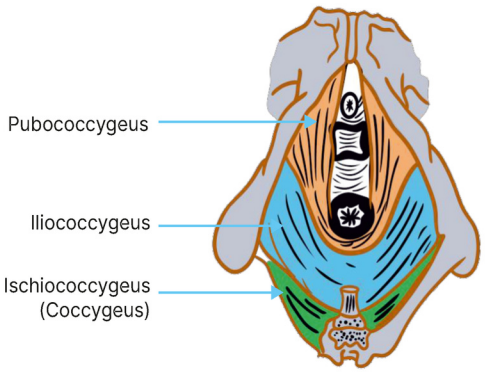
Broad Answer: Weakness of pelvic diaphragm and injury to the pelvic fibromuscular support.

DETAILED QUESTIONS

Q1.1: Which muscles form the pelvic diaphragm?

Answer: The Pelvic diaphragm is formed by:

- Levator ani
  - o Pubococcygeus
  - o Iliococcygeus
  - o Puborectalis (forms a sling around the rectum and now believed to be a separate muscle fibre)
- Ischiococcygeus (coccygeus)



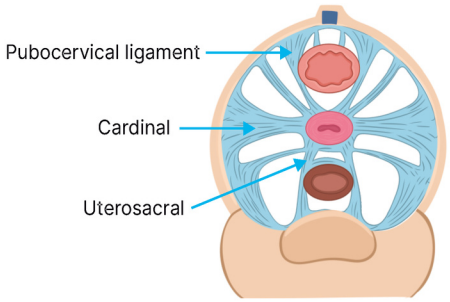
Q1.2: What is the nerve supply to the pelvic diaphragm?

Answer: Nerve to Levator ani (travels along the pelvic surface of pelvic diphragm)

Q1.3: What is the ligament support of uterus?

Answer: **Ligament support of uterus:**

- Anteriorly: Pubocervical ligament
- Posteriorly: Cardinal ligament
- Transversely: Uterosacral ligament



Q1.4: Why is the cardinal-uterosacral complex important?

Answer: It helps suspend external os at the level of ischial spine and maintain axis of vagina (almost horizontal in upright woman).

Q1.5: What type of support is provided by round and broad ligament?

Answer: Type of support provided by:

- Round ligament: False support
- Broad ligament: No support

Q1.6: What are the risk factors for uterine prolapse?

Answer: Risk factors are:

- Myopathy of pelvic muscles, neuropathy
- Ligament supports (not true ligaments, are condensations of connective tissue → weakened during process of pregnancy, childbirth and delivery).
- Frequently spaced deliveries

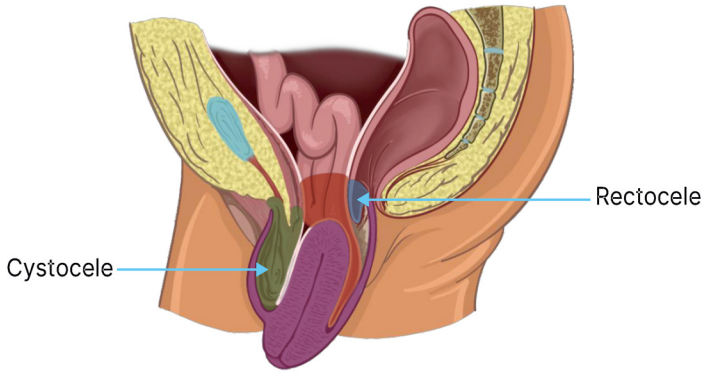
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- Mismanagement of labor
- Faulty instrumentation
- Prolapse is more commonly encountered in postmenopausal women due to weakening of connective tissue from estrogen deficiency
- Raised intraabdominal pressure

Q1.7: What are DeLancey's levels of pelvic support?

Answer: De Lancey's level of pelvic support:

Level of support	Associated defects
Apical/Level I • Uterosacral-cardinal complex	• Uterocervical descent • Post hysterectomy vault prolapse • Enterocele
Midlevel/Level II • Rectovaginal fascia and septum posteriorly • Pubocervical fascia anteriorly	• Rectocele posteriorly • Cystocele anteriorly
Distal/Level III • Pelvic diaphragm (gives support to all levels) and perineal body	• Urethrocele • Gaping introitus • Deficient perineum



BIG QUESTION 2: What is Shaw's Classification used for?

Broad Answer: Grading of uterocervical descent

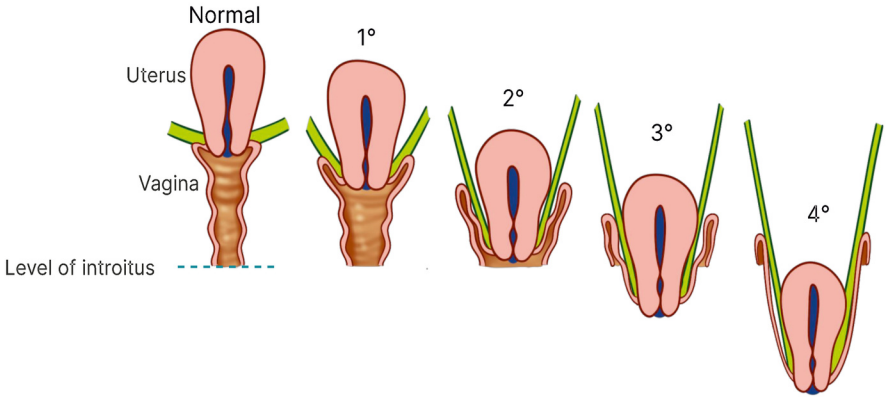
DETAILED QUESTIONS

Q2.1: What are the degrees of Shaw's classification?

Answer: Shaw's Classification:

1st Degree	Descent of cervix below the level of ischial spine but above introitus
2nd Degree	Descent of cervix upto introitus
3rd Degree	Cervix outside introitus but fundus still inside
4th Degree/Procedentia	Fundus outside introitus

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Q2.2: What is the reference point in Shaw's classification?

Answer: Level of introitus

Q2.3: What is the normal position of cervix?

Answer: At the level of ischial spine

BIG QUESTION 3: What os POPQ System?

Broad Answer: **POPQ (pelvic organ prolapse quantification) System:**

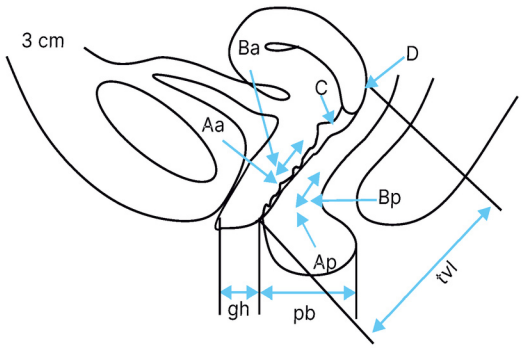
- Standardized system of documenting prolapse

DETAILED QUESTIONS

Q3.1: What anatomical landmarks are measured in the POP-Q system?

Answer: Anatomical landmarks:

Anterior wall Aa	Anterior wall Ba	Cervix or cuff C
Genital hiatus gh	Perineal body pb	Total vaginal length tvl
Posterior wall Ap	Posterior wall Bp	Posterior fornix D



Q3.2: What is the point of reference in POPQ system?

Answer: Hymen

Q3.3: What defines stage of prolapse in POPQ system?

Answer: Most leading portion of prolapse which can be cervix, rectocele, enterocele, or cystocele.

Q3.4: What are the stages of POPQ system?

Answer: Stages of POPQ system are:

Stage 0	No prolapse demonstrated
Stage I	Most distal portion of prolapse >1cm above level of hymen
Stage II	Most distal portion of prolapse within 1cm of hymen
Stage III	Most distal portion of prolapse >1cm below level of hymen
Stage IV	Complete or near complete eversion of vagina

Q3.5: What are the features of cystocele?



Answer: Features of cystocele:

- C/o something coming out of vagina, difficulty urinating, stress urinary incontinence (activity increase intra-abdominal pressure)
- Bulge from anterior abdominal wall
- **Splinting action:** Manually push up the part to urinate

Q3.6: How does prolapse with decubitus ulcer appear?

Answer: **Features of prolapse with decubitus ulcer:**

- Cervix lying outside introitus
- Examination: Confirm whether fundus of uterus is outside introitus or not
- **Rectocele:** On lifting cervix up bulge in posterior vaginal wall
- **Decubitus ulcer:** Due to venous congestion in prolapsed tissues
- Decubitus ulcer is first treated, then surgery is performed



Q3.7: What is the treatment of decubitus ulcer?

Answer: Vaginal packing with glycerin and Acriflavine.

BIG QUESTION 4: What is the surgical management for pelvic organ prolapse?

Broad Answer: Vaginal hysterectomy with pelvic floor repair (postmenopausal)

DETAILED QUESTIONS

Q4.1: What are the types of pelvic floor repair?

Answer: **Pelvic floor repair:**

- Anterior colporrhaphy (cystocele repair)
- Posterior colporrhaphy (rectocele repair)
- Perineorrhaphy (strengthen and recreate perineal body)

Q4.2: Which procedure is used to strengthen vault and enterocele repair?

Answer: McCull's Culdoplasty

Q4.3: What are the consequences of not repairing an enterocele or suspending the vaginal vault?

Answer: Risk of vault prolapse in future (can happen months to years later)

Q4.4: What is the indication for Le Fort's Colpocleisis?

Answer: Obliterative procedure Le Fort's Colpocleisis is reserved for those who are not fit for major surgery and are not going to be sexually active.

Q4.5: What is the disadvantage of Le Fort's Colpocleisis?

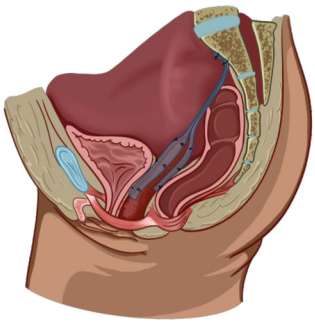
Answer: Limit vaginal access to cervix and uterus for future.

Q4.6: What are the abdominal procedures for enterocele repair?

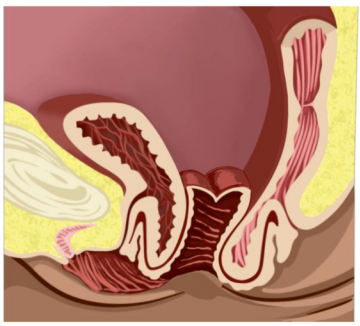
Answer: Halban's and Moschawitz repair

Q4.7: What is the best surgery for vault prolapse management?

Answer: Sacrocolpopexy (mesh is used).



Sacrocolpopexy

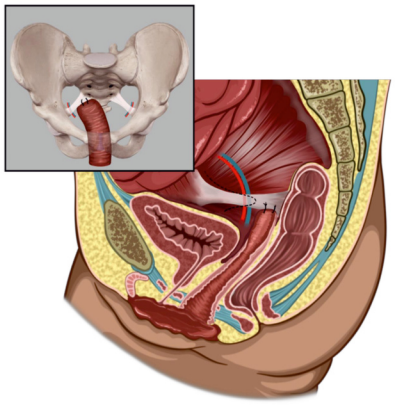


Vault prolapse

Q4.8: What are the other options for management of Vault prolapse?

Answer: Other options for Vault prolapse:

- Sacrospinous fixation of vault, where vault is sutured/fixed to sacrospinous ligament
- Colpocleisis
- Uterosacral ligament fixation



Sacrospinous fixation of vault

Q4.9: Create a case scenario on prolapse in a young multiparous woman with presentation and diagnosis.

Answer: **Presentation:**



- **Physical examination:**
  - Cervix lying outside the introitus .
  - Feel for cervix throughout its entire length.
  - Shallow fornix, no rectocele noted → Minimal enterocele noted.
- Ask patient to cough to observe bulge in anterior vaginal wall → No cystocele

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- **Digital examination:** Evaluate for 3rd/4th degree prolapse
- **Diagnosis:** 3rd degree uterocervical descent + supravaginal elongation of cervix → typically seen in younger women with prolapse.

Q4.10: What is the difference between prolapse and congenital elongation in relation to the vaginal fornix?

Answer: **Vaginal fornices:**

- Shallow: Prolapse
- Deep: Congenital elongation

Q4.11: Manchester surgery is indicated in?

Answer: Young multiparous woman, family complete wants to retain uterus (generally have supra-vaginal elongation of cervix).

Q4.12: What is the surgical technique used in Manchester surgery?

Answer: It is similar to **Fothergill's repair**.

- Involves D and C
- Amputation of cervix
- Plication of cardinal ligament in front of cervical stump.

Q4.13: What is Sturmdorf suture technique?

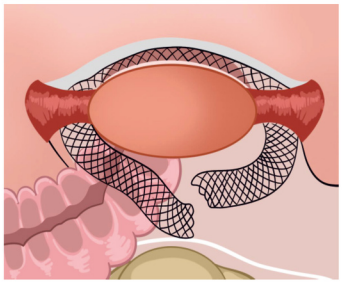
Answer: It is used to cover cervical stump with vaginal mucosa.

Q4.14: What is Shirodkar's modification?

Answer: It avoids cervical amputation → Can be done in woman who wants to get pregnant in future.

Q4.15: What is Sacro-hysteropexy?

Answer: Uterus-preserving option for those who want future childbearing.



SACRO-HYSTEROPEXY

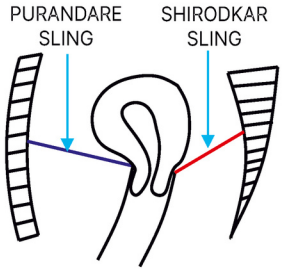
Q4.16: What are the surgeries for nulliparous prolapse?

Answer: Sling surgeries

Q4.17: What are the sling surgeries?

Answer: Sling surgeries:

Shirodkar sling	• Posterior sling attaching isthmus to sacrum • Best results obtained • Technically more difficult • Risk of nerve injury posteriorly in psoas muscle especially genitofemoral nerve
Purandare sling	• Anterior sling connecting isthmus to rectus sheath anteriorly • Risk of enterocele in future
Khanna sling	Anterior sling connecting isthmus to ASIS
Virkud sling	Composite sling





Q4.18: What is depicted by the image shown?

Answer: **Image depicts:**

- Cervix reaching upto introitus (2nd degree uterocervical descent)
- Cystocele
- Rectocele

Q4.19: Although pessaries are suitable for any degree of prolapse, who are the ideal candidates for their use?



Ring pessary

Answer: Indications are:

- Unfit for surgery
- Want to avoid surgery
- Pregnant woman with prolapse

Q4.20: What is Kegel's exercise?

Answer: Pelvic floor strengthening exercises → Advised to pregnant woman with mild degree of prolapse and non-surgical management of stress urinary incontinence.

BIG QUESTION 5: What is the most common type of urinary incontinence in women?

Broad Answer: Overall m/c type in women: Stress urinary incontinence

DETAILED QUESTIONS

Q5.1: What is the association between urinary incontinence and urethral hypermobility or intrinsic sphincter deficiency?

Answer: Due to urethral hypermobility and lack of support of pelvic diaphragm → Bladder neck descent.

Q5.2: What are the components of mixed urinary incontinence commonly seen in older women?

Answer: Mixed type consists of:

- Component of stress incontinence
- Component of urge incontinence

Q5.3: What is urge incontinence?

Answer: Sense of urgency → By the time woman reaches toilet, few drops of urine is passed.

Q5.4: If a urinary tract infection is excluded and urgency is reported, what should be done next?

Answer: Urodynamic studies

Q5.5: What are the tests to check for urethral hypermobility?

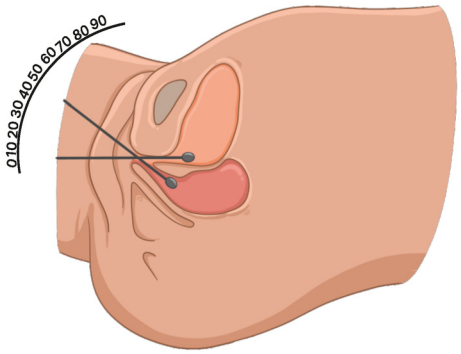
Answer: Q-tip Test and Bonney's Test.

- Limited utility in clinical practice

Q5.6: What is the procedure and interpretation of Q tip test?

Answer: Q-tip test:

- **Technique:** Q-tip put inside urethra → Asked to cough/Valsalva → Q tip moves and angle can be noted.
- Angle >30 degrees: Bladder neck descent, urethral hypermobility.



Q-Tip Test

Q5.7: What is the treatment for urge incontinence with detrusor overactivity?

Answer: Urge incontinence associated with detrusor overactivity (unstable bladder):

- Bladder training exercises
- Anticholinergic drugs
  - Beta agonist (mirabegron)

Q5.8: Which drug is approved for stress urinary incontinence?

Answer: Duloxetine (alpha adrenergic agonist)

Q5.9: What is the first-line treatment for stress urinary incontinence?

Answer: Lifestyle modification and pelvic floor exercise.

BIG QUESTION 6: What are the surgeries for Stress Urinary Incontinence (SUI)?

Broad Answer: Surgeries are:

- Midurethral slings **(procedure of choice)**
- Retropubic urethropexy
- Other surgeries:
  - Kelly's plication
  - Needle suspension surgery (Stamey's, Pareyra)

DETAILED QUESTIONS

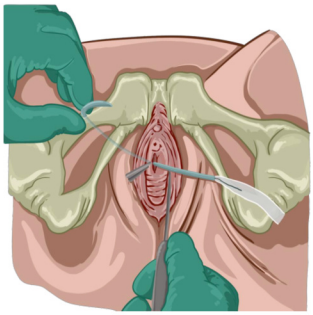
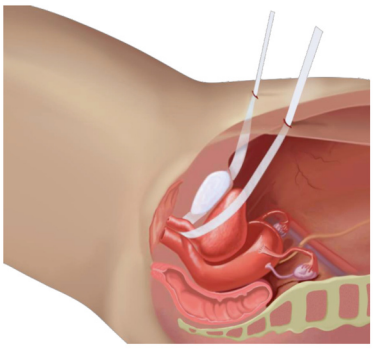
Q6.1: How do midurethral slings work?

Answer: Sling placed in manner as it gives buttressing support to midurethra → Effective for both urethral hypermobility/intrinsic sphincter deficiency.

- More effective as compared to colpo-suspension surgeries

Q6.2: What do TOT and TVT refer to in the treatment of urinary incontinence?

Answer: Midurethral sling procedures:

Transobturator Tape (TOT)	Transvaginal Tape (TVT)
Needle designed specially in manner that tape comes out, travels **through obturator foramen.**	Travels through **space of Retzius.**
	

Q6.3: What is retropubic urethropexy?

Answer: Surgery done in retropubic space.

- Urethra (proximal) hitched to something → anatomically urethra is pulled up so that bladder neck descent is corrected.
- Useful in bladder neck descent, urethral hypermobility.

Q6.4: What are the types of Retropubic Urethropexy?

Answer: **Types:**

Burch Colposuspension	Marshal Marchetti Krantz Procedure
Proximal urethra suspended to **Cooper ligament**	Proximal urethra suspended to **pubic bone** Almost **obsolete** now due to risk of **pubic osteitis.**

Q6.5: What is the management of vault prolapse with associated stress urinary incontinence?

Answer: Sacrocolpopexy + Colposuspension

Q6.6: What types of repair can be done by Kelly's plication?

Answer:

Urethrovaginal	Between urethra and vagina
Vesicovaginal	Between bladder and vagina
Ureterovaginal	Between ureter and vagina
Vesico-uretrine (rare)	Between uterus and bladder

BIG QUESTION 7: Write a short note on VVF

Broad Answer: VVF most commonly occurs due to obstructed labor in low-resource settings and surgical bladder injury worldwide. Ischemic necrosis leads to a delayed presentation (7-10 days) with continuous dribbling of urine per vagina. Ureterovaginal fistula differs as the patient can still hold urine, while urethrovaginal fistula presents with leakage only during urination. Diagnosis is aided by the three-swab test and cystoscopy, with Youssef's syndrome (vesico-uterine fistula) presenting as the triad of amenorrhea, menouria, and incontinence. Management includes treating UTI first, timing surgery once tissues are healthy, and repairing with techniques like Chassar Moir excision or Latzko's colpocleisis.

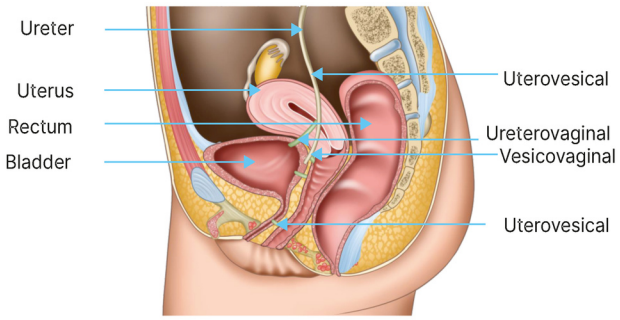
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DETAILED QUESTIONS

Q7.1: What is the most common cause of VVF (Vesicovaginal Fistula)?

Answer: The most common cause of VVF:

- In low resource settings: Obstetric VVF (obstructive labor)
- Worldwide: Post-surgical (post-traumatic) → Unidentified bladder injury → Delayed presentation in form of VVF



Q7.2: How does ischaemic necrosis in tissues influence the presentation of a fistula?

Answer: Delayed presentation of fistula

Q7.3: What are the sequence of events of VVF?

Answer: Primary event (obstructive labor/surgical event) → Delayed presentation (usually 7-10 days later) → Present with continuous dribbling of urine from vagina.

Q7.4: If a fistula is observed or palpated on the anterior vaginal wall and the patient is unable to control urination, what is the most probable diagnosis?

Answer: VVF (Vesicovaginal Fistula)

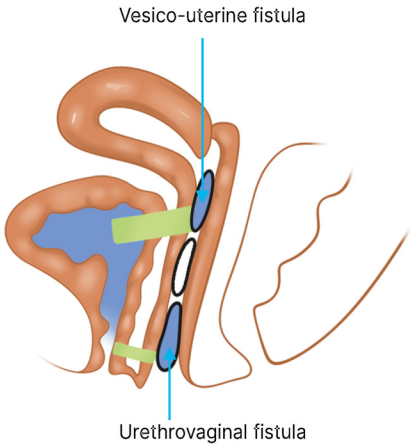
Q7.5: What are the features of ureterovaginal fistula?

Answer: Features:

- Mostly traumatic
- Continuous dribbling occurring but other side ureter is also filling up bladder
- If there is only ureterovaginal fistula, no other fistula: Patient will be able to hold urine

Q7.6: What is the likely diagnosis if there is no continuous dribbling of urine, but during urination, urine passes from both the urethra and the vagina?

Answer: Urethrovaginal fistula



Q7.7: What is the triad of vesico-uterine fistula?

Answer: The triad **(Youssef syndrome)** of **Vesico-uterine fistula** (rare):

- Urinary incontinence
- Amenorrhea
- Menouria (cyclical hematuria)
  - Menstrual blood comes out of urinary tract

Q7.8: A woman presents with continuous dribbling of urine per vagina. On per speculum examination, no fistulous opening is visualized or palpated, but the speculum blades collect urine. What is the next appropriate investigation?

Answer: Three swab test

Q7.9: What is three swab test?

Answer: Fill up bladder with methylene blue dye → Fill vagina with 3 swabs → Ask woman to walk around for little while → Remove swab and analyze.

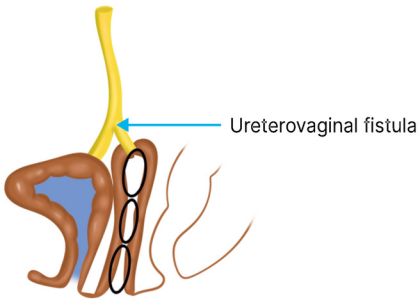
Q7.10: What is the interpretation of the three-swab test results?

Answer: **Interpretation:**

Uppermost swab stain blue	Vesicovaginal fistula
Lowermost swab stain blue	Urethrovaginal fistula
Middle swab	Don't give much idea (can get stained by diffusion from upper or lower swab)

Q7.11: A patient can hold and void urine normally, but the swabs in the three-swab test are wet with urine and not stained blue. What is the most likely diagnosis?

Answer: Ureterovaginal fistula



Q7.12: What is the best investigation for VVF?

Answer: **Cystoscopy** and simultaneously cystourethroscopy also done.

Q7.13:What management is required for a patient with a urinary tract infection before surgical repair?

Answer: Treatment of UTI is done before surgical repair.

- Sample for urine culture and sensitivity is catheter sample, sometimes suprapubic catheter sample maybe needed.

Q7.14: What is the timing of surgical repair of VVF?

Answer: Individualized, based on physical condition of surrounding tissues (healthy tissue without inflammation).

Q7.15: What are the surgical options for VVF repair?

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Answer: Surgery for VVF Repair:

- **Chassar Moir technique:** Fistula tract excised
- **Latzko's colpocleisis:** Suitable for small post
- **Hysterectomy fistulas:** Fistulous tract not excised

BIG QUESTION 8: Which index is commonly used to evaluate how effective a contraceptive method is?

Broad Answer: **Pearl's index:** Number of contraceptive failures per 100 women per year.

DETAILED QUESTIONS

Q8.1: What are the long-acting reversible methods of contraception?

Answer: Includes:

- Copper T
- Mirena
- Progesterone implants

Q8.2: What is an irreversible method of contraception?

Answer: Tubal ligation

Q8.3: Which contraceptive method has the least failure rate?

Answer: Implanon (lesser failure rate, even less than tubal sterilization)

Q8.4: What is the medical eligibility criteria for contraceptive use?

Answer: It is:

Category 1	Condition for which no restriction for use of particular method
Category 2	Condition where advantage of using method outweighs risks
Category 3	Conditions where risks outweigh benefit of method
Category 4	Condition where use of method is absolutely contraindicated

Q8.5: Which category/categories of medical eligibility criteria are generally used?

Answer: Categories 1 and 2

- Category 3 and 4: Method is generally not preferred

Q8.6: Which category/categories of medical eligibility criteria are contraindicated?

Answer: Categories contraindicated are:

- Category 3: Relative contraindication
- Category 4: Absolute contraindication

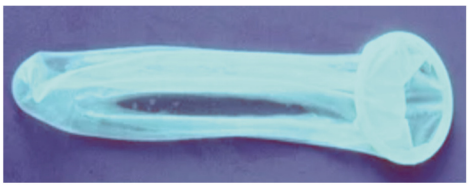
Q8.7: What is the most common reason for failure of condom?

Answer: Inconsistent use of method

- Condom: Protect against STIs and HIV

Q8.8: What are the types of condoms?

Answer: Types:

Male Condom	Female Condom
• Open at one end and closed at the other end • Ring present at the open end	2 rings present: • At open end: Comes out of introitus • At closed end: Covers up cervix
	

Q8.9: What is diaphragm and cervical cap?

Answer: They are:

Diaphragm	Cervical cap
For improved efficacy used with spermicidal jelly	For improved efficacy, used with spermicidal jelly
 Diaphragm	 Cervical cap

Q8.10: What is the spermicidal agent in vaginal sponge (Today)?

Answer: Pre-coated with spermicidal agent - Nonoxynol 9



Q8.11: Why do diaphragms, cervical caps, and vaginal sponges provide protection against some STIs but not against HIV?

Answer: Vaginal mucosa is not covered (as with condom) and cannot be used in prolapse cases as they need to be fitted inside.

Q8.12: How do spermicidal jellies act?

Answer: Spermicidal jellies act as surface acting agents to disrupt sperm cell membrane and immobilize sperm.

YOURWISH

YOURWISH

BIG QUESTION 9: How do Hormonal contraceptives work?

Broad Answer: Mechanism of action of Hormonal Contraceptives:

- **Main MOA:** Inhibition of ovulation (decreased Gonadotropin levels), leading to:
  - Decreased FSH (follicular growth suppressed)
  - Decreased LH (ovulation suppressed)
- **Progesterone only contraceptive**
  - Makes cervical mucus thick
  - Alters tubal motility
  - Makes endometrium thin

DETAILED QUESTIONS

Q9.1: What are the types of progesterone-only contraceptives?

Answer: They are:

- POPs (progesterone only pills) (also inhibits ovulation)
- Injectable forms (also inhibits ovulation)
- Implants

Q9.2: What are the earliest POPs?

Answer: Minipills

Q9.3: How do minipills work?

Answer: Work only by progesterone related effects (did not inhibit ovulation)

Q9.4: Which progesterone-only pill (POPs) is currently available, and what is the safe window for intake?

Answer: Cerazette (75 µg Desogestrel) → Inhibits ovulation

- Safe period: 12 hours

Q9.5: How are combined oral contraceptives classified based on the type of progestin they contain?

Answer: Combined hormonal contraceptives:

Class	Progestins
1st Generation	Norethindrone/Norethistrone
2nd Generation	Levonorgestrel and Norgestrel
3rd Generation	Desogestrel, Gestrinone, Norgestimate
4th Generation	Drosperinone, Cyproteron, Dienogest

Q9.6: What are the side effects of combined oral hormonal contraceptives?

Answer: They are:

- **1st and 2nd Generation** (mostly with 1st and lesser with 2nd)
  - Androgenic S/E
  - Altered lipid profile
  - Insulin resistance
- **3rd Generation:** Least androgenic S/E
- **4th Generation:** Anti-androgenic

Q9.7: How are combined oral contraceptives classified based on the dosage of estrogen?

Answer: They are:

Class	Dose
Usual Dose OCPs	30µg Ethinyl Estradiol (EE) + 150µg LNG → Mala-N, Mala-D
Low Dose OCPs	20µg of EE
Ultra-low Dose OCPs	10µg of EE

Q9.8: What is the lowest possible dose of EE in OCPs?

Answer: 10µg (ultra-low dose OCPs)

Q9.9: Which oral contraceptive pill is provided free of cost by the Government of India?

Answer: Mala-N

- Mala-D: At subsidized cost

Q9.10: Which conditions are classified as absolute contraindications (category 4) to OCP use?

Answer: Absolute C/I:

- Age >35 years + smoker
- Migraine with aura
- Stroke and past h/o venous thrombosis
- Breast cancer
- CAD, Complicated valvular heart diseases
- Hypertension (uncontrolled)
- Diabetes with vasculopathy
- Active liver diseases with decompensated cirrhosis (compensated cirrhosis is not C/I)

Q9.11: What are the contraindications to progestins?

Answer: Contraindications are:

- Category 4:
  - Undiagnosed vaginal bleeding
  - Breast cancer
- Category 3:
  - Acute liver diseases
  - Decompensated cirrhosis

Q9.12: What is the most common side effect of progestins?

Answer: Irregular vaginal bleeding (mild, spotting)

- M/c reason of discontinuation of progesterone only methods

BIG QUESTION 10: How does oral contraceptive use influence the risk of various cancers?

Broad Answer: Risk of cancers:

- Increased risk of cervical cancer and hepatic adenoma (rare and benign)
- Decreased risk of endometrial, ovarian and colon cancer
- Risk of breast cancer maybe slightly raised with current use
- No relation to gall bladder cancer and HCC

DETAILED QUESTIONS

Q10.1: What is the most common side effect of OCPs?

Answer: Breakthrough bleeding

Q10.2: What is the recommended method for using Mala-N oral contraceptive pills?

Answer: **Mala-N**



- 21 hormone containing pills and 7 iron containing pills (pill free interval)
- 3 weeks of hormones on and 1 week off of hormones (should not be >7 days)
- Taken at same time everyday (habit forming)
- The pill packet has to be started within the first 5 days of the LMP
- If started late → backup for 7 days

Q10.3: What should be done if a woman misses one or two 30 microgram ethinylestradiol (EE) pills, or one 20 microgram EE pill?

Answer: Take one pill as soon as she remembers (even if it means she has to take 2 pills together) and continue rest as usual.

Q10.4: What should be done if a woman misses three or more 30 microgram EE pills, or two or more 20 microgram EE pills?

Answer: Take one pill as soon as she remembers and continue rest as usual + Backup method for 7 days + Consider Emergency Contraception.

Q10.5: What should be done if a woman misses a pill during the 3rd week of her cycle?

Answer: Finish hormonal pills + Discard non-hormonal pills, and Start new pack next day.

BIG QUESTION 11: What is Antara?

Broad Answer: It is Depo-Provera (depot medroxy progesterone acetate) → Inhibits ovulation

- Available free of cost (govt. Of India) by name Antara



DETAILED QUESTIONS

Q11.1: What is the dose of Depo-Provera?

Answer: 150 mg IM every 3 months

Q11.2: What is the grace period of Depo-Provera?

Answer: 2 weeks before and 2 weeks after due date → give injection

- If later → Rule out pregnancy → Give injection + Backup method for 7 days
- Can be used freely postpartum after 6 weeks

Q11.3: What is the contraception of choice in epilepsy and Sickle cell diseases?

Answer: Depo-Provera (depot medroxyprogesterone acetate) or Antara

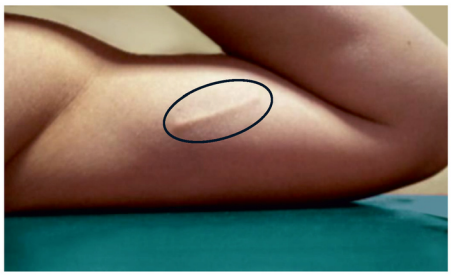
Q11.4: What is the most common side effect of Depo-Provera?
Answer: Irregular vaginal bleeding

Q11.5: Why is Depo-Provera not preferred in adolescents and perimenopausal women?
Answer: It decreases bone mineral density (once method is stopped, it recovers)

Q11.6: What is the typical delay in the return of fertility after stopping Depo-Provera?
Answer: Approximately 12 months, with a maximum of around 18 months.

BIG QUESTION 12 What is Implanon?
Broad Answer: Subdermal single rod implant.

- Inserted in medial aspect of upper arm (non-dominant)



Implanted Implanon rod in medial aspect of arm

DETAILED QUESTIONS

Q12.1: What does Implanon contain?
Answer: Etonogestrel (68mg)

Q12.2: What is the mechanism of action of Implanon?
Answer: Inhibition of ovulation

Q12.3: What is the contraceptive life span of Implanon?
Answer: 3 years

Q12.4: What is the most common side effect of Implanon?
Answer: Irregular vaginal bleeding

Q12.5: How does Nexplanon differ from Implanon?
Answer: Nexplanon (progesterone implant) is radio opaque.

Q12.6: What is Capronor?
Answer: Biodegradable implant containing Levonorgestrel lasting for about 1 year

BIG QUESTION 13: What are the newer combined hormonal contraceptive methods containing estrogen and progesterone both?
Broad Answer: They are:

- NuvaRing
- Anovera
- Transdermal patches

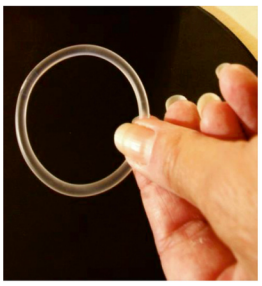
DETAILED QUESTIONS

Q13.1: Can you explain what the NuvaRing is?
Answer: NuvaRing

YOURWISH

- 1 ring for a single cycle
- 3 weeks of ring on and 1 week ring free





Q13.2: What is the safe period of NuvaRing?

Answer: 3 hours

Q13.3: What is Annovera?

Answer: Annovera:

- One ring for 1 year (13 months)
- 3-week ring on and 1 week ring off





Q13.4: How to use transdermal patches?

Answer: Applied to buttocks, outer arm, lower abdomen

- Should be properly adherent to skin (drug absorption will be affected and efficacy will decrease).



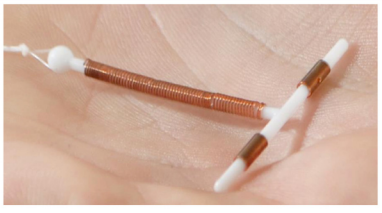
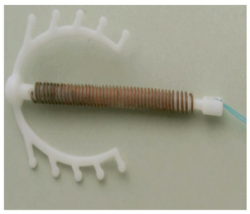
Q13.5: What are the advantages of Transdermal patches?

Answer: Advantage:

- Avoid first pass metabolism in liver
- No risk of venous thromboembolism

BIG QUESTION 14: Provide images of CuT 380A, Mirena, and Multiload CuT 375?

Broad Answer: IUDs

CuT 380 A	Mirena	Multiload CuT 375
		

DETAILED QUESTIONS

Q14.1: Describe CuT 380 A.

Answer: CuT380 A

- A is for arms
- Releases copper @50 µg/day
- Effective for 10 year
- Available free of cost in GOI supply

Q14.2: Describe Mirena.

Answer: **Mirena:**

- Has a cylinder but no copper wire
- Contains 52 mg LNG released @20 µg/day
- Effective for 5 years (contraceptive efficacy)
  - However drug can be released upto 7-10 years

Q14.3: Describe Multiload CuT 375.

Answer: **Multiload CuT 375**

- Effective for 5 years
- Not available for free of cost in GOI supply

Q14.4: Distinguish between CuT and Mirena.

Answer:

Features	CuT	Mirena
MOA	Inhibition of fertilization > implantation Cu ions → Toxic to sperms	Inhibition of implantation
Inhibit ovulation	No	No
Failure rate	0.3-0.8%	0.2% (as effective as tubal sterlization)
Special point	Used as emergency contraceptive	Treatment of AUB

Q14.5: What are the absolute contraindications to IUDs?

Answer: Absolute contraindications:

- Active genital tract infection, Current PID
- Genital tract malignancy, GTN
- Unexplained vaginal bleeding
- Anatomical abnormalities of uterus
- Puerperal sepsis, post septic abortions
- Suspected pregnancy
- Past h/o PID or ectopic (not a C/I)
- HIV infection (not a C/I)
  - Female with HIV: CuT (contraceptive efficacy) + Condoms (prevent spread)
- Wilson Disease (specific C/I for CuT)
- Breast cancer: Specific C/I for Mirena (C/I for progestins applicable to Mirena also)

Q14.6: What is the best time to insert CuT?

Answer: Timing:

- Postplacental: Within 10 minutes of placental delivery
- Postpartum: Within 48 hours of delivery
  - o If not → Later has to be given after 4 weeks.

Q14.7: What is the most common side effect of CuT?

Answer: Bleeding > Pain (dysmenorrhea)

Q14.8: What is the most typical infection associated with CuT?

Answer: Actinomyces

- Most infections occur within 3 weeks of insertion → Polymicrobial (ascending infections).
- Infections which occur later while CuT in situ are mostly STI (CuT is not responsible for infections).

Q14.9: What is the management of a woman with CuT in situ having genital tract infection?

Answer: Treat infection 1st (antibiotic) → Then removal of CuT

- Routine antibiotics during insertion are not recommended

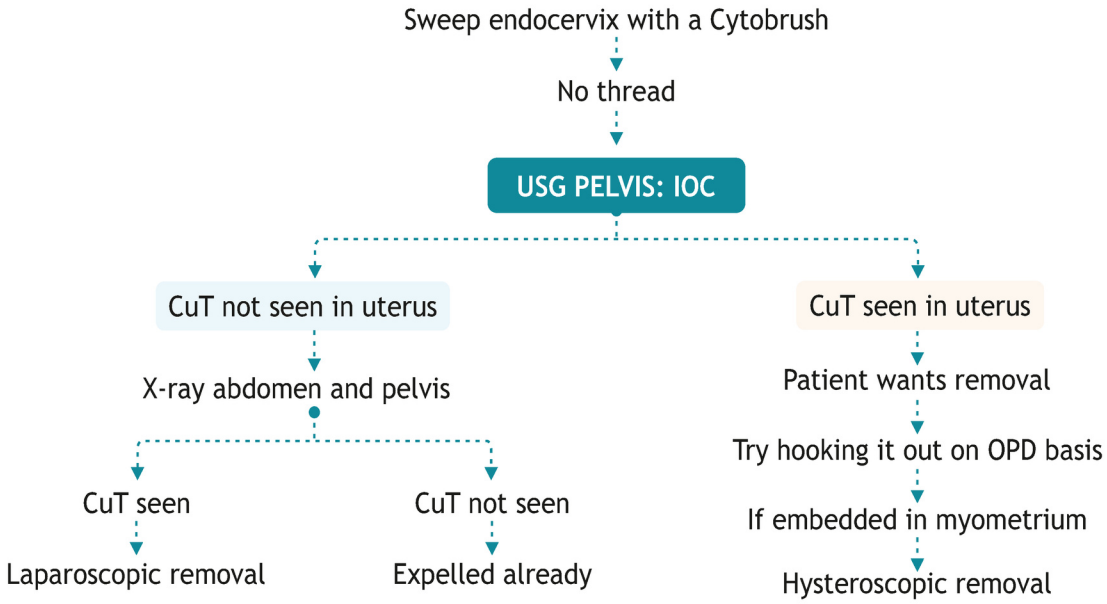
Q14.10: How much is the risk of perforation of uterus in CuT?

Answer: About 1 in 1000 (most perforation happen during time of insertion)

- Risk of expulsion of CuT does not necessarily depends on type of IUD.

Q14.11: How should a case be approached when there is a history of CuT insertion but the thread is not visible?

Answer: Approach:



- If CuT is visible on USG pelvis, then check the correct position → Can reassure, no need to remove

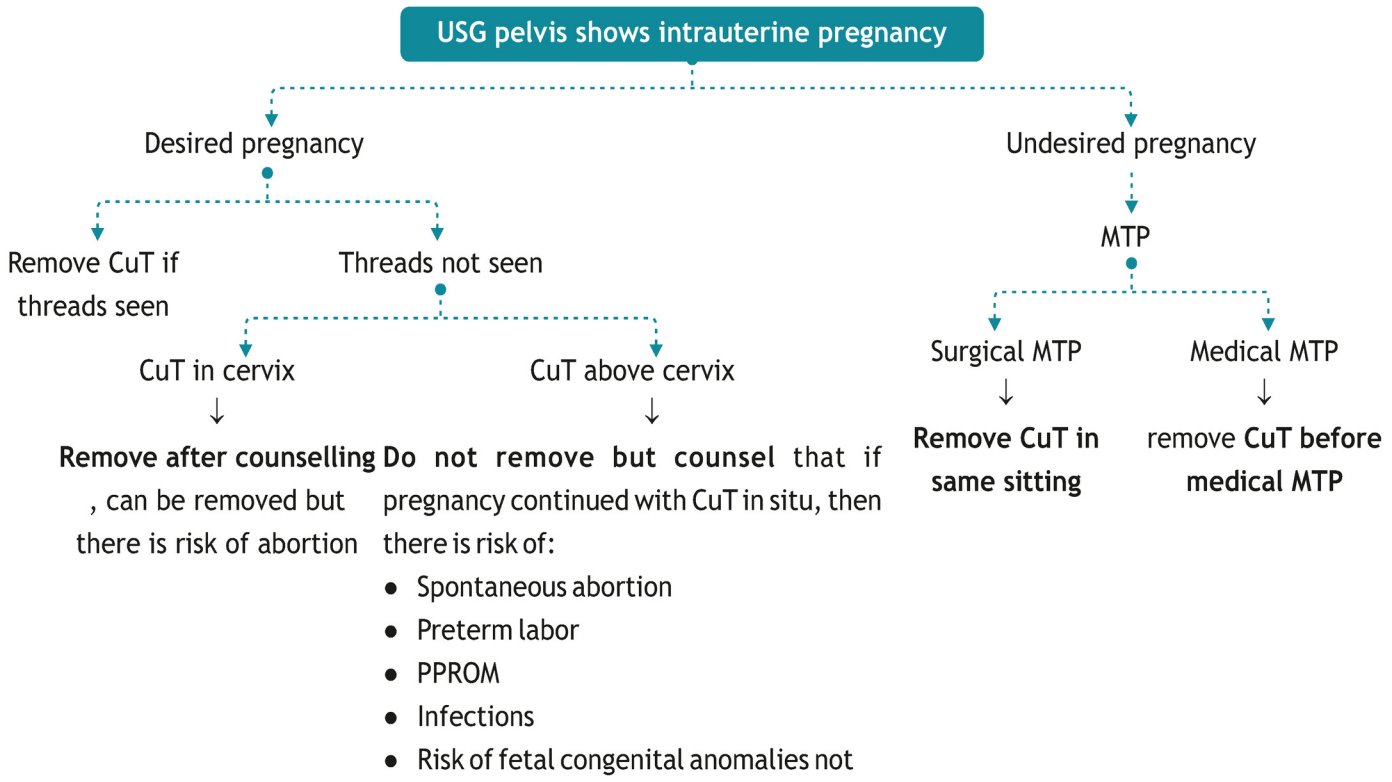
Q14.12: What is the initial step in managing a pregnancy with a CuT (copper intrauterine device) in situ?

Answer: USG pelvis to rule out ectopic pregnancy

YOURWISH

Q14.13: How to approach a case of pregnancy with CuT in situ?

Answer:



Q14.14: If a pregnancy occurs with a history of CuT in situ but the CuT is not visualized during pregnancy, and after delivery the placenta is examined and the CuT is still not found, what should be the next step?

Answer: X-ray abdomen and pelvis

BIG QUESTION 15: What is the most commonly used over-the-counter method of emergency contraception?

Broad Answer: Ezzy pill (LNG containing I pill) → single tablet

DETAILED QUESTIONS

Q15.1: What is the dose of LNG containing I pill for emergency contraception?

Answer: 1.5mg single tablet → As soon as possible within 72 hours of unprotected intercourse (failure rate: 1-2%).

Q15.2: What is the main mechanism of action?

Answer: Delay in ovulation (not an abortifacient)

Q15.3: What is the most effective emergency contraception?

Answer: CuT, inserted within 5 days of unprotected intercourse

- **MOA:** Inhibition of fertilization > Inhibition of implantation
- Effective even if ovulation has already occurred in cycle
- Not preferred in woman with increased risk of STI, rape victims
- Option for woman who are willing to continue with CuT

YOURWISH

YOURWISH

Q15.4: What is the most effective hormonal emergency contraception?

Answer: Ulipristal acetate (Ella)

- Prescription needed
- Can be taken within 120 hours of unprotected intercourse
- Dose: 30mg

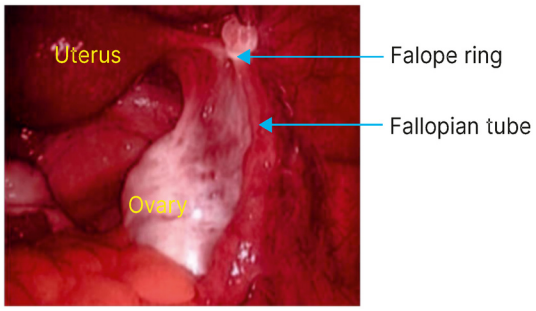
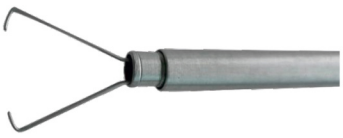
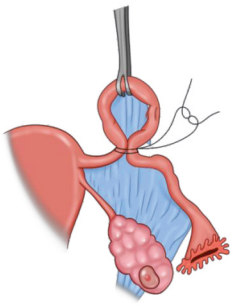
Q15.5: What are some other options for emergency contraception?

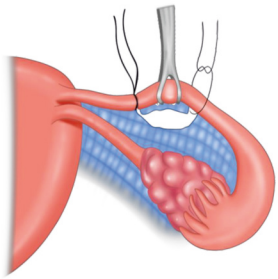
Answer: They are:

- OCPs (Yuzpe)
- Mifepristone (not used in clinical practice and dosage as low as 10mg has been used)
- Centchroman (2 tablets (total dose: 60mg) → 12 hours later another 2 tablets repeated) → taken within 12 hours of unprotected intercourse.

BIG QUESTION 16: What are the methods of tubal ligation?

Broad Answer: They are:

Method	Image
Laparoscopic Tubal Ligation using a Falope Ring • White colour ring on fallopian tube • Loop of tube formed looking blanched	 Laparoscopic tubal ligation
Laparoscopic Ring Applicator • Site of tubal ligation: Isthmus (narrow portion of fallopian tube available). • Site is same in both laparoscopy and laparotomy.	 Laparoscopic ring applicator  Terminal end of ring applicator
Modified Pomeroy's Method • Plain catgut absorbable suture • Failure rate: About 0.4% *Pomeroy's Method: Chromic catgut sutures are used*	

Parkland's Method • Separate sutures tied at 2 ends and middle portion of tubal segment cut. • Failure rate: About 0.2%	

DETAILED QUESTIONS

Q16.1: What are the Government of India (GOI) guidelines for tubal ligation?

Answer: GOI guidelines:

- Client should be ever married, age of woman >22 years, should have atleast 1 child, atleast 1 year old.
- Lower limit of age of woman can be relaxed if she has ≥ 3 children
- Consent of spouse - not mandatory

Q16.2: When is interval tubal ligation performed, and which route is most commonly used?

Answer: Within 7 days of LMP, most commonly by Laparoscopic route.

Q16.3: When is postpartum sterilization performed?

Answer: Postpartum tubal ligation is done by Minilaparotomy

- Within 7 days of delivery
- Modified Pomeroy's techniques is used.

Q16.4: When is tubal ligation performed following an abortion or during a cesarean section?

Answer: Done as:

- Surgical MTP or within 7 days of surgical MTP
  - When a woman in the first trimester opts for both MTP and tubal ligation, the MTP is performed surgically, and the most common route for tubal ligation is laparoscopy.
- Surgical MTP in 2nd trimester (minilaparotomy)
- If medical MTP done: Tubal ligation after next cycle

8. OBG BASICS

BIG QUESTION Q1: What are the basics of conception and implantation?

Broad Answer:

- Fertilization occurs at the ampulla-isthmus junction.
- Sperm-oocyte fusion → cortical reaction prevents polyspermy → meiosis II completes → zygote formed.
- Zygote → cleavage → morula enters uterine cavity on Day 4.
- Implantation begins Day 6, ends Day 10, most commonly at upper posterior uterine wall, dependent on progesterone.
- Involves apposition, adhesion, invasion → interstitial type of implantation.
- Hartman's sign: implantation bleeding.

DETAILED QUESTION

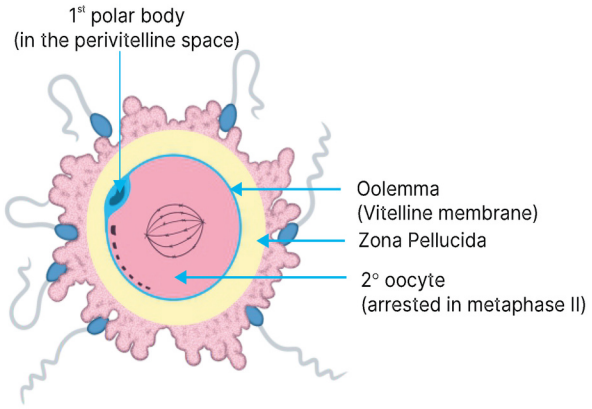
Q1.1 Where does fertilization occur?

Answer: Ampulla of fallopian tube (junction of ampulla and isthmus).

Q1.2 What is the role of polar bodies in conception?

Answer:

- **First polar body:** present in perivitelline space.
- **Second polar body:** released after sperm-oocyte fusion (completion of meiosis II).



Q1.3 How does the sperm bind and penetrate the oocyte?

Answer:

- Sperm binds zona pellucida (ZP) via ZP3 receptors → triggers acrosome reaction.
- Penetrates ZP and binds oolemma (oocyte membrane) via Fertilin protein (FERTILIN gene).
- Oocyte membrane depolarizes.

Q1.4 What is the cortical and zona reaction?

Answer:

- Cortical granules released → zona reaction.

- Zona hardening → prevents polyspermy.

Q1.5 How does meiosis II resume and zygote form?

Answer:

- Secondary oocytes are arrested in metaphase II.
- Resumes meiosis after sperm binding.
- Releases a second polar body.
- Fusion of male + female pronucleus zygote.

Q1.6 What are the stages of early cleavage and morula formation?

Answer:

- Zygote cleavage: 30 hrs post-fertilization.
- 8-celled morula enters the uterine cavity on Day 4.
- Travel: ~3 days through the fallopian tube.
- Nutrition during transit: pyruvate-rich tubal secretions.

Q1.7 What is the most common site and mechanism of implantation?

Answer:

- **Site:** Upper posterior wall of uterus.
- **Mechanism:** Invasiveness of trophoblast cells.

Q1.8 What are the molecular steps in implantation?

Answer:

- Apposition: Selectins.
- Adhesion: Integrins.
- Invasion: Matrix metalloproteinases (MMPs).

Q1.9 What is the timeline and window of implantation?

Answer:

- Begins: Day 6 after fertilization.
- Completes: Day 10 after fertilization.
- Window: Day 20-24 of the menstrual cycle.

Q1.10 What hormones and histological findings are key in implantation?

Answer:

- Endometrium prepared by: Progesterone.
- Histology: Stromal edema.
- Type in humans: Interstitial implantation.
- Decidua formation: Completed by Day 10.
- Hormone responsible for decidualization of endometrium: Progesterone.

Q1.11 What is Hartman's sign?

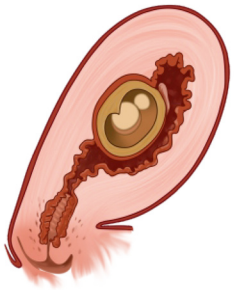
Answer: Bleeding during implantation Mayy be confused with menstruation.

BIG QUESTION 2: How does the placenta develop and establish circulation?

YOURWISH

Broad Answer: The placenta forms from maternal decidua and fetal chorion. Early development involves decidual differentiation, chorionic villi, lacunae, and vascular remodeling of spiral arteries, establishing utero-placental and feto-placental circulation.

DETAILED QUESTIONS



Q2.1: What are the maternal and fetal components of placenta development?

Answer:

- Maternal component: Decidua basalis.
- Fetal component: Chorion frondosum.

Q2.2: What is decidua vera and when does decidual space disappear?

Answer:

- Decidua vera = Decidua parietalis + Decidua capsularis.
- Decidual space is obliterated by 14-16 weeks as embryo grows.

Q2.3: What are fetal membranes and their origin?

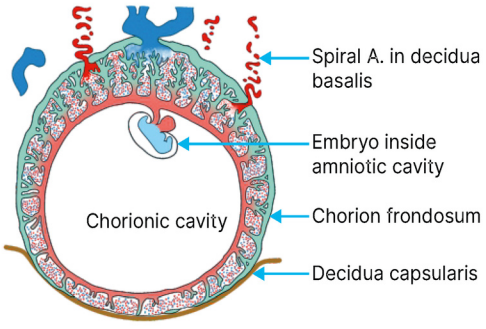
Answer:

- Fetal membranes: Amnion + Chorion.
- Chorion → develops from trophoblast layer + extraembryonic mesoderm.
- Amnion → derived from fetal ectoderm.
  - Avascular layer.
  - Provides tensile strength (rich in collagen).
  - Synthesizes PGE2 and fetal fibronectin.

Q2.4: What are important pointers in early placental development?

Answer:

- Decidua capsularis → lies towards uterine cavity.
- Chorionic villi → develop towards embryonic side (decidua basalis → chorion frondosum → vascular).
- Villi towards anembryonic end → chorion laeve → flatten, remain avascular.
- Lacunae in syncytiotrophoblast → future intervillous spaces.



Q2.5: When do lacunae appear and how is uteroplacental circulation established?

Answer:

- Lacunae appear: ~Day 12 of fertilization.
- Filled by maternal blood → uteroplacental circulation established ~Day 15.

Q2.6: When do fetal vessels and fetoplacental circulation become functional?

Answer:

- Fetal vessels in chorionic villi functional: by Day 17 of fertilization.
- Connect to main fetal circulation → fetoplacental circulation established ~Day 21.

Q2.7: What is the role of extravillous cytotrophoblast in vascular remodeling?

Answer:

- Extravillous cytotrophoblast invades spiral arteries in decidua basalis.
- Converts spiral arterioles → loose vascular channels (vascular remodeling).
- Remodeling completed by ~16 weeks.

Q2.8: What are the phases of vascular remodeling?

Answer:

- **Phase 1:** Completed by 12 weeks.
- **Phase 2:** Completed between 12-16 weeks.

Q2.9: What condition is associated with defective vascular remodeling?

Answer: Pre-eclampsia → due to incomplete/defective vascular remodeling.

Q2.10: When is the final chorionic plate formed?

Answer: Between 8-10 weeks of gestation.

BIG QUESTION 3: What is the structure, circulation, and function of the placenta?

Broad Answer: Placenta is a discoid, deciduate organ weighing about 500 g at term, with dual circulation (uteroplacental and fetoplacental). It serves as the interface for maternal-fetal exchange, oxygen delivery, and immunological protection, with a specialized placental barrier that evolves with gestation.

DETAILED QUESTIONS

Q3.1: What is the shape, type, weight, and blood content of placenta?

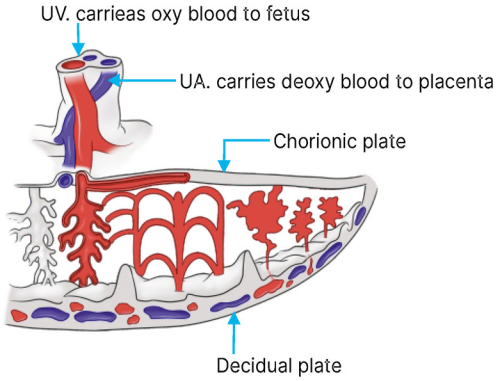
Answer:

- Discoidal shape
- Deciduate type (part of decidua shed off when placenta separates)
- Weighs ~500 g at term
- Contains ~500 ml blood
  - 150 ml in intervillous spaces
- Maternal blood is present in intervillous spaces

Q3.2: What are the umbilical vessels and their functions?

Answer:

- Umbilical vein (single, left): Carries oxygenated blood to fetus
- Umbilical arteries (two): Carry deoxygenated blood to placenta



Q3.3: What is the ratio of placental weight to fetal weight?

Answer:

- At term → 1:6
- Equal at 17 weeks of gestation

Q3.4: What are the maternal and fetal components of the placenta?

Answer:

- Decidual plate → Maternal component
- Chorionic plate → Fetal component
- Spiral arterioles bring blood into intervillous spaces

Q3.5: What is the circulation at term?

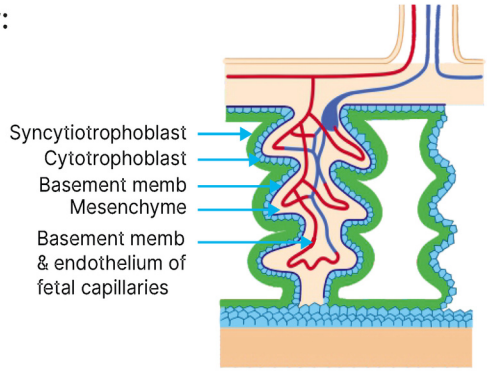
Answer:

- **Physiological functional unit of placenta:** Lobule (cotyledon) → area supplied by 1 primary stem chorionic villus
- **Uteroplacental circulation:** ~700-900 ml/min
- **Fetoplacental circulation:** ~400 ml/min
- **Umbilical cord protection:** Wharton's jelly (protective connective tissue around umbilical vessels)
- **Oxygen delivery:** ~8 ml/min/kg
- **Oxygen saturation in intervillous space:** 65-75%
- **pO_2 in intervillous space:** 30-35 mmHg
- **Oxygen saturation in the umbilical vein:** Similar, but slightly lower pO_2
- **Fetal hemoglobin (HbF):** Higher oxygen affinity than adult Hb

Q3.6: What is the placental barrier and its evolution?

Answer:

- Intervillous space filled with maternal blood
- Cytotrophoblast layer becomes scant/absent by 16 weeks
- Term placenta → syncytiotrophoblast thinned out
- Fetal macrophages in mesenchyme → Hofbauer cells
- Layers of the placental barrier:



Q3.7: What type of placenta is present in humans?

Answer: Hemochorial placenta → Maternal blood in intervillous space directly contacts syncytiotrophoblast.

Q3.8: How does the placenta prevent fetal rejection?

Answer:

- Villous trophoblasts lack MHC molecules
- Extravillous cytotrophoblasts express only MHC class Ia & HLA-G immune tolerance

- Immunomodulated state of pregnancy:
  - Intact humoral immunity
  - Suppressed cytotoxic immunity
  - Th2 >> Th1 response
- Pregnancy hormones aid immune tolerance
- Decidual NK cells:
  - Non-cytotoxic
  - Secreted cytokines & chemokines promoting trophoblast invasiveness

BIG QUESTION 4: What are the major hormones secreted by the placenta and their roles?

Broad Answer: Placenta secretes glycoproteins (hCG), polypeptides (hPL), steroid hormones (progesterone & estrogen), and protein hormones (relaxin) that regulate maternal adaptation, fetal growth, and pregnancy maintenance.

DETAILED QUESTIONS

Q4.1: What are the properties and production site of hCG?

Answer:

- Glycoprotein hormone with α & ß subunits
- Half-life: ~24 hours
- Produced by syncytiotrophoblast cells

Q4.2: What are the functions of hCG?

Answer:

- Maintains the corpus luteum in early pregnancy
- Acts like LH → stimulates fetal testes to produce testosterone male sexual differentiation
- Acts like TSH → stimulates the maternal thyroid gland

Q4.3: How and when is hCG detected? What are the diagnostic tests?

Answer: Detected in maternal serum by Day 22 of cycle (~8 days after fertilization / ~5 days before missed period)

- Urine Pregnancy Test (UPT):
  - Positive by the day of the missed period
  - Based on the ELISA principle
  - Sensitivity ~25 IU/L
- Most sensitive tests: Fluoroimmunoassay > Radioimmunoassay > ELISA

Q4.4: What conditions are associated with high and low hCG levels?

Answer:

High HCG	Low HCG
Molar pregnancy, GTN	Failing intrauterine pregnancy, abortion
Multiple pregnancy	Ectopic pregnancy
Erythroblastosis fetalis	
Trisomy 21	Trisomy 18

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Q4.5: What are the kinetics and clinical significance of hCG levels?

Answer:

- **Doubling time:** 1.4-2 days in healthy pregnancy
- **Peak:** 8-10 weeks (~100,000 IU/L)
- **Plateau:** 16 weeks (~10,000 IU/L)
- **Decline:** after 1st trimester
- **Normalization:**
  - 2 weeks after delivery
  - After abortion: Longer (3-4 weeks → if 1st trimester abortion) → due to initially high levels)

Q4.6: What is Human Placental Lactogen (hPL) and its functions?

Answer:

- Secreted by syncytiotrophoblast
- Polypeptide hormone, half-life ~15 minutes
- Structurally similar to GH
- First detected in maternal serum at ~3 weeks post-fertilization
- Functions:
  - Causes insulin resistance
  - Promotes lipolysis
  - Levels reflect placental wellbeing
- Most abundantly produced placental hormone at term (~1 g/day)

Q4.7: What are key points about placental steroid hormone production (progesterone & estrogen)?

Answer: Placenta lacks 17α-hydroxylase → Has 3β-hydroxysteroid dehydrogenase & aromatase.

Progesterone	Estrogen
• Substrate: LDL cholesterol from maternal circulation • Placenta takes over by 8 weeks • Luteal-placental transition: 7-10 weeks • Beyond 10 weeks: placenta sole source • Removal of corpus luteum before 7 weeks → abortion • Progesterone = precursor for fetal adrenal corticosteroids	• Substrate: DHEA-S (from fetal adrenals) • Placenta converts via aromatase • Estriol: produced in greatest amount (weak, short half-life, appears ~9 weeks) • Estradiol: highest maternal serum concentration

Q4.8: What is Relaxin and its physiological roles?

Answer: Protein hormone

- Functions:
  - Relaxes smooth muscle → vasodilation →↑ renal blood flow & GFR
  - Remodels connective tissue of reproductive tract
- Does not increase peripheral joint laxity

Big Question 5: What are the major physiological changes that occur in pregnancy?

Broad Answer: Pregnancy causes physiological changes in multiple systems –

- Uterus: Increase in weight, volume, and growth (hypertrophy > hyperplasia).
- Ligaments: Stretching round ligament pain.

- Signs: Osiander, Chadwick, Goodell, Hegar, Piskacek.
- Circulation: Uterine souffle, funic souffle.
- Fetus: Fetal heart sounds are detectable by Doppler and stethoscope.
- Skin: Pigmentary changes – linea nigra, chloasma, secondary areola.
- Breast: Secondary areola pigmentation and Montgomery tubercles.

DETAIL QUESTION

Q5.1. What are the changes in weight and volume of the uterus during pregnancy?

Answer:

- Gravid uterus at term weighs about 1100 gm
- Volume of cavity of pregnant uterus at term ~5 liters (can expand up to 20 liters)

Q5.2. What is the mechanism of uterine growth in pregnancy?

Answer: Growth mainly due to myometrial hypertrophy > hyperplasia

- Most hyperplasia occurs in 1st trimester
- Hyperplasia is an estrogen-related change

Q5.3. What is round ligament pain in pregnancy?

Answer: Sharp stabbing pain in the groin

- Occurs as uterus grows in size
- Seen mostly in 2nd trimester
- Especially with sudden jerky movements
- More often on right side > left side (due to stretching of ligaments) Round ligament pain.

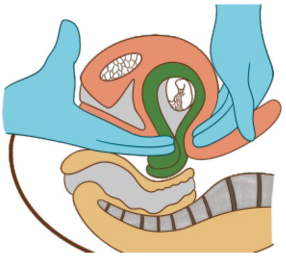
Q5.4. What is the treatment of round ligament pain?

Answer:

- Conservative management
- Avoiding sudden jerky movements
- If needed, antispasmodics can be prescribed

Q5.5. What are the important signs seen in pregnancy?

Answer:

Sign	Description
Osiander sign	↑ blood flow in uterine artery, pulsations felt through lateral vaginal fornix
Chadwick/ Jacqueimier sign	↑ vascularity and bluish hue of vagina
Goodell sign	Softening of cervix
Hegar sign	Softening of isthmus 

Q5.6. What other important signs are noted in pregnancy?

Answer:

- Palmar sign → Rhythmic uterine contractions
- Piskacek sign → Lateral implantation and unequal enlargement of uterus
- Majority of signs seen around 8 weeks of gestation
- Goodell sign and Hegar sign appear as early as 6 weeks

Q5.7. What are the important auscultatory changes in pregnancy?

Answer:

Findings	Description
Uterine souffle	• Soft, blowing sound heard over sides of uterus • Produced by blood flow across dilated uterine artery • Synchronous with maternal pulse
Funic souffle	• Produced by blood flow across umbilical artery • Synchronous with FHR (fetal heart rate)

Q5.8. When can fetal heart sounds (FHS) be heard in pregnancy?

Answer:

- By hand-held Doppler: earliest at 10 weeks
- By ordinary stethoscope: earliest at 18-20 weeks

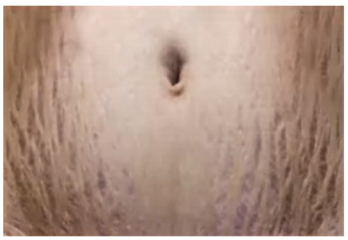
Q5.9: What are the common pigmentary changes seen in pregnancy?

Answer:

- **Linea nigra:** Line of pigmentation extending from umbilicus to pubic symphysis.
- **Chloasma/Melasma:** Pigmentary changes over forehead, nose, and malar area.
- **Secondary areola:** Darkening of breast areola.
- **Cause:** Hormone-related, mainly estrogen → melanocyte-stimulating hormone (MSH); progesterone also plays a role.



Linea nigra



Striae gravidarum

Q5.10: What breast changes are seen in pregnancy related to pigmentation and glands?

Answer:

- **Secondary areola:** Increased pigmentation around nipples.
- **Montgomery tubercles:** Hypertrophied sebaceous glands in the breast.

BIG QUESTION 6: What are the physiological changes in circulatory and respiratory system in pregnancy ?

Broad Answer: Pregnancy causes major circulatory and respiratory adaptations to support maternal and fetal needs. Key changes include ↑blood volume, ↑CO, ↓PVR, physiological hemodilution, edema, and compensated respiratory alkalosis.

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DETAILED QUESTIONS

Q6.1: How does blood volume change in pregnancy?

Answer:

- Blood volume ↑ by ~40-50%
- Plasma volume ↑
- RBC mass ↑ by 20-30% (due to Estrogen stimulating erythropoietin)
- Water retention ~6 liters
  - 3.5 liters → placenta, fetus, amniotic fluid
  - Remaining → plasma volume, breast tissue, uterus
- **Hemodilution** → Plasma volume increase > RBC mass

Q6.2: What happens to oxygen-carrying capacity and metabolism in pregnancy?

Answer:

- Oxygen carrying capacity ↑
- Oxygen consumption ↑
- Basal metabolic rate (BMR) ↑ by ~20%

Q6.3: What are the cardiac changes in pregnancy?

Answer:

- Cardiac output (CO), heart rate (HR), stroke volume (SV) ↑
  - CO ↑ by 40-50% on average
  - CO starts ↑ by 5 weeks, peaks at 28-32 weeks → returns to normal by 10 days postpartum
- Ejection fraction (EF), central venous pressure (CVP), and pulmonary capillary wedge pressure (PCWP) remain the same
- CO maximum/risk of heart failure maximum:
  - Immediate postpartum > intrapartum > 28-32 weeks
- CO ↑ further with uterine contractions and after placental delivery

Q6.4: How does blood pressure change in pregnancy?

Answer:

- Dizziness in the late 2nd trimester due to BP fall
- Nadir ~24-26 weeks, then rises back to pre-pregnancy levels
- Peripheral vascular resistance ↓

Q6.5: What is supine hypotension syndrome?

Answer:

- At term, CO lowers in supine position due to IVC compression by gravid uterus (slightly dextro-rotated) → Supine hypotension syndrome
- Best position in pregnancy: Left lateral position → better CO, placental perfusion, tissue perfusion
- During C-section → maintain slight left lateral tilt (wedge under right hip or tilt OT table)

Q6.6: What are the causes of physiological edema in pregnancy?

Answer:

- Venous pooling in lower limbs

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- Compression of iliac veins by gravid uterus
- Hypoproteinemia (serum protein concentration ↓ due to hemodilution, though total protein amount ↑)

Q6.7: What are the features of physiological edema in pregnancy?

Answer:

- Relieved after rest
- Mild pitting, limited to ankles only
- If edema extends up to the knee, anasarca, non-pitting, or does not subside after rest pathological cause

Q6.8: What are the respiratory changes in pregnancy?

Answer:

- ↑ Awareness of breathing
- Respiratory rate → unchanged
- Inspiratory capacity ↑ (progesterone stimulates the respiratory center)
- Tidal volume ↑
- Minute volume ↑
- Diaphragm rises ~4 cm → respiratory discomfort
- Residual volume, Functional residual capacity (FRC), Expiratory reserve volume (ERV) ↓
- Vital capacity (VC), lung compliance → unchanged
- Total lung capacity (TLC) → unchanged / slightly lower

Q6.9: What acid-base changes occur in pregnancy?

Answer: Pregnancy → state of compensated respiratory alkalosis

- Blood pH normal (slightly high)
- Kidneys compensate by ↑ bicarbonate excretion → serum bicarbonate levels slightly

BIG QUESTION 7: What are the physiological changes in pregnancy - physical examination, renal system, and gastrointestinal system?

Broad Answer: Pregnancy causes normal physical, renal, and gastrointestinal changes. Some findings are physiological, while others require evaluation.

DETAILED QUESTIONS

Q7.1: What physiological changes are seen on physical examination in pregnancy?

Answer:

- Apex beat in 4th ICS, lateral to mid-clavicular line (heart moves up & out)
- Straightening of the left heart border
- Loud heart sounds
- Exaggerated split S1, S3
- Ejection systolic murmur up to grade 2 is normal
- Abnormal findings that require evaluation:
  - Cardiomegaly
  - Any diastolic murmur
  - Ejection systolic murmur grade ≥3
  - Split S2, S4

- ECG: Slight left axis deviation (~15°) can be normal
- Mammary murmur - physiological, due to increased breast blood flow

Q7.2: What are the renal changes in pregnancy?

Answer:

- Increased frequency of micturition, polyuria, and nocturia (due to increased renal blood flow and GFR)
- Serum creatinine decreases
- Uric acid decreases
- Glucosuria may be normal but always rule out GDM
- Significant proteinuria ≥300 mg/day

Q7.3: What level of serum creatinine in pregnancy suggests renal pathology?

Answer: Serum creatinine ≥0.9 mg/dl

Q7.4: What anatomical or functional changes predispose to urinary issues in pregnancy?

Answer:

- Ureteral compression by gravid uterus at pelvic brim (right > left)
- Progesterone-mediated smooth muscle relaxation → hydroureteronephrosis (slightly more on right)
- Increased predisposition to urinary tract infection

Q7.5: How is asymptomatic bacteriuria managed in pregnancy?

Answer:

- Incidence: ~5-7% (similar to non-pregnant women)
- If untreated → risk of ascending infection → symptomatic UTI → pyelonephritis
- Diagnosis: Urine culture >10^5 CFU/ml (most common organism = E. coli)
- Treatment: Nitrofurantoin (empirical therapy)

Q7.6: What gastrointestinal changes occur in pregnancy?

Answer:

- Due to progesterone-induced smooth muscle relaxation and diaphragm elevation:
  - Heartburn
  - Constipation
  - Reduced gall bladder contractility
- Liver enzyme changes:
  - AST and ALT decrease (hemodilution)
  - ALP increases (placental alkaline phosphatase)
- Gastric emptying time:
  - Unchanged in pregnancy
  - Decreased in labor → hence women in active labor kept on clear fluids for anesthesia safety in case of C-section

BIG QUESTION 8: What are the features of physiological anemia of pregnancy and glandular-hormonal changes during pregnancy?

Broad Answer: Physiological anemia occurs due to increased iron demand and hemodilution, while glandular-hormonal changes include altered calcium metabolism, thyroid adjustments, insulin resistance, and pituitary-adrenal

modifications to support pregnancy.

Q8.1: What hematological state is pregnancy considered and how do clotting factors change?

Answer: Pregnancy is a hypercoagulable state All clotting factors increase except Factor XI and Factor XIII.

Q8.2: What changes are seen in fibrinogen, ESR, platelet count, and TLC during pregnancy?

Answer:

- Fibrinogen: ↑ ~50% → causes ↑ ESR.
- Platelets: Mild ↓.
- TLC: ↑, upper value ~15,000/mm^3.

Q8.3: What happens to coagulation times and anticoagulant proteins during pregnancy?

Answer:

- aPTT, PT, BT, CT: Remain within normal limits.
- **Activated protein C resistance:** ↑.
- **Protein S and antithrombin levels:** ↓.

Q8.4: What is the total iron requirement in pregnancy and its distribution?

Answer:

- Total iron requirement: ~1000 mg.
  - 300 mg → fetus & placenta.
  - 200 mg → obligatory iron loss.
  - 500 mg → expansion of maternal RBC mass.
- Daily requirement (2nd half of pregnancy): 6-7 mg/day.

Q8.5 What is the cause and timing of physiological anemia in pregnancy?

Answer:

- Cause: ↑ iron requirement + hemodilution
- Starts 7-8 weeks → peaks at 32 weeks

Q8.6 What are the hematological changes?

Answer:

Hb concentration and Hct	↓
Serum iron	↓
Serum ferritin	↓
TIBC	↑
MCV	↑ (minimally)
MCHC	Remains same

Q8.7 What is the lowest Hb in physiological anemia?

Answer:

- Hb does not fall below 11 g/dl
- If <11 → considered pathological anemia

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Q8.8 What is the supplementation guideline (Anemia Mukt Bharat)?

Answer:

- 60 mg elemental iron + 500 µg folic acid
- 1 tablet OD × 180 days (antepartum + postpartum)
- Start from 14 weeks (2nd trimester)

Q8.9 Does severe maternal iron deficiency cause fetal anemia?

Answer:

- No fetal anemia occurs
- But → newborn may have reduced iron stores

Q8.10 What happens to calcium metabolism in pregnancy?

Answer:

- ↑ Calcium absorption from gut (↑ 1,25 Vitamin D)
- Total calcium ↓ (low-bound fraction due to hypoproteinemia)
- Ionized calcium → normal

Q8.11 What are the metabolic changes (glucose & fat)?

Answer:

- Pregnancy = diabetogenic state (insulin resistance ↑)
- Postprandial hyperglycemia + fasting hypoglycemia
- Accelerated starvation →↑ free fatty acids, glucose diverted to fetus.
  - Prolonged fasting/vomiting → risk of ketosis & ketonuria

Q8.12 What are the thyroid changes in pregnancy?

Answer:

- Thyroid hormones & TBG ↑
- Iodine requirement ↑ (250 µg/day)
- Fetal thyroid hormone production starts ~12 weeks
  - Before 12 weeks, → fetus depends on maternal thyroid
- Total T3 & T4 ↑
- Free T3 & T4 → unchanged
- TSH ↓ in 1st trimester, then rises, but stays lower than non-pregnant

Q8.13 What is the reference limit of TSH in pregnancy?

Answer:

- 1st trimester → 2.5 mIU/L
- 2nd & 3rd trimester → 3.0 mIU/L
- Above these values: Elevated

Q8.14 What are the key thyroid clinical points?

Answer:

- Any goiter in pregnancy = abnormal → evaluate
- Hypothyroid women on levothyroxine → need increased dose

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Q8.15 What happens to pituitary, spleen, and adrenal glands?

Answer:

- Pituitary size ↑ ~135%
- Spleen size ↑
- Adrenal gland size unchanged → but cortisol production

Brief Question 9: What are the key pregnancy-related aspects regarding nausea, vomiting, hyperemesis, obstetric score, EDD, USG, and antenatal care?

Broad Answer:

- Nausea & vomiting: Peaks 8-10 wks, subsides by 16 wks; 1st line drug - Doxylamine + Pyridoxine.
- Hyperemesis gravidarum: Severe vomiting → weight loss, dehydration, electrolyte imbalance; managed with IV fluids, thiamine, antiemetics.
- Obstetric score: Calculated by the GTPAL system.
- EDD: Naegele's formula = LMP + 9 months + 7 days; IVF = fertilization date + 266 days.
- USG: Earliest sign - gestational sac; most accurate dating - CRL (1st trimester).
- ANC: GOI recommends 4 visits; WHO - 8 contacts; TIFA scan at 18-20 wks.

Q9.1: What are the features of nausea and vomiting in pregnancy?

Answer:

- Peaks at 8-10 weeks.
- Subsidies by 16 weeks in most.
- Exacerbated with:
  - Multiple pregnancy
  - Molar pregnancy
  - Hyperthyroidism
  - Diabetes Mellitus (DM)
  - Gastroesophageal reflux disease (GERD)

Q9.2: How is nausea and vomiting in pregnancy managed?

Answer:

- Mild cases → Diet adjustment.
- First-line drug: Doxylamine + Pyridoxine (Vitamin B6).
- Second-line drugs:
  - Promethazine
  - Metoclopramide
  - Ondansetron

Q9.3: What is hyperemesis gravidarum and its complications?

Answer:

- Severe vomiting leading to:
  - Weight loss
  - Dehydration
  - Alkalosis followed by acidosis
  - Hypokalemia
  - Ketonuria/ketosis
- If hospitalized:

- Parenteral antiemetics + IV fluids + electrolyte replacement with Thiamine (Vitamin B1)
- Complication: Vitamin B1 deficiency → Wernicke's encephalopathy

Q9.4: How is the obstetric score calculated?

Answer:

- G (Gravida): Total pregnancies, irrespective of outcome.
- P (Parity): Pregnancies beyond 20 weeks.
- L (Living): Number of living children.
- GTPAL formula:
  - G = Gravida
  - T = Term deliveries
  - P = Preterm deliveries
  - A = Abortions
  - L = Living children

Examples	
Woman pregnant now, h/o: Vaginal delivery at 8 months (child died after 7 days). Term vaginal delivery (child healthy). **Answer:** G3P2L1 → G3P(1-1-0-1).	**Woman 2nd pregnancy, h/o:** Twin vaginal delivery at 8 months (both healthy). **Answer:** G2P1L2 → G2P(0-1-0-2).

Q9.5: How is the Expected Date of Delivery (EDD) calculated?

Answer: 40 completed weeks (~280 days) from 1st day of LMP → Only 5% deliver exactly on EDD.

Time Periods	• Preterm < 37 weeks • Early preterm < 34 weeks • Late preterm = 34-37 weeks • Term = 37 to 41+6 weeks • Post-term ≥ 42 weeks
Naegele's formula	• LMP + 9 months + 7 days. • Reliable only if: o Sure LMP, regular cycles, no hormonal contraceptives in last 6 months. • Short cycles → subtract days. • Long cycles → add days.
IVF cycles	• EDD = Date of fertilization (oocyte retrieval) + 266 days.

Q9.6: What are the ultrasound findings in early pregnancy?

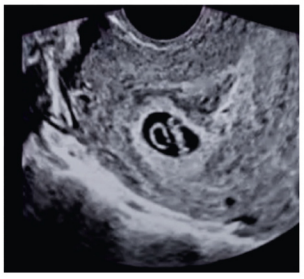
Answer:

Earliest finding: Gestational sac (true sac).	**Earliest definitive sign:** Double bleb sign (yolk sac inside gestational sac/chorionic cavity).
True sac features: • Eccentric in location • Smooth margin • Double decidual sac sign (decidua parietalis + decidua capsularis)	

TAS (Transabdominal):	TVS (Transvaginal):
• G-sac: 5 weeks	• G-sac: 4 weeks + 1-3 days
• Cardiac activity: 6-7 weeks	• Cardiac activity: 5-6 weeks



Double decidual sac sign

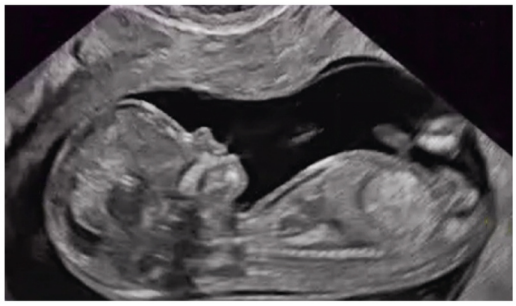


Double bleb sign

Q9.7: How is gestational age estimated by ultrasound?

Answer:

- Best method: Ultrasound (if LMP not reliable).
- Earlier the scan, the more accurate.
- Parameters:
  - o 1st trimester (7-9 weeks): Crown Rump Length (CRL)
  - o 2nd trimester (>14 weeks): Biparietal Diameter (BPD)
  - o 3rd trimester: Femur Length (FL)
- Abdominal circumference (AC): reflects fetal growth.
- Routine must-do scan: TIFA (Targeted Imaging for Fetal Anomalies) Level II, at 18-20 weeks.



Q9.8: What are the ANC visit recommendations?

Answer:

- GOI: Minimum 4 visits.
- WHO: 8 antenatal contacts.

Q9.9: How is fundal height assessed in pregnancy?

Answer: SFH (Symphysio-fundal height): 24-36 weeks → SFH in cm ≈ Gestational age in weeks (±3 cm).

Fundal Height	Weeks
Just above pubic symphysis	12 weeks
Midway between symphysis and umbilicus	16 weeks
At level of umbilicus	24 weeks
At level of xiphisternum	36 weeks
Term size uterus	32 weeks with flanks full

Q9.10: What causes discrepancy in fundal height and POG?

Answer:

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FUNDAL HEIGHT >POG (chekck for wrong dates)	FUNDAL HEIGHT <POG (chekck for wrong dates)
Full bladder	Fetal growth restriction
Molar pregnancy	Fetal death
Multiple pregnancy (atleast 2 fetal poles on per abdomen examination/auscultation of 2 fetal heart sounds atleast with difference of 10 cm/10 beats/min)	transverse lie
Polyhydramnios	Oligohydramnios

Big Question 10: What are the key aspects of antepartum fetal surveillance and immunization in pregnancy?

Broad Answer:

- **Fetal surveillance:** Quickening at 20 wks; starts >32 wks; methods include kick count, NST, BPP, and modified BPP.
- **Biophysical profile (BPP):** NST + USG parameters (breathing, body movement, tone, AFI).
- **Interpretation:** Score 8-10 reassuring, ≤ 4 plan delivery, 6 equivocal.
- **Immunization:** Td/Tdap, influenza, and COVID-19 recommended; live vaccines contraindicated.

DETAILED QUESTIONS

Q10.1: When is quickening felt and when does fetal surveillance usually begin?

Answer:

- Quickening: First perception of fetal movement by mother → around 20 weeks (5th month).
- Fetal surveillance usually starts after 32 weeks (fetal sleep-wake cycle more organized).

Q10.2: What is the Cardiff "Count to 10" method?

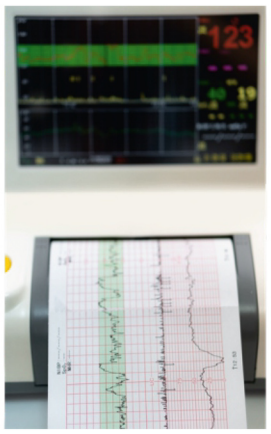
Answer: 10 fetal movements in 2 hours reassuring.

Q10.3: What are the features of a normal Non-Stress Test (NST)?

Answer:

- Baseline FHR: 110-160/min.
- Beat-to-beat variability: Present (due to sympathetic + parasympathetic influence).
- With fetal movement →transient rise in FHR above baseline.

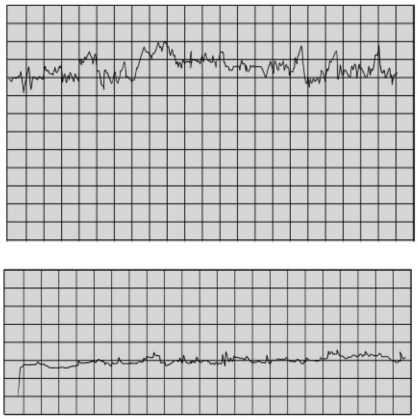




Q10.4: What defines a Reactive NST?

Answer:

- At least 2 accelerations in 20 minutes,
- Each acceleration: >15 bpm above baseline, lasting ≥ 15 sec.
- If non-reactive → extend test up to 40 minutes before labelling.



Q10.5: What is a Modified Biophysical Profile (BPP)?

Answer: Combines:

- NST → current fetal status.
- Amniotic fluid index (AFI) → chronic uteroplacental sufficiency.

Q10.6: What are the components of a Complete Biophysical Profile (BPP / Manning score)?

Answer: Mnemonic - "No Baby Movement Today"

- N → NST (20 min).
- USG done (30 minutes) to look for
  - B → Fetal breathing movements (11 weeks).
  - M → Gross body movements - spontaneous (8-9 weeks)
  - T → Tone (flexion/extension).
  - A → Amniotic fluid volume (2 × 2 cm pocket).

Q10.7: How is the BPP score interpreted?

Answer:

- 10/10 or 8/10 → reassuring.
- ≤ 4/10 → plan delivery.
- 6/10 → equivocal → repeat test.
- Sensitivity to predict cord pH/fetal acidemia is poor.

Q10.8: What is the approach when a patient complains of decreased fetal movements?

Answer:

- Note gestational age.
- Perform examination for maternal and fetal status.
- Perform NST → Modified BPP → Full BPP if abnormal.

Q10.9: What is the routine immunization schedule in pregnancy?

Answer:

- Td/Tt vaccine (0.5 ml IM):
  - o 1st dose → early in pregnancy.
  - o 2nd dose → at least 4 weeks later.
  - o If pregnancy occurs within 3 years of previous → only booster dose.
- If missed in the antepartum period → give postpartum.

Q10.10: What are the current international recommendations for vaccination in pregnancy?

Answer:

- **Tdap:** Every pregnancy, irrespective of prior vaccination (preferably at 27-36 wks).
- **Influenza (inactivated):** One dose IM.
- **COVID-19 vaccine:** Recommended.

Q10.11: Which vaccines are considered safe during pregnancy, and which are contraindicated?

Answer:

Vaccine C/I	Vaccines that are safe
• MMR, Varicella, Live influenza • Polio, cholera, typhoid • Can be given in special circumstances like travelling to endemic area - yellow fever, Japanese encephalitis • At level of xiphisternum	• Hepatitis A and B • Pneumococcal and Meningococcal • Inactivated vaccines • Postexposure rabies vaccine

Q10.12: What are the special considerations for MMR vaccination in women?

Answer:

- Ideally, given pre-pregnancy.
- Avoid conception for at least 1 month after vaccination.
- If accidentally given during pregnancy → not an indication for MTP.
- Susceptible women (unvaccinated & pregnant) → vaccinate postpartum.

9. EARLY PREGNANCY COMPLICATIONS

BIG QUESTION 1: What is abortion and how is it defined clinically?

Broad Answer: Abortion is defined as the termination of pregnancy before 20 weeks of gestation or the expulsion of a fetus weighing less than 500 g. It may occur spontaneously or be induced, with spontaneous abortion being most common in the first trimester.

DETAILED QUESTIONS

Q1.1: What is the most common cause of spontaneous abortion?

Answer:

- Embryonic chromosomal abnormalities
- Most common: Aneuploidies > Trisomies > Trisomy 16 > Monosomy X > Triploidy

Q1.2: What is the overall incidence of spontaneous abortion?

Answer:

- About 10-15% (majority in 1st trimester)
- Most important risk factor: Increasing age of women

Q1.3: What is the most common trisomy and individual anomaly responsible for abortions?

Answer:

- Trisomy: Trisomy 16
- Individual anomaly: Monosomy X

Q1.4: Which structural uterine anomalies typically cause 2nd trimester abortions?

Answer:

- Congenital (septate, bicornuate uterus)
- Acquired (submucosal fibroids, uterine synechiae)
- Cervical incompetence

Q1.5: What are the clinical presentations of different types of abortions?

Answer:

Features	Threatened Abortion	Inevitable Abortion	Incomplete Abortion	Complete Abortion
Symptoms	Spotting Mild BPV Pain +/-	BPV + Pain +	BPV + Pain +	H/o BPV and Pain (now stopped) Passage of fleshy mass
Vitals	Stable	Stable/unstable	Stable/unstable	Stable/unstable
Uterus size	Corresponds to period of gestation	Corresponds to period of gestation	< Period of gestation	<< Period of gestation
Cervix os	Closed		Open/Closed	Closed

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TVS	Fetus/embryo inside Cardiac activity +	Fetus/embryo inside Cardiac activity +/-	Retained products of conception +	Empty uterus
Management	Conservative	Let it progress	Evacuation of uterus	No evacuation needed

Q1.6: A 32-year-old G2A1 with 8 weeks of amenorrhea, light P/V bleeding & pain in lower abdomen. On P/S exam, the os is closed. TVS reveals a single live intrauterine pregnancy corresponding to 8 weeks of gestation with a small subchorionic bleed. What is the preferred management?

A. Dilatation and curettage

B. Misoprostol

C. Bed rest and progesterone

D. Beta HCG injection

Answer: C. Bed rest & Progesterone

- In abortions, bleeding occurs first, followed by pain
- **Subchorionic bleed:** Bleeding into decidua basalis
- **Management of threatened abortion:** Bed rest & Progesterone
  - Bed rest: Avoid exertion, intercourse, and heavy activity
  - No evidence-based role of progesterone
  - Previous h/o miscarriage: Vaginal micronized progesterone

Q1.7: A 29-year-old G2P1 presents to emergency at 10 weeks with painful vaginal bleeding. Her PR is 110/min, BP is 90/65 mmHg. Large blood clots are evacuated during P/V exam, and active bleeding is seen from the open cervical os. Bedside USG reveals a 9-week fetus in the lower uterine segment with no cardiac activity. What is the preferred management?

A. Resuscitation and expectant management

B. Administer oxytocin

C. Administer misoprostol

D. Suction and evacuation

Answer: D. Suction and evacuation

- Management of inevitable abortion in unstable patient: Resuscitation + Suction and evacuation

BIG QUESTION 2: What is septic abortion and how is it diagnosed and managed?

Broad Answer: Septic abortion is an infection of the uterus and its contents, most commonly following unsafe abortion practices. It typically occurs in the presence of retained products of conception and is usually due to ascending polymicrobial infection. Management includes intravenous broad-spectrum antibiotics and uterine evacuation when retained products are present

DETAILED QUESTIONS

Q2.1: What is the most common cause of septic abortion?

Answer:

- Unsafe abortion
- Most common in setting of retained products (incomplete abortion)
- Most common: Ascending infection (polymicrobial)

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Q2.2: What is the management of septic abortion?

Answer:

- Broad-spectrum antibiotics (IV)
- Evacuation of uterus (if retained products of conception present)

Q2.3: A woman attends emergency, 6 weeks amenorrhea with heavy vaginal bleeding & lower abdominal cramps for 4 hours. There is h/o fleshy mass from vagina in the toilet. There is no bleeding & pain now. UPT at home was positive. USG shows an empty uterus with thin endometrium, and adnexa normal. What should be done next?

A. Reassure and send home

B. Send serum beta hCG

C. Admit for suction and evaluation

D. Follow-up after 1 week

Answer: B. Send serum beta hCG

- Repeat Beta hCG after 48 hours (>50% fall in complete abortion)

Q2.4: When is confirmation of complete abortion established?

Answer:

- Prior USG report documenting intrauterine pregnancy & later empty uterus
- True products of conception seen grossly
- In unclear settings, serial serum beta-hCG & clarification

Q2.5: A woman is seen at 12 weeks gestation with complains of mild spotting and off-and-on cramping, lower abdominal pain. TVS reveals an intrauterine gestational sac corresponding to 5 weeks of gestation with no fetal pole inside and closed cervical os. What is the most likely diagnosis?

A. Threatened abortion

B. Incomplete abortion

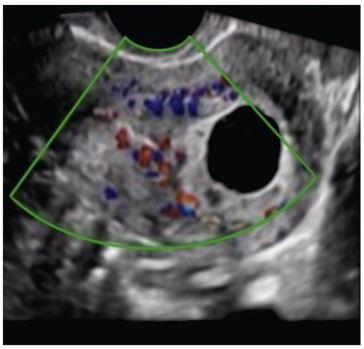
C. Missed abortion

D. Inevitable abortion

Answer: Missed abortion

BIG QUESTION 3: What is a missed abortion and how is it diagnosed and managed?

Broad Answer: Missed abortion is a type of early pregnancy loss where the embryo or fetus is non-viable but remains in the uterus, usually within the first 12 weeks. It is most often caused by embryonic chromosomal abnormalities. Diagnosis is primarily made by transvaginal sonography (TVS) using specific cut-offs for mean sac diameter (MSD) and crown-rump length (CRL) without cardiac activity. Management involves uterine evacuation, either medically or surgically.



DETAILED QUESTIONS:

Q3.1: What are the transvaginal sonography (TVS) findings of a missed abortion?

Answer: TVS findings of missed abortion are

- Mean sac diameter (MSD) ≥ 25mm & no embryo
  - Previously known as: Anembryonic pregnancy/Blighted ovum
- CRL ≥ 7mm & no cardiac activity

Q3.2: What is the typical pregnancy duration for a missed abortion?

Answer:

- Non-viable intrauterine pregnancy within 1-12 weeks
- Symptoms of pregnany subside, size of uterus smaller than POG, os closed

Q3.3: What is the most common cause of missed abortion?

Answer: Embryonic chromosomal abnormalities

Q3.4: A primigravida has come at 6 weeks of gestation with a dating scan. On TVS, a uniform gestational sac with a yolk sac is seen, along with a fetal pole, at a CRL of 7mm, but no cardiac activity is observed. What is the next step?

A. It is a failed pregnancy

B. High probability of non-viable pregnancy, repeat scan after 7 days

C. High probability of viable pregnancy, repeat scan after 7 days

D. Give progesterone therapy

Answer: B. High probability of non-viable pregnancy, repeat scan after 7 days.

Q3.5: A primigravida has come at 6 weeks of gestation with a dating scan. On TVS, a uniform gestational sac with a yolk sac is seen along with a fetal pole, at a CRL of 7mm, but no cardiac activity is observed. What is the next step?

Answer: High probability of non-viable pregnancy, repeat scan after 7 days.

BIG QUESTION 4: What is recurrent pregnancy loss and how is it evaluated?

Broad Answer: Recurrent pregnancy loss (RPL) is traditionally defined as ≥ 3 pregnancy losses, though evaluation should begin after ≥ 2 confirmed losses (by USG or histopathology).

The most common cause is idiopathic, often linked to embryonic chromosomal abnormalities. Other causes include uterine anomalies, endocrine disorders, and antiphospholipid antibody syndrome (APLA).

Evaluation involves uterine imaging (TVS), hormonal work-up, immunological testing, and parental karyotyping. Risk of recurrence increases with the number of prior pregnancy losses.

DETAILED QUESTIONS

Q4.1: What is the most common cause of recurrent pregnancy loss?

Answer:

- Idiopathic
- Age >35 yeas, repeated anembryonic pregnancy losses → Most likely cause is repeated embryonic chromosomal abnormalities.
- Uterine structural anomalies: More likely associated with 2nd trimester pregnancy loss

Q4.2: What are the recommended tests for recurrent pregnancy loss?

Answer:

- Evaluation of uterus → Preferably TVS
- Testing for APLA
- Serum TSH and Anti-TPO antibodies
- HbA1c and FBS
- Parental karyotyping
  - Look for balanced reciprocal translocation (most common) in either parent
    → Least common cause of recurrent pregnancy loss
- **Not recommended testing:**
  - TORCH testing
  - Thrombophilia testing

Q4.3: What is the risk for subsequent pregnancy loss?
Answer:

After 2 consecutive losses	24%
After 3 consecutive losses	30%
After 4 consecutive losses	40-50%

Q4.4: A 27-year-old woman has a history of 2 prior spontaneous abortions, one at 10 weeks and other at 15 weeks of gestation. Each time USG had shown cardiac activity in the fetus. Her 1st pregnancy was complicated with severe pre-eclampsia at 28 weeks. What is the most likely diagnosis?

A. Endocrinological abnormalities
B. Syphilis
C. APLA
D. Uterine structural anomalies

Answer: C. APLA (Antiphospholipid Antibody)

- Syphilis usually causes stillbirth but can also cause abortion

Q4.5: What is the criteria for APLA (Modifies Sapporo Criteria) required to make diagnosis?
Answer:

Criteria for APLA (Modifies Sapporo Criteria)	
Clinical criteria	• ≥ 1 unexplained death of morphologically normal fetus at/beyond 10 weeks • H/o severe preeclampsia/placental insufficiency with delivery < 34 weeks • ≥ 3 unexplained consecutive spontaneous abortions before 10 weeks • ≥ 1 episode of arterial, venous or small vessel thrombosis in any tissue
Lab criteria	Done on 2 occasions, atleast 12 weeks apart, ideally and preferably done when not pregnant • Lupus anticoagulant (Dilute Russell viper venom test) • Anticardiolipin (raised levels in medium/high titres) • Anti-β2 glycoprotein 1 (raised levels in medium/high titres)
Diagnosis: 1 Clinical criteria + 1 Lab criteria	

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Q.4.6: What are the APTT and PT findings in APLA?

Answer:

- aPTT: Prolonged
- PT: Usually normal

Q4.7: What is the management of APLA?

Answer:

- TOC: Low molecular weight heparin + Low dose aspirin
  - o Prophylaxis (throughout pregnancy)
  - o Not a treatment for idiopathic recurrent pregnancy loss
- 2nd line treatment: IV immunoglobulins & plasmapheresis

BIG QUESTION 5: What are the features of cervical insufficiency?

Broad Answer:

- Recurrent preterm births and/or 2nd trimester pregnancy losses with a history of progressively earlier gestational timing
- History of sudden, spontaneous, painless expulsion of fetus

DETAILED QUESTIONS

Q5.1: How is cervical insufficiency diagnosed?

Answer:

- Classical history + TVS measurement of:
  - o Cervical length < 25mm (16-24 weeks)
  - o Internal os open > 1cm, funneling of internal os

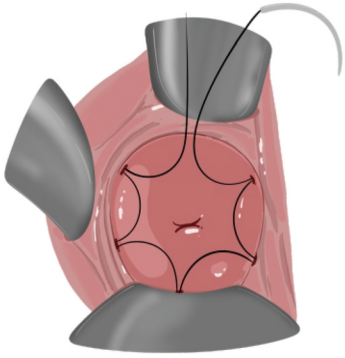
H/o ≥ 3 RPL	H/o 1/2 RPL
• History-indicated cerclage • At 12-14 weeks	• Cervical length monitoring TVS • USG-indicated cerclage • Before 24 weeks

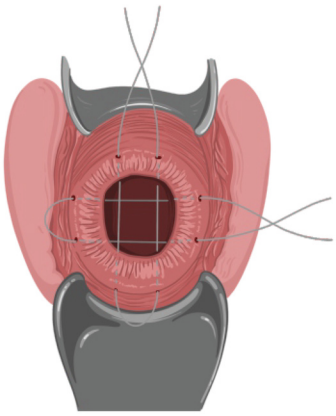




Q5.2: What are various techniques for cervical cerclage?

Answer: Techniques are:

Techniques	Description
McDonald's Cerclage	Vaginal procedure 

Wurm's Suture or Hefner's Cerclage	• H/o cervical insufficiency, os open and +/- bulging membranes • If cerclage is attempted → Rescue cerclage • Can be done till 24 weeks 
Benson & Durfee Cerclage	• Abdominal cerclage done if prior failed vaginal cerclage • Done for very short cervix • Can be done before/during pregnancy
Lash & Lash Cerclage	• Vaginal cerclage procedure • Can only be done in non-pregnant state

Q5.3: What are the contraindications for cervical cerclage?

Answer:

- Abnormal fetus
- Bleeding or leaking, absent membranes
- Uterine contractions
- Infections

Q5.4: When to remove cerclage?

Answer:

- Once 37 weeks completed
- If in labor, bleeding PV, or leaking PV

BIG QUESTION 6: What is the management of induced abortion?

Broad Answer:

- **Medical method**
  - **1st trimester:** Till 9 weeks of gestation (Government of India)
  - **2nd trimester:** Beyond 12 weeks and < 24 weeks of gestation
- **Surgical method**
  - **1st trimester methods:**
    - → Vacuum aspiration methods
    - → Dilatation & curettage

DETAILED QUESTIONS

Q6.1: What is the medical management of induced abortion?

Answer:

- **1st trimester:** Mifepristone **(200mg)** - Oral

- Followed by Misoprostol **800µg** 48 hours later
- Sublingual (preferred)/per vaginal/buccal
- Oral route recommended by GOI only if <7 weeks of gestation.

- **2nd trimester:** Mifepristone **200mg** - Oral
  - 48 hours later →**Misoprostol 400mg** every 3 hours until expulsion (maximum 5 doses in 24 hours).

Q6.2: What is the best method for 2nd trimester MTP?

Answer:

- Medical method (PGE1)
- Misoprostol alone can also be used

Q6.3: What syndrome and congenital defect are associated with misoprostol use?

Answer: Limb defects & Mobius syndrome

Q6.4: What is the sequence of steps in surgical management of induced abortion?

Answer:

- Note position and size of uterus
- Cervical dilatation
- Evacuation of uterus
- Note completion of procedure

Q6.5: What are the signs of empty uterus?

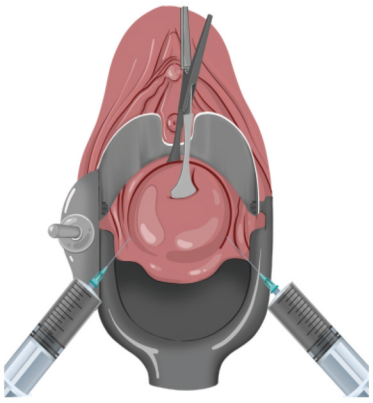
Answer:

- No more tissue, pink bubbles coming out
- Uterus gripping suction cannula
- Grating sensation felt

Q6.6: What is a paracervical block in surgical management?

Answer:

- Given during surgical evacuation
- Given at 8 O'clock, 4 O'clock, and 6 O'clock positions
- Should not be given at 9 O'clock and 3 O'clock positions
  - Descending cervical artery is located in these positions



Q6.7: What is MVA and menstrual regulation syringe?

Answer:

MVA (Manual Vacuum Aspiration) Syringe	Menstrual Regulation Syringe
• Capacity: 60mL • Suction pressure: 660 mmHg • Used till 12 weeks of gestation • Karman cannulas used (plastic disposable cannulas with openings on 2 ends). • MVA syringe: 2 valves	• Has 1 valve • Capacity: 50mL • Can be used till 6 weeks of gestation





Q6.8: What are other instruments used in surgical methods of MTP?

Answer:

Instrument	Description	Image
Metallic Cervical Dilators	• Hawkin Ambler's dilator • Hegar's dilator	
Uterine Curette	Used for uterine curettage	
Uterine Sound	• Markings present in centimeters to measure uterocervical length • Direction of introducing uterine sound indicates anteverted/retroverted uterus	
Ovum Forceps	• No latch • Has cup-like depressions • Used to grasp and remove contents inside uterine cavity	 

Q6.9: What is the size of cannula/dilator used?

Answer: Corresponding to the size of uterus in weeks

Q6.10: While performing suction & evacuation for an 8-week pregnancy, there is a sudden give-way feeling, and you realize that you might have perforated the uterus. Considering that the vitals of the woman are stable, what is the most appropriate next step?

Answer: Perform laparoscopy

- **Next step in perforation**
  - o Stop the procedure
  - o Inform senior
  - o Abdominal exploration
    - → If stable: laparoscopy
    - → If unstable: Laparotomy

- Perforation with dilator:
  - Stop the procedure
  - Inform senior
  - Observe vitals
  - Routine abdominal exploration is not mandatory

BIG QUESTION 7: What are the key provisions of the MTP Amendment Act, 2021?

Broad Answer: The MTP Amendment Act, 2021 expands access to safe abortion services by extending the gestational limit, specifying whose consent is valid, and clarifying requirements regarding medical opinions and documentation.

DETAILED QUESTIONS

Q7.1: According to the MTP Amendment Act, 2021, whose consent is considered most important?

Answer:

- Patient consent is most important - Consent form (Form C)
- If minor/unsound mind: Consent from guardian is taken
- Consent of husband/partner is not mandatory

Q7.2: Up to how many weeks of gestation is MTP permitted?

Answer:

- Allowed till 24 weeks of gestation in:
  - Survivors of rape/incest
  - Substantial fetal anomalies
  - Minors and mentally ill
  - Women with major physical disabilities
  - Change of marital status
- Allowed till 20 weeks for woman and her partener
  - Failure of contraception

Q7.3: How many medical practitioners' opinions are required to perform an MTP?

Answer:

- 1-20 weeks or first 20 weeks → Opinion of 1 Registered medical practitioner (RMP)
- 20-24 weeks → Opinion of 2 Registered medical practitioners (RMPs)

Q7.4: What is the course of action if substantial fetal anomalies are detected beyond 24 weeks of gestation?

Answer: MTP is allowed **ONLY** on approval by medical board

Q7.5: What additional documentation is required for performing an MTP?

Answer:

- No other documentation other than admission register
- Not required to record sex of abortus
- Records preserved for 5 years from date of last entry

BIG QUESTION 8: What is ectopic pregnancy and what are its major clinical considerations?

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Broad Answer: Ectopic pregnancy is defined as implantation of the fertilized ovum outside the uterine cavity, most commonly in the fallopian tube. It is an important cause of first-trimester morbidity and mortality. Clinical considerations include its sites of implantation, risk factors predisposing to it, clinical presentation, diagnostic methods, and management options.

DETAILED QUESTIONS

Q8.1: What is the most common site for ectopic pregnancy?

Answer:

- Tubal ectopic pregnancy is the most common.
- Site distribution: Ampulla > Isthmic

Q8.2: What is the most common risk factor for ectopic pregnancy?

Answer:

- Pelvic Inflammatory Disease (PID, salpingitis) is the most common risk factor.
- Maximum Risk:
  - History of prior tubal ectopic pregnancy
  - History of prior tubal surgeries
- Recurrence risk:
  - 1 prior ectopic → 10-15%
  - 2 prior ectopics → 30%

Q8.3: What factors are associated with an increased risk?

Answer:

- Smoking
- Infertility
- IVF
- Prior abdominal surgeries
- Failure of contraception (Tubal ligation > Mirena > IUD)
  - All contraceptives decrease absolute risk of ectopic pregnancy

Q8.4: What is the most common consequence of tubal ectopic?

Answer:

- Due to vascular insufficiency of embryo → Expelled through fimbrial end → Intraabdominal bleeding.

Q8.5: Which ectopic pregnancy is earliest to rupture?

Answer: Isthmic (6 weeks) > Ampullary (8 weeks)

- Last to rupture among tubal ectopics: Interstitial (12-16 weeks)
  - Interstitial part: Surrounded by uterine muscles in cornua region
  - If ruptured more bleeding → more dangerous

Q8.6: Which is the overall ectopic pregnancy to survive the longest?

Answer: Abdominal ectopics (rare)

Q8.7: A25-year-old woman with 2 months of amenorrhea is seen in the emergency with sudden lower abdominal pain and syncopal attack. On examination, the abdomen is soft and there is tenderness in the hypogastrium. There is no vaginal bleeding? What is your next step?

A. Do UPT

B. Send a serum beta-HCG

C. Perform TVS

D. Send serum progesterone

Answer: UPT (urine pregnancy test)

- Do UPT → In case of pregnancy → Perform TVS to know the location of pregnancy
- Decreased levels of progesterone: Seen in both pregnancy failure (abortion and ectopic)

Q8.8: What is the classic triad of tubal pregnancy?

Answer: Classic triad:

- Amenorrhea
- Pain
- Vaginal bleeding

Q8.9: What is the first step in tubal pregnancy?

Answer: Pregnancy test

Q8.10: Differentiate between ruptured and unruptured tubal ectopic pregnancy.

Answer:

Features	Unruptured	Ruptured
Vitals	Stable	Unstable
Pain	Localized	Generalized (due to irritation of peritoneal lining)
P/A	Tenderness localized to one side iliac fossa or hypogastrium (referred pain)	• Abdominal distension • Shifting dullness • Guarding, tenderness and rigidity
Signs and symptoms of hemoperitoneum	-	Bluish discolouration in: • Around umbilicus **(Cullen's sign)** • In flanks **(Gray Turner's sign)** Shoulder tip pain: **Danforth sign** • Due to irritation of diaphragm
P/V	Uterus: normal size Tender adnexal mass Cervical motion tenderness	Bogginess fet through fornices (due to blood collected in Pouch of Douglas)

Q8.11: What is the investigation of choice for ectopic pregnancy?

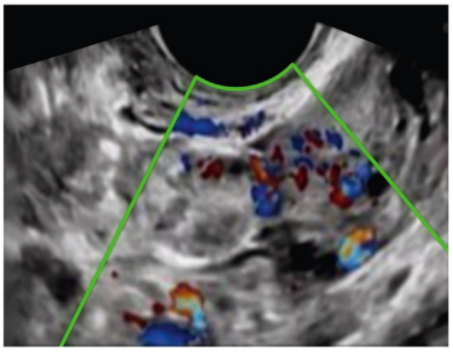
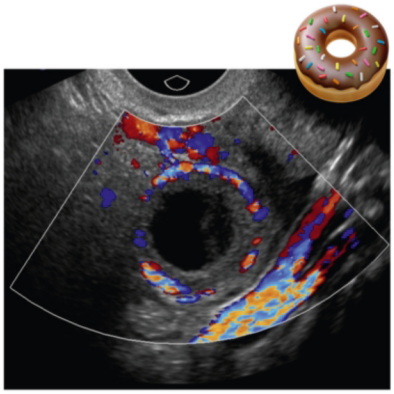
Answer:

- USG (preferably TVS)
- 1st finding that will raise suspicion of ectopic: Empty uterine cavity

- Most definitive sign: Gestational sac with cardiac activity in the region of the adnexa
- Most common finding: Complex adnexal mass
- With ruptured ectopic → Uterus is empty + Hemoperitoneum

Q8.12: What is the Blob sign and Bagel sign in ectopic pregnancy?

Answer:

Blob sign	Bagel sign
Inhomogeneous mass adjacent to the uterine cavity	• Anechoic centre • Increased vascularity in periphery • Tubal ring of fire
	

Q8.13: What is the clinical management of ruptured tubal ectopic pregnancy?

Answer:

- Salpingectomy
- If unstable → Laparotomy
- If stable → Laparoscopy

Q8.14: What is the medical management of unruptured tubal ectopic pregnancy?

Answer:

- **Criteria**
  - Stable, compliant
  - Beta-hCG: < 5000 IU/L (most important predictor for success of medical management)
  - Cardiac activity is preferably absent
  - Sac size: < 4cm
- **DOC:** Methotrexate
  - Day 1: Inj. Methotrexate 50 mg/m^2 (IM)
  - Repeat serum beta-hCG on day 4 & 7:
    - → If 15% decline → Weekly serum hCG till negative
    - → If < 15% decline → Repeat dose
    - → No success after 3 repeat doses → Failed medical management

Q8.15: What is the surgical management of unruptured tubal ectopic pregnancy?

Answer: Surgical Management:

- **Indications:**
  - Criteria for medical management not met
  - Family complete

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- Any contraindication for methotrexate
- Failed medical management
- Non-compliant for follow-up

- If other tube healthy and/or family complete → **Salpingectomy**
- If other tubes look unhealthy or risk factors for infertility are present → **Salpingostomy**
- **Route:** Laparoscopy

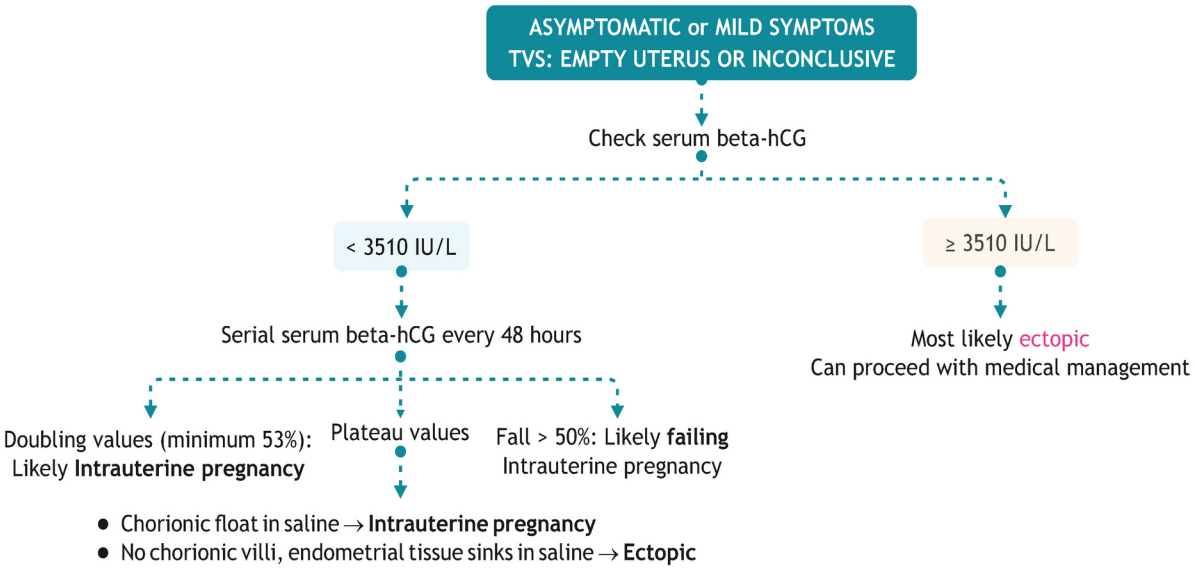
Q8.16: A 25-year-old woman with 7 weeks of amenorrhea comes to the gynecology OPD with complaints of off-and-on pain in the lower abdomen. Her UPT was positive at home. Abdominal and vaginal examination is unremarkable. TVS shows an empty uterine cavity. What is the next step in management?

A. Perform D&C
B. Send serum beta-HCG
C. Follow up 2 weeks later for repeat TVS
D. Perform laparoscopy

Answer: B. Send serum beta-HCG

BIG QUESTION 9: How to approach pregnancy of unknown location?

Broad Answer:



DETAILED QUESTIONS

Q9.1: What is heterotopic pregnancy?

Answer: Intrauterine pregnancy (IUP) + Ectopic (M/c tubal)

Q9.2: What is angular pregnancy?

Answer:

- Eccentrically implanted IUP medial to round ligament.
- Interstitial ectopic → Lateral to round ligament

Q9.3: What is the diagnostic criteria for ectopic pregnancies of various site?

Answer:

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Site of Ectopic pregnancy	Criteria
Cervical ectopic	Paalman, Rubin
Primary ovarian ectopic	Speigelberg
Primary abdominal ectopic	Studdiford

Q9.4: What is the presentation of cervical ectopic pregnancy?

Answer: Painless vaginal bleeding

Q9.5: What is Paalman's criteria?

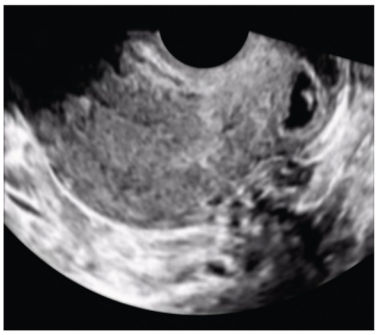
Answer:

- Ectopic inside cervix → Limited to endocervical canal
- Internal os → Closed
- External os → Slightly open
- Cervix → Ballooned out

Q9.6: What is the differential diagnosis for cervical ectopic pregnancy?

Answer:

- Gestational sac passing through cervical canal in inevitable abortion → Sliding sign positive.
- Cervical ectopic pregnancy → Sliding sign negative.



BIG QUESTION 10: What is molar pregnancy?

Broad Answer:

- It is a type of benign gestational trophoblastic disease.
- **Types:**
  - Complete mole
  - Partial mole

DETAILED QUESTIONS:

Q10.1: Differentiate between complete and partial mole on etiology?

Answer:

Features	Complete Mole	Partial Mole
Ploidy status	Diploid	Triploid
Karyotype	46 XX (most common)	69 XXX (most common)
Monospermic or Dispermic	Monospermic (mostly)	Dispermic
Genetic material	All nuclear material - Paternal	Extra-genetic material - Paternal
P57KIP2 Immunostain	Negative	Positive
Vascularity of villi	Absent	Vascular in parts

Excessive hCG	Usually >10^5 IU/L	Usually < 10^5 IU/L
Medical complications	More likely	Very rare
Risk of progression to GTN	15-20%	1-5%

Q10.2: Differentiate between complete and partial mole based on HPE features?

Answer:

HPE Features	Complete Mole	Partial Mole
Fetal or Embryonic Tissue	Absent	Present, usually dead
Hydropic swelling of chorionic villi	Complete	Partial degeneration/cystic placenta
Trophoblastic proliferation	Extensive	Trophoblastic scalloping

Q10.3: What are the risk factors for molar pregnancy?

Answer:

- Extremes of maternal age
- H/o prior molar pregnancy
- Ethnic predisposition (in south asians)
- Genetic factors

Q10.4: What is the percentage risk of recurrence in individuals with a history of a prior complete molar pregnancy?

Answer: Recurrence risk with history of:

- 1 prior complete molar pregnancy: 1-2%
- 2 prior complete molar pregnancy: 20%

Q10.5: In cases of familial recurrent complete molar pregnancies, mutations are found in which gene?

Answer: NLRP7 locus on chromosome 19s

Q10.6: What conditions are commonly associated with molar pregnancy?

Answer:

- Hyperemesis
- Thecal lutein cysts
- Preeclampsia
- Hyperthyroidism
- Pulmonary edema

Q10.7: What are the major risk factors for developing a complete molar pregnancy?

Answer:

- Age > 40 years
- hCG > 1 lac IU/L
- Uterus size > 16 weeks
- B/L theca lutein cysts ≥ 6cm

Q10.8: A 19-year-old primigravida at 12 weeks of gestation presents with excessive nausea and vomiting along with irregular vaginal bleeding for the past week. Home urine pregnancy test (UPT) is positive. Pulse rate is 100/min, blood pressure is 110/70 mmHg. Cardiovascular and respiratory examinations are normal, with no history of breathlessness or tremors. On per abdominal examination, the uterus is enlarged to the size corresponding to 20 weeks of gestation; fetal parts are not palpable and fetal heart sounds are not heard. Per vaginal examination reveals mild bleeding with a closed cervical os, and bilateral adnexal masses measuring approximately 5 cm are noted. What is the most likely diagnosis?

A. Molar pregnancy

B. Multiple pregnancy

C. Polyhydramnios

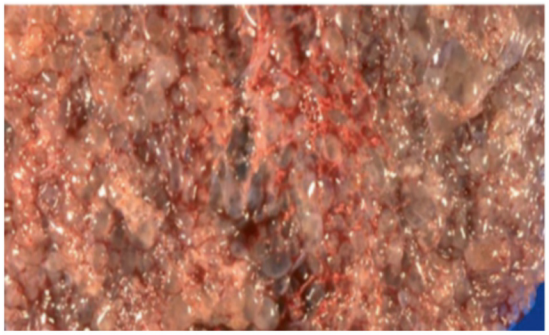
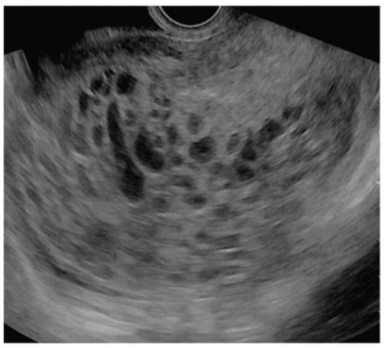
D. IUD

Answer: B. Molar pregnancy

- Molar pregnancy:
  - Excessive nausea and vomiting (due to hCG)
  - Irregular vaginal bleeding (m/c complain)
- Partial mole: Mostly misdiagnosed as a missed abortion

Q10.9: What is the investigation of choice of complete mole?

Answer: Investigation of choice: USG pelvis (to rule out differential diagnosis)

Gross	USG
Grape-like vesicles ditending uterine cavity	Snowstorm appearance (complete mole)
	

Q10.10: What is the definite differentiation between complete and partial mole?

Answer:

- HPE
- DNA ploidy status
- Immunostaining

Q10.11: What is the treatment of choice for molar pregnancy?

Answer:

- Suction & Evacuation
- Medical management causes: Pulmonary embolism
- Oxytocin used along with suction and evacuation to reduce bleeding.
- Theca lutein cysts requires no additional treatment unless associated with complications
  - Spontaneously regress in 2-4 months (beta-hCG decrease)
- Prophylactic chemotherapy - Not routine

Q10.12: What is the follow-up schedule after suction and evacuation of molar pregnancy?

Answer: Follow-up after evacuation done with serum beta-hCG:

- 1st value: 48 hours after evacuation
- Weekly till 3 consecutive normal values
- Then monthly for 6 months

Q10.13: What is the average time taken for hCG levels to normalize?

Answer:

- Complete mole: ~7 weeks
- Partial mole: ~6 weeks

Q10.14: What is the preferred contraception during follow-up?

Answer:

- OCPs
- IUDs (Mirena, CuT) → Contraindicated due to high risk of perforation

Q10.15: What is the role of hysterectomy in complete moles?

Answer:

- Not preferred, as it will not eliminate risk of progression to GTN (Follow-up with hCG levels still required).
- **Possible role:**
  - Age > 40 years & completed family
  - Intractable bleeding
  - Invasive mole perforating uterus

BIG QUESTION 11: When does gestational trophoblastic neoplasia (GTN) typically develop, and what are its different types?

Broad Answer:

- GTN can occur after any pregnancy event, but most commonly after molar pregnancy.
- **Types:**
  - Invasive mole
  - Choriocarcinoma
  - Placental site trophoblastic tumor (PSTT)
  - Epithelioid trophoblastic tumor (ETT)
- Most common GTN developing after molar pregnancy: Invasive mole > Choriocarcinoma

DETAILED QUESTIONS

Q11.1: What is the marker for GTN?

Answer: Serum Beta-hCG

Q11.2: Describe the types of GTN.

Answer:

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Invasive mole	Choriocarcinoma	Placental Site Trophoblastic Tumor (PSTT)	Epithelioid Trophoblastic Tumor (ETT)
• Most common • Villi structure preserved • Villi invading into myometrium	• 2nd most common • Villi structure lost • Neoplastic dimorphic cells	• Rare • Villi structure lost • Proliferation of extravillous intermediate trophoblast cells • **Marker**: o hPL (human placental lactogen) o PLAP (placental alkaline phosphatase)	Very rare

Q11.3: Which is the most common type of GTN after full-term pregnancy?

Answer:

- Choriocarcinoma
- PSTT and ETT are rare and always develop after full-term pregnancy.

Q11.4: A 40-year-old, P3L3 woman had an uncomplicated pregnancy and delivered a full term healthy baby 3 months ago. She complains of persistent bleeding since then. She also underwent D&C at a peripheral hospital, but the HPE report is not available. She has no relief from symptoms. What is the likely diagnosis?

A. PPH

B. DIC

C. GTN

D. Normal labia

Answer:

- C. GTN (Gestational Trophoblastic Neoplasia)
- During follow-up after molar pregnancy evacuation
- AUB in the reproductive age group and no relief on conventional treatment

Q11.5: What is the clinical presentation of GTN?

Answer:

- Persistent or irregular bleeding
- Uterine subinvolution
- Intraperitoneal bleeding or shock
- Persistence of theca lutein cysts, Evidence of metastases

Q11.6: What is the diagnostic criteria for GTN?

Answer:

- During the follow-up of molar pregnancy evacuation:
  - 4 consecutive beta hCG values showing plateau (+/- 10%) over 3 weeks
  - 3 consecutive beta hCG values showing rising (> 10%) over 2 weeks
- Persistence of beta hCG after 6 months of evacuation
- HPE diagnosis
- Evidence of metastases with increased hCG levels

Q11.7: What is FIGO staging of GTN?

Answer:

Stage I	Stage II	Stage III	Stage IV
Confined to uterus	Adnexa/vaginal metastasis	Lung metastasis	All other metastasis

Q11.8: What is the most common site of metastasis in GTN?

Answer:

- Lungs > vagina > pelvis > liver > brain
- Most common route: Hematogenous

Cannonball metastasis in lungs	Vaginal metastasis High chances of bleed → No biopsy
	

Q11.9: What is the treatment of choice in GTN?

Answer: Chemotherapy

Q11.10: What is modified WHO Prognostic Scoring System?

Answer:

Figo Score	0	1	2	4
Age (years)	< 40	≥ 40		
Antecedent pregnancy	Molar	Abortion	Term pregnancy	
Interval from index pregnancy		4-6 months	7-12 months	≥ 13 months
Pre treatment hCG	< 1000	10^3 - 10^4	10^4 - 10^5	> 1 lac
Largest tumor size	< 3cm	3-5 cm	> 5cm	
Site of metastasis	Lung	Spleen, kidney	GIT	Brain, liver
Number of metastasis	0	1 -4	5-8	>8
Past failed chemotherapy			Single drug	≥ 2 drugs

Q11.11: What is the interpretation and management of Modified WHO Prognostic Scoring System?

Answer:

- **Low risk: Score ≤ 6**
  - Single-agent chemotherapy
  - DOC: Methotrexate IM
  - Multidose regimen alternating with folinic acid (calcium leucovorin) to prevent adverse effects of methotrexate.
- **High risk: Score ≥ 7**
  - Multiagent chemotherapy
  - EMACO regimen
    - → **E - E**toposide
    - → **M - M**ethotrexate
    - → **A - A**ctinomycin D
    - → **C - C**yclophosphamide
    - → **O -** Vincristine (**O**ncovin)

Q11.12: What is the role of hysterectomy in GTN?

Answer:

- In PSTT and ETT → Chemoresistant
- In perforation invasive mole
- In failed chemotherapy

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10. LABOUR AND DELIVERY

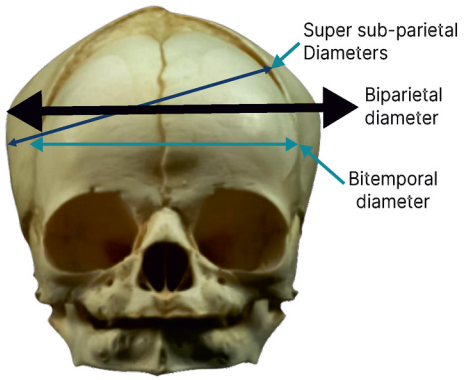
BIG QUESTION 1: What are the diameters of the fetal skull and their clinical relevance?

Broad Answer: The fetal skull has multiple diameters measured to understand labor mechanics. These diameters help determine whether vaginal delivery is possible.

DETAILED QUESTIONS

Q1.1: What are the major diameters of the fetal skull?

Answer:



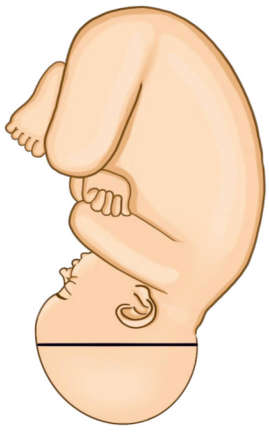
DIAMETERS	
Biparietal	9.5 cms
Super sub-parietal	8.5 cms
Bitemporal	8 cms
Bimastoid	7.5 cms Smallest diameter Non-compressible
Mentovertical	14 cms Largest diameter of fetal skull

Q1.2: Which is the smallest and non-compressible diameter?

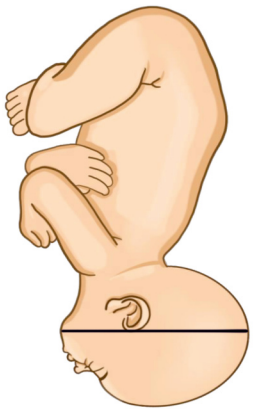
Answer: Bitemporal: 8 cm (smallest, non-compressible)

1.3: What are the engaging diameters of the fetal head in well-flexed, neutral, deflexed and completely extended positions?

Answer:



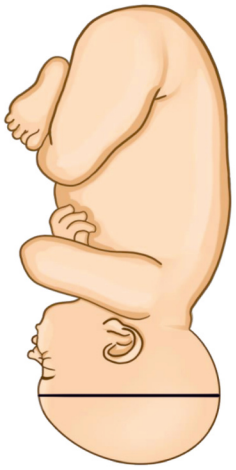
- Engaging diameter of well-flexed head:
  - Suboccipito bregmatic (9.5 cms)



- Engaging diameter of head in neutral position:
  - Mentovertical (Military) → Brow presentation

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- Engaging diameter of deflexed head:
  - Occipitofrontal (11.5 cms)- in the image
  - Suboccipitofrontal (10 cms)



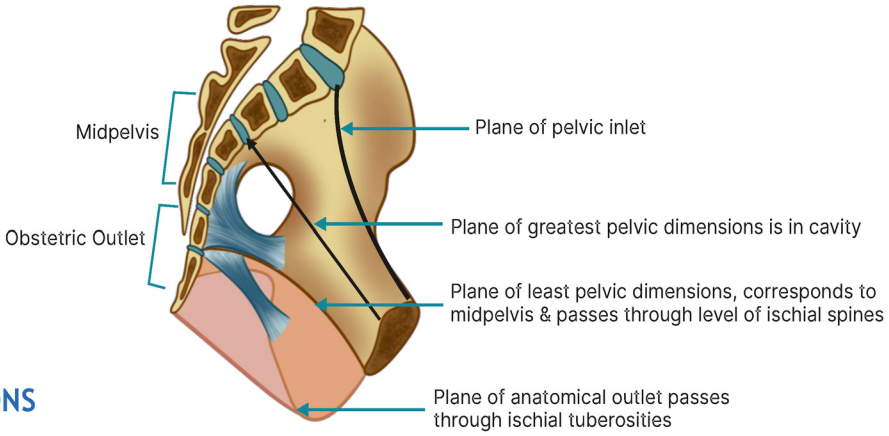
- Engaging diameter of completely extended head:
  - Submento bregmatic (9.5 cms)

Q1.4: What is the largest diameter of the fetal skull?

Answer: Mentovertical: 14 cm

BIG QUESTION 2: What are the important features and diameters of the maternal pelvis?

Broad Answer: The maternal pelvis is assessed during labor for compatibility with fetal head dimensions. Key diameters at different pelvic planes guide labor management.



DETAILED QUESTIONS

Q2.1: What are the pelvic planes and their significance?

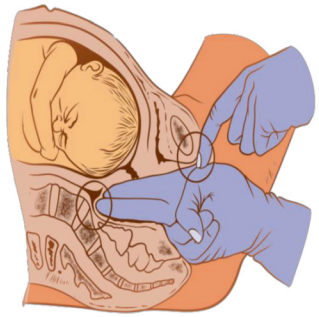
Answer:

- Plane of pelvic inlet
- Plane of greatest pelvic dimension (cavity)
- Plane of least pelvic dimensions (midpelvis)
- Plane of anatomical outlet (ischial tuberosities)
- Plane of obstetric outlet (ischial spines)

Q2.2: What are the diameters of the pelvic inlet?

Answer:

- True conjugate: From the upper border of pubic symphysis to the tip of sacral promontory.
- Diagonal conjugate (DC): From the lower border of the pubic symphysis to the tip of sacral promontory. It can be measured clinically. 12 cm
- Obstetric conjugate (OC): 10-10.5 cm (OC = DC - 1.5 to 2 cm)

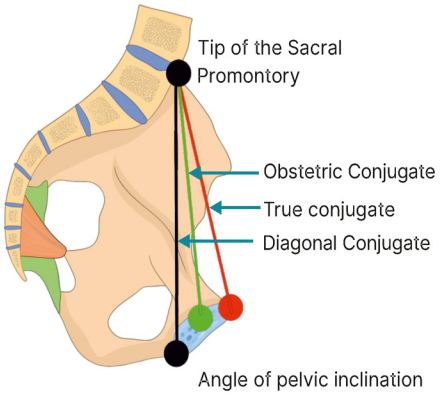


Measurement of Diagonal conjugate

Q2.3: What is the angle of pelvic inclination?

Answer:

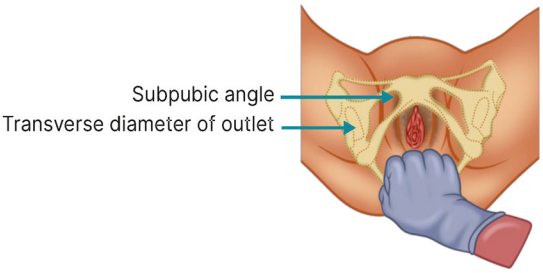
- Normal: 55 degrees
- High inclination seen in sacralization of lumbar vertebra
- Angle that plane of pelvic inlet makes with the horizontal
- Angle that plane of pelvic inlet makes with the horizontal



Q2.4: What is the transverse diameter of the outlet?

Answer:

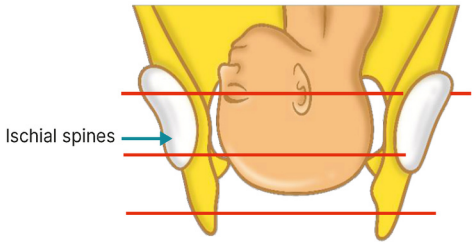
- 11 cm (AKA intertuberous diameter)
- Subpubic angle: 85 degrees (wide and obtuse)



Q2.5: What is the significance of the interspinous diameter?

Answer:

- Smallest and most important diameter of true pelvis
- AKA inter-ischial diameter
- At this level: internal rotation of head occurs, forward pelvic curve begins
- Ischial spine corresponds to 0 station



BIG QUESTION 3: How is fetal station and engagement determined?

Broad Answer: Fetal station describes the position of the presenting part relative to the ischial spines. Engagement occurs when the biparietal diameter crosses the pelvic inlet.

DETAILED QUESTIONS

Q3.1: What is fetal station?

Answer:

- Relation of presenting part to ischial spines
  - o + Station: when the leading point is above
  - o - Station: when the leading point is below

Q3.2: When is a head considered engaged?

Answer:

- Biparietal diameter crosses pelvic brim/inlet
- Head is 0/5 or 1/5 palpable above pelvic brim
- Station is 0

Q3.3: What are the causes of an unengaged/free-floating head at term?

Answer:

- Full bladder
- Deflexed head (most common)
- Cephalopelvic disproportion (2nd most common)
- Placenta previa

BIG QUESTION 4: What constitutes a contracted pelvis and how is it assessed?

Broad Answer: A contracted pelvis is defined based on specific diameter reductions in inlet, cavity, or outlet. Clinical or labor-based assessment is key.

DETAILED QUESTIONS

Q4.1: What defines a contracted inlet?

Answer:

- Obstetric conjugate <10 cm
- Diagonal conjugate <11.5 cm

Q4.2: What defines a contracted cavity?

Answer: Inter-ischial diameter <8 cm

Q4.3: What defines a contracted outlet?

Answer: Transverse diameter of outlet <8 cm

Q4.4: How is pelvic assessment for CPD best done?

Answer:

- Trial of labor is best
- Done during labor in most women
- Mild CPD at inlet: Trial of labor
- CPD at midpelvis/outlet: Cesarean section

Q4.5: What are grossly abnormal pelvis types?

Answer:

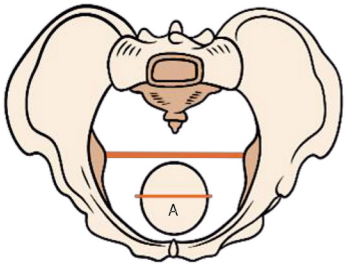
- **Robert's pelvis:** Both sacral ala absent
- **Naegele's pelvis:** One sacral ala absent

PYQ: FMGE 2019, 2020, 2021

BIG QUESTION 5: What are the different pelvis types and their clinical significance?

Broad Answer: The Caldwell-Moloy classification categorizes pelvis types, each with unique features affecting labor progression and mode of delivery.

DETAILED QUESTIONS



Q5.1: What are the features of a gynecoid pelvis?

Answer:

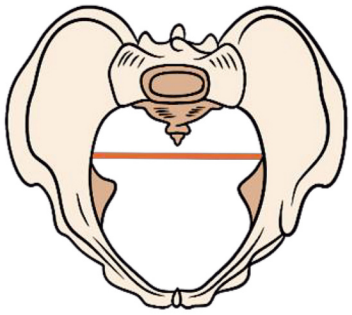
- Most common type
- Round or oval shape

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Q5.2: What are the features of an anthropoid pelvis?

Answer:

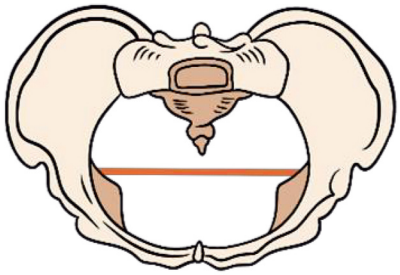
- Anteroposteriorly oval
- Associated with direct occipito-posterior position and face-to-pubis delivery



Q5.3: What are the features of a platypelloid pelvis?

Answer:

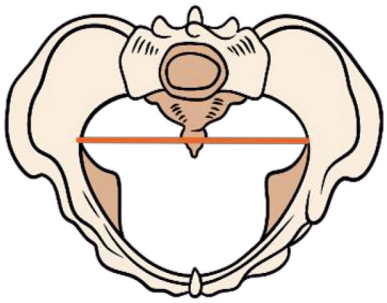
- Flat pelvis - transversely oval
- Associated with face and brow presentation
- In flat pelvis, the head can engage by exaggerated asynclitism



Q5.4: What are the features of an android pelvis?

Answer:

- Triangular, prominent ischial spines, narrow inter-ischial diameter
- Associated with ROP position, deep transverse arrest, dystocia dystrophica syndrome
- Mostly cesarean section is done



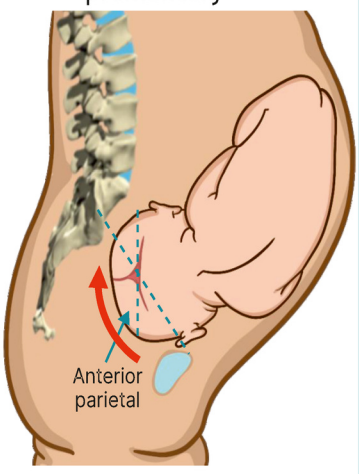
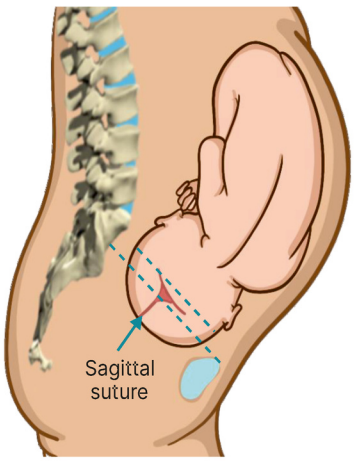
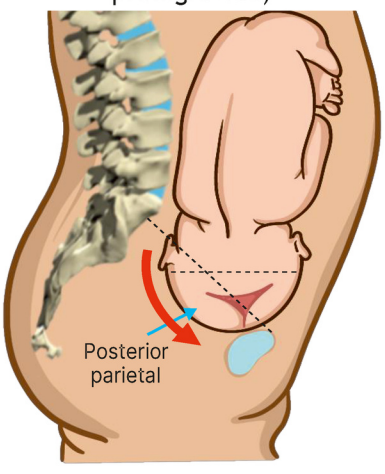
BIG QUESTION 6: What is asynclitism and how does it affect labor?

Broad Answer: Asynclitism refers to the lateral deviation of the sagittal suture of the fetal head from the central position between the maternal pelvis. It can be physiological or pathological.

DETAILED QUESTIONS

Q6.1: What are the types of asynclitism?

Answer:

Anterior asynclitism: Anterior parietal bone presents; sagittal suture towards sacral promontory	**Synclitism:** Sagittal suture is midway between pubic symphysis and sacral promontory	**Posterior asynclitism:** Posterior parietal bone presents; sagittal suture towards pubic symphysis (more common in primigravida)
		

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Q6.2: What is the engaging diameter in asynclitism?

Answer: Super subparietal diameter engages instead of biparietal diameter

Q6.3: What is exaggerated asynclitism and its consequence?

Answer:

- Exaggerated asynclitism does not correct itself during labor.
- Can be associated with CPD

BIG QUESTION 7: What are the Leopold maneuvers and their clinical utility?

Broad Answer: Leopold maneuvers are systematic abdominal palpations used to determine fetal lie, position, and engagement.

DETAILED QUESTIONS

Q7.1: What are the Leopold maneuvers?

Answer: PYQ: NEET PG 2021, 2022 PYQ: INICET 2022 PYQ: FMGE 2021

I. FUNDAL GRIP	II. LATERAL GRIP
• Gives an idea about **lie** 	• Gives an idea about **position** 
III. PAWLICK'S GRIP	**IV. PELVIC GRIP**
• Gives an idea about lie 	• Gives an idea about **engagement, descent & flexion of head** 

BIG QUESTION 8: What are fetal lie and fetal position, and how are they clinically relevant?

Broad Answer: Fetal lie describes the orientation of the fetus in the uterus. Fetal position refers to the relationship of the fetal presenting part to the maternal pelvis. Both are crucial for labor and delivery management.

DETAILED QUESTIONS

Q8.1: What is a fetal lie?

Answer:

- Relationship between the long axis of fetus and maternal spine or centralized uterine axis
- Types include longitudinal, transverse, and oblique

Q8.2: What are the causes of unstable or oblique lie at term?

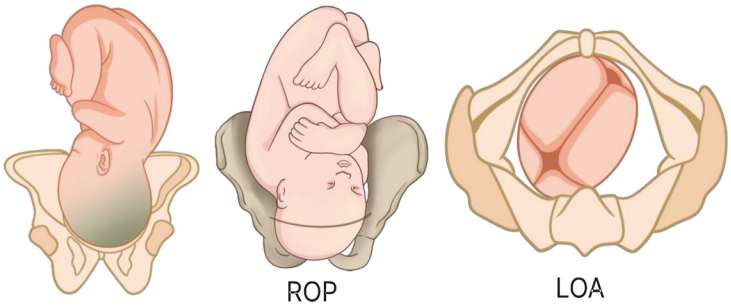
Answer:

- Lie not stable at term
- Causes:
  - Idiopathic (most common)
  - Full bladder
  - Placenta previa
  - Polyhydramnios
  - Most common location of placenta in unstable lie: Fundal

Q8.3: What are the types of fetal positions?

Answer:

- Left occipitoanterior (LOA): Posterior fontanelle (Lambda) & occiput towards left
- Left occipitotransverse (LOT): More common than LOA
- Right occipitoanterior (ROP): Occiput towards right and directed anteriorly



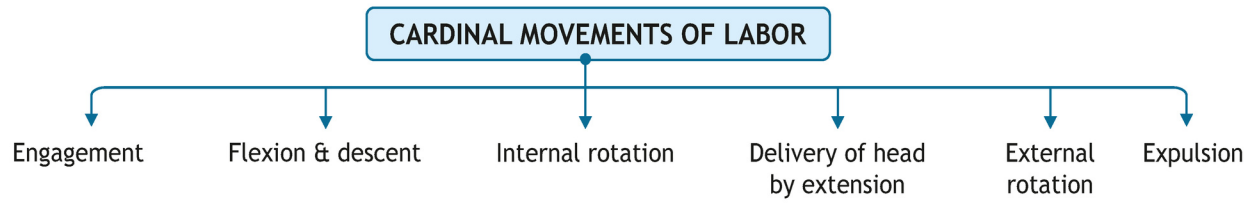
BIG QUESTION 9: What is the mechanism of labor and what are the cardinal movements?

Broad Answer: The mechanism of labor involves a series of movements that the fetus undergoes to navigate through the birth canal. These are known as the cardinal movements of labor.

DETAILED QUESTIONS

Q9.1: What are the cardinal movements of labor in sequence?

Answer:



Q9.2: What are the clinical differences between occipitoanterior and occipitoposterior positions?

Answer:

Feature	Occipitoposterior	Occipitoanterior
Abdominal signs	**Infraumbilical flattening**	Suprapubic bulge
Palpation	Limbs felt anteriorly	Fetal back felt anteriorly
FHS location	Heard best at flanks	Best heard anteriorly at the midpoint of spinoumbilical line
Vaginal exam	Anterior fontanelle felt easily	Posterior fontanelle felt
Engagement	Head often unengaged & deflexed	Head engaged
Labor	Often prolonged, early ROM	Normal progression
		

Q9.3: What is the most common cause of ROP position and its management?

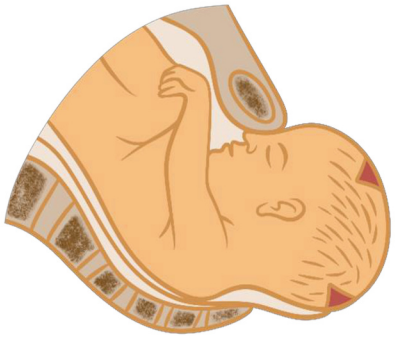
Answer:

- Most common cause: **Android pelvis > deflexed head (ROP > LOP)**
- More common in primigravida
- Favorable outcome with good contractions, favorable pelvis shape and size, average fetal size, progressive head flexion
- Management:
  - ROP in labor → Allow spontaneous progression of labor
  - If **deep transverse arrest** → Cesarean section
  - Direct OP → Face-to-pubis delivery possible in anthropoid or spacious gynecoid pelvis

Q9.4: What characterizes a face-to-pubis delivery?

Answer:

- Head delivers by flexion followed by extension
- More chances of perineal tears
- Diameter distending vulval outlet = Occipitofrontal



BIG QUESTION 10: What are the phases of parturition and how does the uterus prepare for labor?

Broad Answer: Parturition occurs in four phases: quiescence, activation, stimulation (labor), and involution. The uterus undergoes multiple changes including receptor upregulation and segment formation to prepare for labor.

DETAILED QUESTIONS

Q10.1: What are the four phases of parturition?

Answer:

Phase 1	Phase 2	Phase 3	Phase 4
Quiescence	Activation	Stimulation	Involution
Uterus unresponsive	Uterine prep & cervical ripening	Clinical stages of labor	Puerperium

Q10.2: What are the key preparatory changes for labor?

Answer:

- Oxytocin receptors & gap junctions (connexin 43) in myometrium - increases
- Formation of lower uterine segment → Fundal height decreases → Lightening (sense of relief of symptoms, welcome sign)

Q10.3: What happens during cervical ripening?

Answer:

- Cervix becomes soft & dilatable
- Mainly mediated by PGE2
- Collagen breakdown
- Increase in hyaluronan & water content
- Decrease in chondroitin & dermatan sulfate

Q10.4: What signals the onset of labor?

Answer:

- Fetal endocrine cascade: ↑ Fetal CRH → ↑ Fetal DHEAS →↑ Estrogen from placenta
- Mechanical stretch of uterus and membranes

BIG QUESTION 11: What are the clinical stages of labor and associated uterine contractions?

Broad Answer: Labor progresses through four clinical stages and is driven by coordinated uterine contractions. Monitoring contraction strength, frequency, and effects on cervical changes is vital.

DETAILED QUESTIONS

Q11.1: What are the stages of labor?

Answer:

1ST STAGE	• 0nset of true labor pains to full cervical dilatation (10 cms)
2ND STAGE	• Delivery of fetus
3RD STAGE	• Delivery of placenta
4TH STAGE	• 1 hour observation

Q11.2: What characterizes true labor pains?

Answer:

- Occur at regular intervals with increasing intensity, frequency, and duration
- Most important diagnostic feature: Progressive cervical dilatation and effacement

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- Formation of bag of membranes
- "Show" = Blood mixed vaginal discharge
- In primigravida: Effacement occurs 1st followed by dilatation
- In multigravida: Both proceed together

Q11.3: What is the role of uterine contractions?

Answer:

- Promote cervical dilatation and effacement
- Have property of retraction
- **Braxton Hicks** = painless contractions
- At 10 mm Hg intensity, contractions become palpable
- At 15 mm Hg, contractions are painful & capable of causing dilatation
- At 40 mm Hg, contractions are of moderate intensity

BIG QUESTION 12: What defines active labor, and how is labor monitored using the WHO Partogram?

Broad Answer: Active labor begins once cervical dilation reaches a specific threshold and is accompanied by effective contractions. Labor progress is tracked using partograms to detect abnormalities and guide timely interventions.

DETAILED QUESTIONS

Q12.1: When does active labor begin?

Answer:

- WHO: At 5 cm cervical dilation with substantial effacement
- ACOG: At 6 cm dilation

Q12.2: What is the average rate of cervical dilation in active labor?

Answer:

- Nulliparous: 1.2 cm/hour
- Multiparous: 1.5 cm/hour

Q12.3: What is the maximum duration of active phase?

Answer:

- Nullipara: Should not exceed 12 hours
- Multipara: Should not exceed 10 hours

Q12.4: What are protraction disorders in labor?

Answer:

- Protracted active phase dilation: Slower than expected cervical dilation
- Protracted descent:
  - <1 cm/hour in primi
  - <2 cm/hour in multi

Q12.5: What is the average duration of 2nd stage and when is it usually completed in most women ?

Answer:

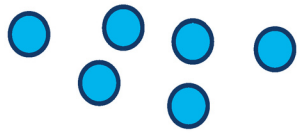
	NULLIPAROUS	MULTIPAROUS
Average duration of 2nd stage	~50 mins	~30 mins
Usually completed for most women	~3 hours	~2 hours

Q12.6: What is the WHO Modified Partogram?

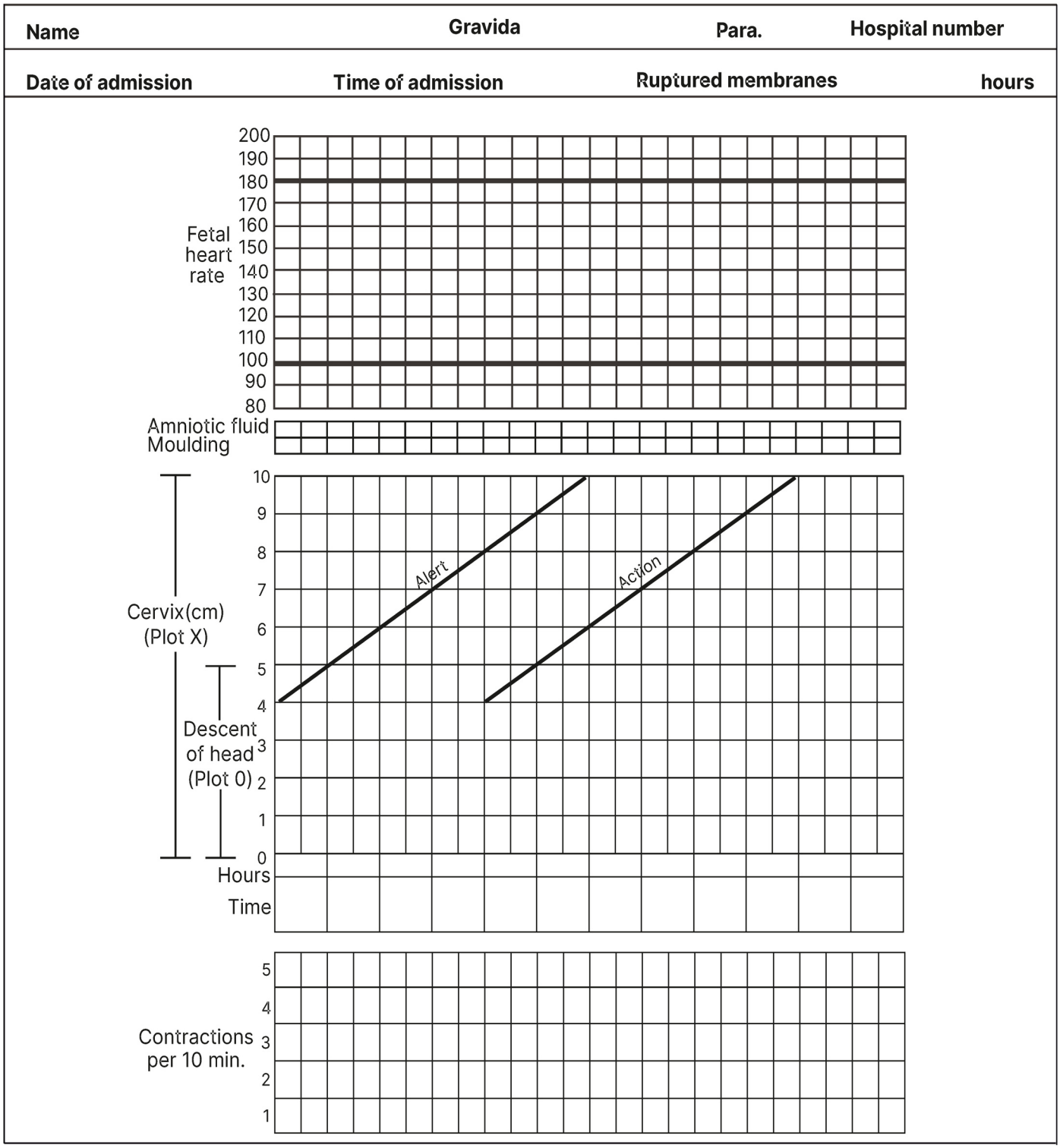
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Answer:

- Based on Friedman's curve
- Concept of alert line by Philpott & Castle
- Alert line: Corresponds to 1 cm/hour dilation
- Action line: Intervention if crossed
- Plotting begins at 4 cm; latent phase excluded
- Distance between alert & action lines: 4 hours
- Uterine contractions plotted as number in 10 minutes:
  - Big box: 1 hour
  - Small box: 30 minutes
- Tachysystole: >5 contractions per 10 minutes
- At least 3 good contractions per 10 minutes needed
- FHR recorded every 30 minutes

	**Mild**	**< 20 secs**
	Moderate	**20-40 secs**
	Good	> 40 Secs

Frequency of FHR monitoring	1st stage	2nd stage
Low-risk	30 mins	15 mins
High-risk	15 mins	5 mins



Q12.6: What are the time limits for the second stage?

Answer:

- Nulliparous: ~50 minutes average, up to 3 hours
- Multiparous: ~30 minutes average, up to 2 hours

BIG QUESTION 13: What is the WHO Next Generation Partogram and Labour Care Guide?

Broad Answer: The WHO Next Generation Partogram and Labour Care Guide are tools to monitor labor, emphasizing supportive care, individualized thresholds, and quality improvement.

DETAILED QUESTIONS

Q13.1: What are the features of the WHO Next Generation Partogram?

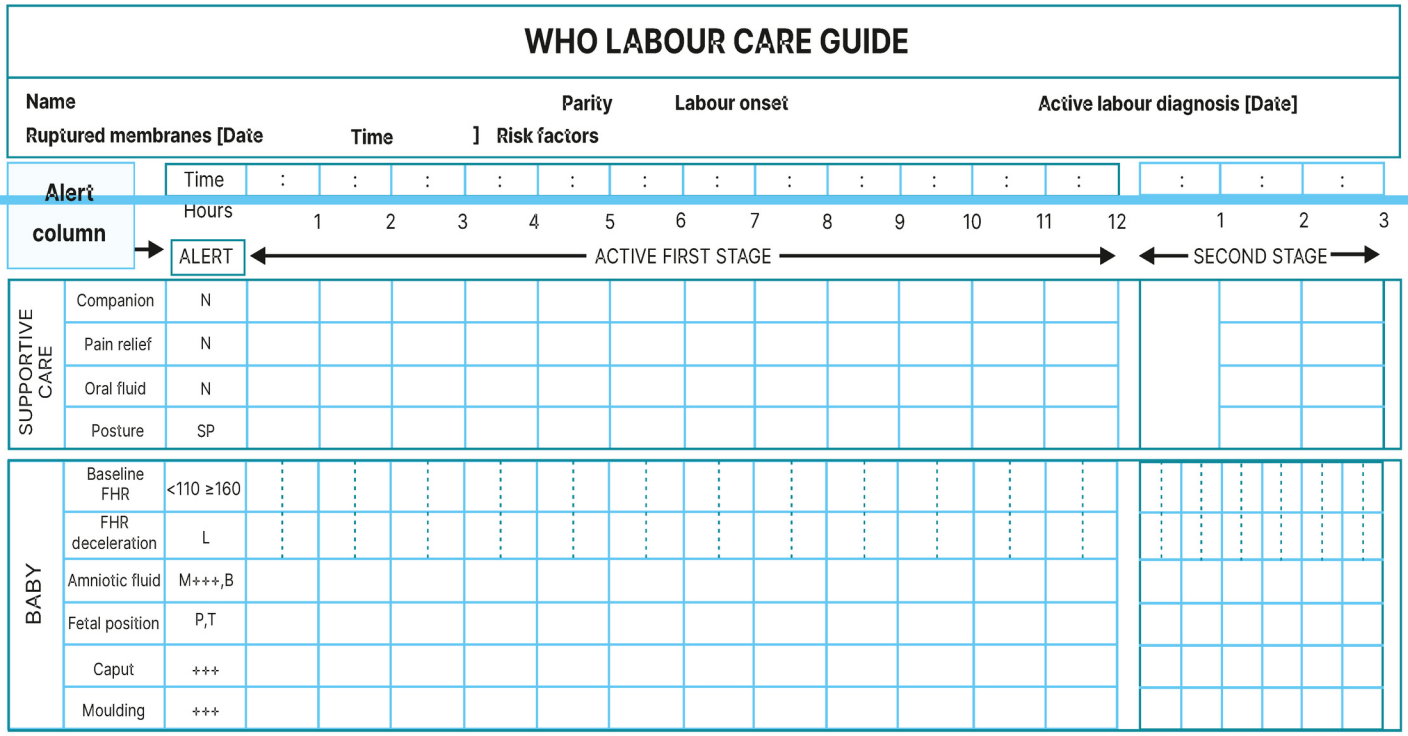
Answer:

- Begins at 5 cm cervical dilation
- No alert or action lines
- Space included for monitoring the second stage
- Specific alert thresholds defined
- Supportive care components added:
  - Companion present or not
  - Pain relief
  - Oral fluids
  - Maternal posture

Q13.2: What does the WHO Labour Care Guide include?

Answer:

- Name, parity, labor onset, and active labor diagnosis
- Time of ruptured membranes
- Risk factors noted



Q13.3: How is time tracked in the Labour Care Guide?

Answer: Alert time column includes hours 1 to 12 (first stage) and hours 1 to 3 (second stage)

Q13.4: What supportive care elements are documented?

Answer:

- Companion support
- Pain relief options
- Fluid intake
- Maternal posture

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Q13.5: What clinical assessments are included?

Answer:

- Fetal heart rate (FHR) baseline and decelerations
- Amniotic fluid quality (e.g. M+++, B)
- Fetal position
- Caput and moulding levels

BIG QUESTION 14: How is prolonged latent phase diagnosed and managed?

Broad Answer: Latent phase of labor is managed conservatively unless complications arise. Prolongation is assessed using clinical criteria and interventions guided by cervical progress and uterine activity.

DETAILED QUESTIONS

Q14.1: What defines a prolonged latent phase?

Answer:

- >20 hours in primigravida
- >14 hours in multigravida

Q14.2: What are common causes of prolonged latent phase?

Answer:

- False labor
- Excessive sedation
- Epidural anesthesia
- Poor cervical condition
- Inadequate uterine contractions

Q14.3: What is the initial management of prolonged latent phase?

Answer:

- Wait and watch →Therapeutic rest
- No artificial rupture of membranes (ARM)

Q14.4: A 25-year-old primigravida at term is 2 cm dilated and 80% effaced after 12 hours of mild labor pains. What is NOT done?

A. Sedation

B. Rest

C. Encourage ambulation

D. Oxytocin augmentation

Answer:

- d) Oxytocin augmentation
- Rationale: Patient is in latent phase; managed with sedation, rest, and ambulation encouragement. Augmentation is not indicated.

BIG QUESTION 15: How is labor arrest diagnosed in the active phase and second stage?

Broad Answer: Labor arrest is diagnosed based on lack of cervical dilatation or fetal descent despite adequate contractions. Management depends on the underlying cause (e.g., CPD, malposition).

DETAILED QUESTIONS

Q15.1: What defines arrest in active phase dilatation?

Answer:

- Cervical dilatation ≥6 cm with ruptured membranes
- No progress in dilation for ≥4 hours with good contractions
- Indication for cesarean section

Q15.2: A multigravida in second stage for 2 hours with station 0, molding 3+, caput 2+, FHR 110, sagittal suture in ROT. Best management?

A. Midpelvic forceps application
B. Vacuum assisted vaginal delivery
C. Wait & watch for one more hour
D. Cesarean section

Answer:

- d. Cesarean section
- Rationale: Prolonged second stage with CPD signs and deep transverse arrest

Q15.3: What are criteria for prolonged/arrested second stage?

Answer:

- No descent/rotation for:
  - 3 hours in nullipara
  - 2 hours in multipara

Q15.4: When is a cesarean section indicated in the second stage?

Answer:

- CPD
- Grade 3 molding

Q15.5: When can instrumental delivery be done instead of cesarean?

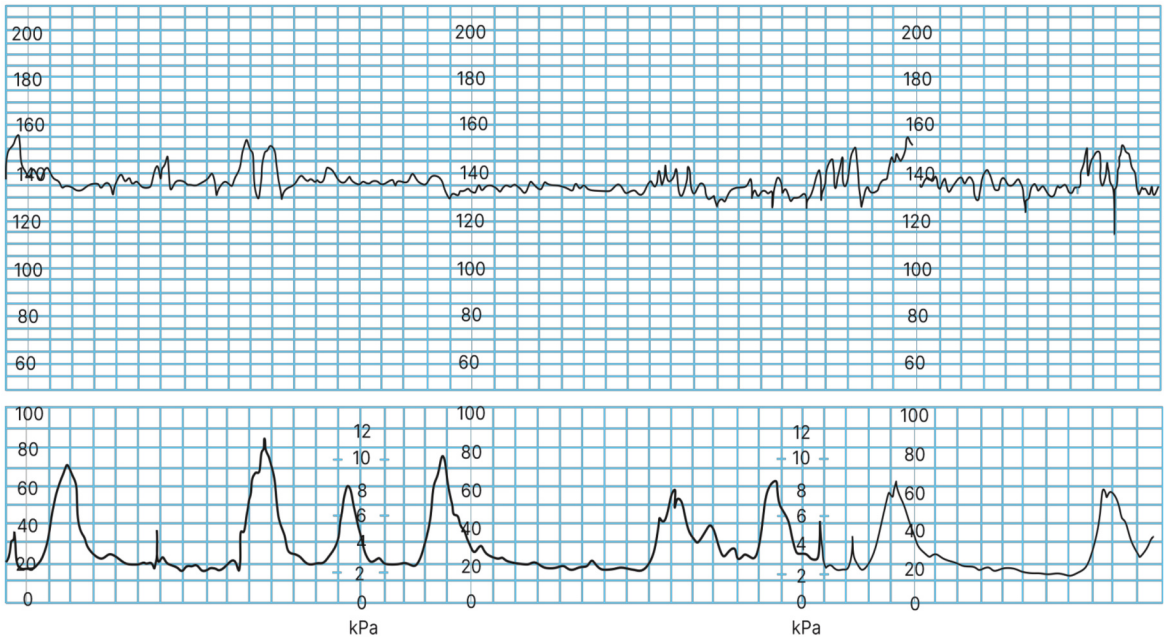
Answer:

- No CPD
- Pelvis adequate
- Fetus well
- All instrumental criteria met

BIG QUESTION 16: How is cardiotocography (CTG) used in labor and what do different fetal heart rate patterns indicate?

Broad Answer: Cardiotocography (CTG) is a key fetal monitoring tool during labor. It evaluates fetal well-being based on heart rate variability, accelerations, decelerations, and contraction pattern.





DETAILED QUESTIONS

Q16.1: What are the normal parameters of a CTG trace?

Answer:

- Baseline FHR: 110-160 bpm
- Beat-to-beat variability: 5-25 bpm
- No decelerations
- Accelerations may or may not be present

Q16.2: What are accelerations?

Answer:

- Transient increase in FHR above baseline
- 32 weeks: ≥15 bpm lasting ≥15 sec
- <32 weeks: ≥10 bpm lasting ≥10 sec

Q16.3: What is the SI unit for intensity of uterine contractions?

Answer: **Montevideo units** = No. of contractions in 10 min × average intensity

Q16.4: What are causes of fetal tachycardia (>160 bpm)?

Answer:

- Maternal fever
- Maternal infections (e.g. chorioamnionitis)

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Q16.5: What are causes of fetal bradycardia (<110 bpm)?

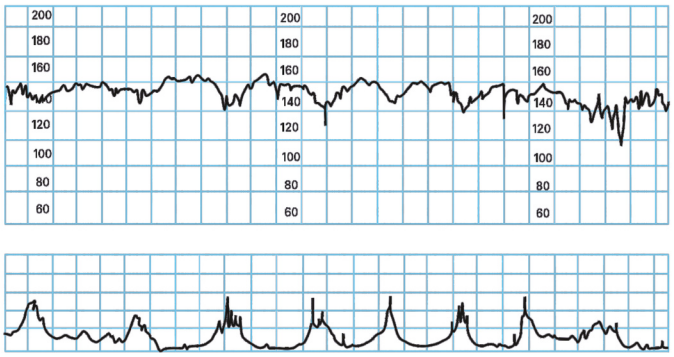
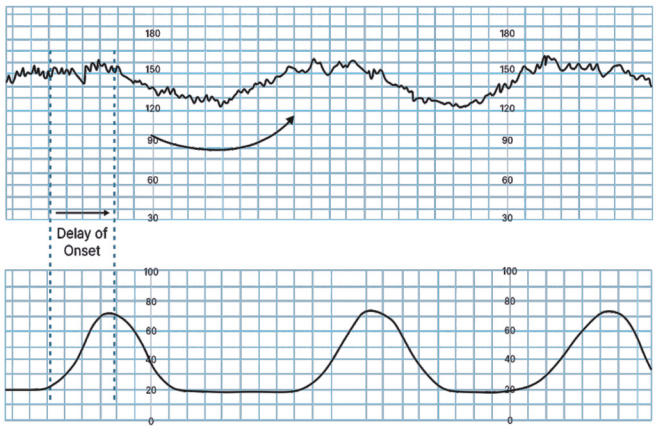
Answer:

- Maternal hypotension (e.g. placental abruption)
- Tetanic contractions
- Maternal hypoxia
- Cord prolapse

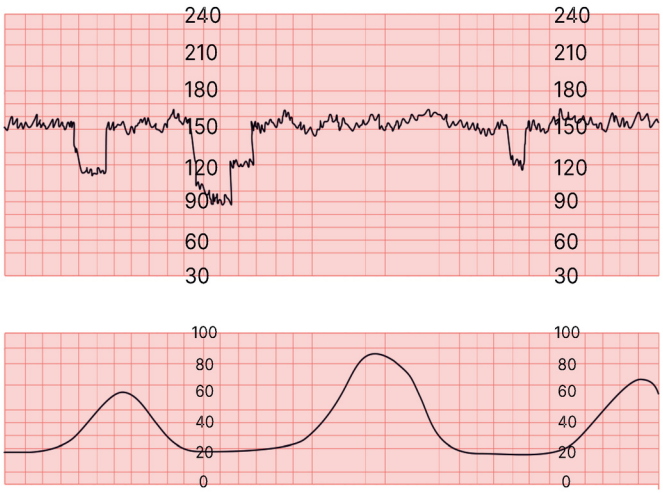
Q16.6: What are decelerations and how are they classified?

Answer:

- Transient decrease in FHR below baseline
- ≥15 bpm for ≥15 sec
- Types:

Early (type I) decelerations	• Decelerations are the mirror image of uterine contractions • Associated with fetal head compression	
Late (type II) decelerations	• Delay in onset of deceleration • Delayed recovery • Associated with: o Fetal hypoxia: Chemoreceptor mediated o Uteroplacental insufficiency • Conditions: o Excessive uterine contractions o Maternal hypotension o Dehydration o Epidural	

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Variable decelerations	• Abrupt decrease in FHR
	• Not related to contractions
	• Due to cord compression
	• Baroreceptor-mediated
	• More likely with:
	  o Post-term
	  o Oligohydramnios
	  o Malpresentation
	• Concerning features:
	  o Decreased variability with no shoulders
	  o Depth of >60 beats/min
	  o Lasting for >60 secs
	• Persistent variable deceleration "in labor" is the only role of Amnioinfusion
	• Causes of decreased variability:
	  o Prematurity
	  o Fetal sleep
	  o Fetal hypoxia
	  o Fetal infection
	  o Analgesic drugs in labor
	  o Corticosteroids
	  o Magnesium sulphate
		

Q16.7: What are prolonged decelerations?

Answer: Lasting ≥2 min but <10 min

Q16.8: What are concerning features of variable decelerations?

Answer:

- Decreased variability with no shoulders
- Depth >60 bpm
- Duration >60 sec
- Persistent variables → Indication for amnioinfusion

Q16.9: What are causes of decreased beat-to-beat variability?

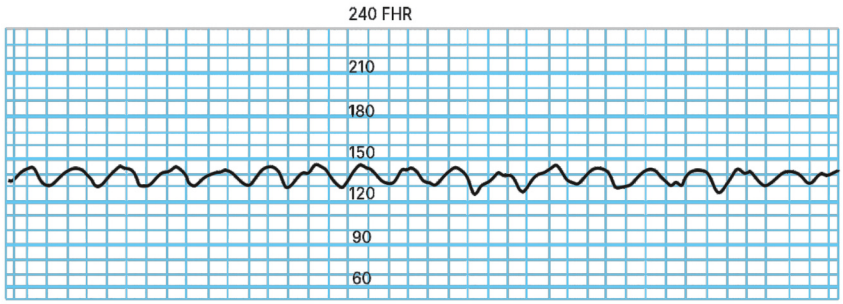
Answer:

- Prematurity
- Fetal sleep
- Hypoxia
- Fetal infection
- Analgesics in labor
- Corticosteroids
- Magnesium sulfate

Q16.10: What is a sinusoidal baseline pattern?

Answer:

- Absent variability
- No accelerations
- Sine wave pattern
- Associated with:
  - Severe fetal anemia
  - Rh isoimmunization
  - Twin-to-twin transfusion
  - Fetomaternal hemorrhage
  - Vasa previa bleeding
  - Fetal intracranial hemorrhage



BIG QUESTION 17: How are CTG traces categorized and what are the prerequisites and complications of instrumental delivery?

Broad Answer: CTG traces are divided into three categories for decision-making. Instrumental delivery requires strict criteria, and both forceps and vacuum have specific indications and complications.

DETAILED QUESTIONS

Q17.1: What are the CTG trace categories?

Answer:

Category	Features	Action
Category 1	Normal baseline and variability; accelerations +/-; no decelerations	Reassure and continue monitoring
Category 2	Does not fit into category 1 or 3	Inform senior
Category 3	Absent variability with bradycardia, recurrent late/variable decelerations, or sinusoidal pattern	Expedite delivery, resuscitation

Q17.2: What are resuscitative measures for abnormal CTG?

Answer:

- Shift to left lateral position
- Oxygen by mask
- Stop oxytocin
- IV fluids
- Per vaginal exam to plan delivery

Q17.3: What are prerequisites for instrumental vaginal delivery?

Answer:

- Fully dilated cervix
- Vertex presentation (OA/OP)
- Head rotated, membranes ruptured
- CPD ruled out
- Consent taken
- Head engaged, bladder empty

- Station: +2 or more
- Experienced operator available

Q17.4: What are absolute contraindications to instrumental delivery?

Answer:

- CPD
- Inadequate pelvis
- Known fetal coagulopathy or bony deformity

Q17.5: What are special indications for forceps use?

Answer:

- Preterm head
- Mento-anterior face
- After-coming head of breech
- Dead fetus

Q17.6: What are maternal and fetal complications of forceps?

Answer:

- Maternal: Perineal injury
- Fetal: Brachial plexus injury, eye injury, facial nerve injury, depressed skull fracture

Q17.7: What are complications of vacuum delivery?

Answer:

- Retinal hemorrhage
- Cephalohematoma
- Subgaleal hemorrhage
- Acute perinatal injuries

Q17.8: In maternal heart disease, which instrument is preferred?

Answer: Forceps preferred over vacuum

Q17.9: What is Chignon and when is it seen?

Answer: Scalp swelling caused by vacuum with metallic cups

BIG QUESTION 18: How do Caput Succedaneum and Cephalhematoma differ, and what are the key delivery maneuvers and forceps techniques?

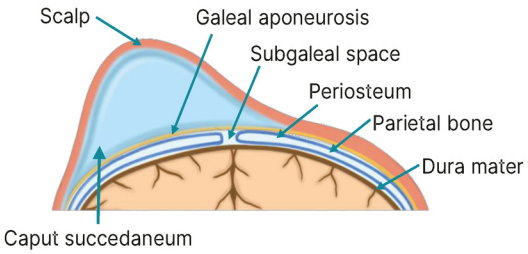
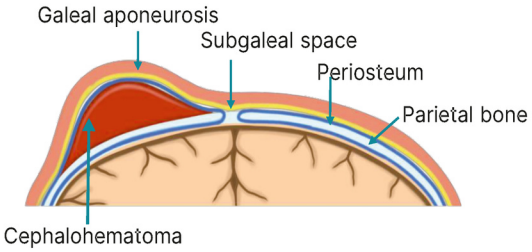
Broad Answer: Caput and cephalhematoma are neonatal scalp swellings with distinct causes and clinical features. Delivery maneuvers and correct forceps application techniques minimize maternal and fetal trauma.

DETAILED QUESTIONS

Q18.1: What is the difference between caput succedaneum and cephalhematoma?

Answer:

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Feature	Caput Succedaneum	Cephalhematoma
Location	Scalp above periosteum	Subperiosteal space
Crosses sutures	Yes	No
Appearance	Immediately after birth	Increases in 1st few hours
Content	Edema	Blood collection
Resolution	Within 24-48 hrs	Gradual over days to weeks
		

Q18.2: What is the flexion point for vacuum application?

Answer:

- 3 cm in front of posterior fontanelle
- 6 cm behind anterior fontanelle

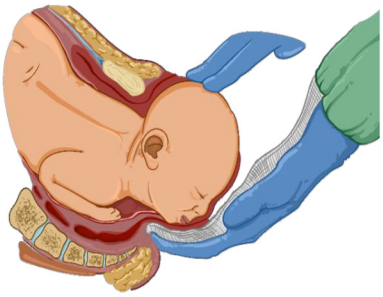
Q18.3: What is Wrigley's forceps used for?



Answer:

- Outlet forceps application:
  - Scalp visible at introitus
  - Head at pelvic floor and perineum
  - Blades equidistant from sutures

Q18.4: What is the Ritgen maneuver?



Answer:

- Controlled delivery of head by extension between contractions
- Suboccipitofrontal diameter distends vulva

Q18.5: How can perineal injury be minimized during delivery?

Answer:

- Controlled delivery of head
- Perineal massage
- Perineal support
- Warm, wet compresses
- Routine episiotomy not recommended

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Q18.6: What is the best timing and angle for episiotomy?

Answer:

- At crowning
- Preferred: Mediolateral
- Angle from midline: 60°

Q18.7: What muscles are cut and spared in episiotomy?

Answer:

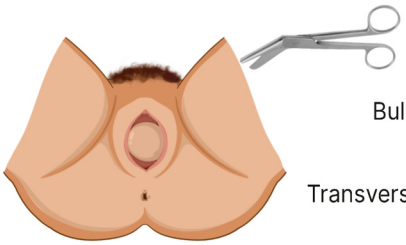
- Muscles cut: Bulbospongiosus, transverse perineal, levator ani
- Not cut: Ischiocavernosus

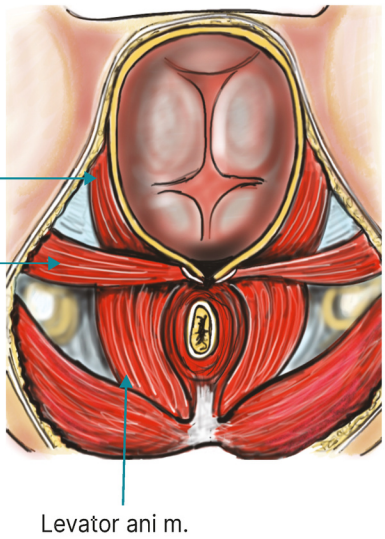
Q18.8: What is the sequence of episiotomy repair?

Answer:

1. Vaginal mucosa
2. Perineal muscle
3. Skin

- Use absorbable suture (e.g., Vicryl rapid)





BIG QUESTION 19: How is the third stage of labor managed and postpartum hemorrhage (PPH) prevented?

Broad Answer: The third stage involves placental delivery and hemostasis. Active management reduces PPH risk and involves uterotonics, cord traction, and uterine massage.

DETAILED QUESTIONS

Q19.1: What are the steps of the third stage of labor?

Answer:

- Begins after delivery of fetus
- Ends with expulsion of placenta and membranes

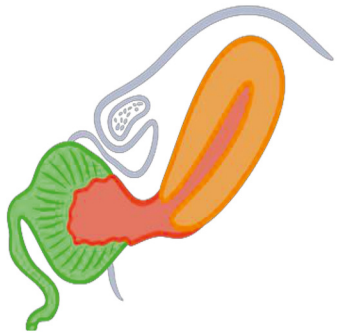
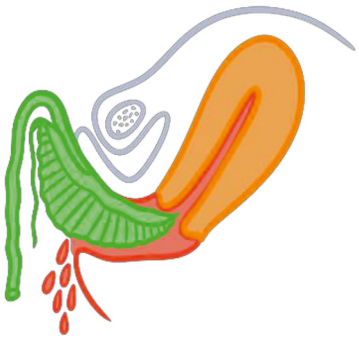
Q19.2: What are signs of placental separation?

Answer:

- Gush of blood
- Lengthening of cord
- Rising uterus
- Firm and globular uterus

Q19.3: What are methods of placental separation?

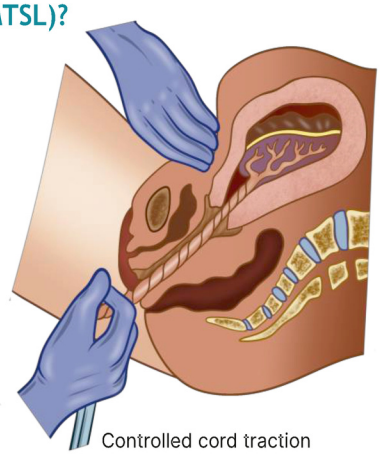
Answer:

Schultze mechanism (80%): Central separation, fetal side visible	**Matthews Duncan:** Marginal separation, maternal side visible
	

Q19.4: What are the components of Active Management of Third Stage of Labor (AMTSL)?

Answer:

1. Uterotonic (within 1 min of delivery)
2. Controlled cord traction
3. Uterine massage



Controlled cord traction

Q19.5: What are the preferred uterotonics in AMTSL, compare their doses with that used in PPH and what are their specific side effects?

Answer:

DRUG	AMTSL	PPH	S/E	
Oxytocin	10 units IM/IV infusion	20 units in 500 ml IV infusion (In RL/NS)	• Hypotension • Tachycardia, • Water intoxication	• Oxytocin is stored at 2-8°C • T ½: 3-5 mins • Never given IV bolus
Methergin	0.2 mg IM/IV	same	• HTN • Vasoconstriction, • **Risk of retained placenta**	**Contraindications:** • HTN • Preeclampsia • Cardiac disease • Peripheral vascular diseases • HIV+ on Protease inhibitors • Before delivery of 2nd twin • Rh -ve mother (relative C/I - in PPH)
Misoprostol	400 - 600 µg orally	800 µg sublingual	Fever, shivering, nausea, vomiting, diarrhea	
Carbetocin	100 µg IM or slow IV	Not recommended		Long-acting (**Octapeptide analogue** of Oxytocin)

Syntometrine		Not recommended		Oxytocin+ Methergine
Carboprost (Hemabate) - PGF2α	Not recommended	250 µg IM every 15 min (max 8 doses - 2 mg)	Diarrhea, nausea, vomiting, bronchoconstriction	Contraindications: **Bronchial Asthma**

Q19.6: What are the causes of PPH and their management?

Answer:

- Causes: Tone, Trauma, Tissue, Thrombin
- First steps: Uterine massage, uterotonics
- Advanced options: Balloon tamponade, B-Lynch suture, vessel ligation, hysterectomy

Q19.7: What drug is given to reduce blood loss in PPH prophylaxis?

Answer: Tranexamic acid (TXA)

BIG QUESTION 20: What is the fourth stage of labor and what key labor-related values should be remembered?

Broad Answer: The fourth stage involves observation and monitoring immediately post-delivery. It is crucial for early detection of PPH or maternal instability. Key obstetric measurements help in safe labor management.

DETAILED QUESTIONS

Q20.1: What defines the fourth stage of labor?

Answer:

- First hour after delivery of placenta
- Observation for hemorrhage, uterine tone, vitals

Q20.2: What should be monitored during the fourth stage?

Answer:

- Pulse, BP
- Uterine tone
- Vaginal bleeding

Q20.3: What are the key diameters and labor values to remember?

Answer:

Parameter	Value
Bitemporal	8 cm
Biparietal	9.5 cm
Suboccipitobregmatic	9.5 cm (engaging diameter)
Mentovertical	14 cm (largest)
Obstetric conjugate	10-10.5 cm
Diagonal conjugate	12 cm

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Interspinous diameter	Smallest true pelvis diameter
Subpubic angle	85°
Active labor onset	WHO: 5 cm, ACOG: 6 cm
Normal contraction intensity	~40 mmHg
Tachysystole	>5 contractions/10 min
Normal FHR baseline	110-160 bpm

Q20.4: What are important labor milestones and limits?

Answer:

- Prolonged latent phase:
  - Primigravida: >20 hrs
  - Multigravida: >14 hrs
- Active phase arrest: ≥6 cm + no dilation in 4 hrs
- 2nd stage duration:
  - Primi: up to 3 hrs
  - Multi: up to 2 hrs

BIG QUESTION 21: What are Obstetric Anal Sphincter Injuries (OASIS), and how are they classified and managed?

Broad Answer: OASIS refers to 3rd and 4th degree perineal tears involving anal sphincter complex. Accurate classification and repair are essential to prevent long-term morbidity.

DETAILED QUESTIONS

Q21.1: What classifies as OASIS?

Answer: 3rd and 4th degree perineal tears

Q21.2: What are the degrees of perineal tears?

Answer:

- 1st degree: Vaginal mucosa
- 2nd degree: Perineal muscle (not anal sphincter)
- 3rd degree:
  - a: <50% external anal sphincter (EAS) torn
  - b: >50% EAS torn
  - c: Internal anal sphincter (IAS) torn
- 4th degree: Involves EAS + IAS + rectal mucosa

Q21.3: How are OASIS repaired?

Answer:

- In OT under anesthesia
- Antibiotics, laxatives, pain relief, follow-up

BIG QUESTION 22: What is shoulder dystocia and how is it managed?

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Broad Answer: Shoulder dystocia is a delivery emergency when shoulders fail to deliver after head due to impaction. It requires immediate maneuvers to avoid neonatal morbidity.

DETAILED QUESTIONS

Q22.1: What defines shoulder dystocia?

Answer:

- Failure of shoulders to deliver after head
- Turtle sign (head retracts against perineum)

Q22.2: What are risk factors for shoulder dystocia?

Answer:

- Macrosomia
- Maternal diabetes
- Obesity
- Postdated pregnancy

Q22.3: What is the first step in managing shoulder dystocia?

Answer:

- Call for help
- McRoberts maneuver
- Suprapubic pressure

Q22.4: What are internal maneuvers used?

Answer:

- Rubin II: Pressure on accessible shoulder to rotate
- Woods corkscrew: Rotate posterior shoulder
- Delivery of posterior arm
- Gaskin (all-fours) position

Q22.5: What is Zavanelli maneuver?

Answer:

- Cephalic replacement and cesarean delivery
- Done last

Q22.6: What are fetal complications of shoulder dystocia?

Answer:

- Brachial plexus injury (Erb's palsy)
- Clavicle fracture
- Fetal hypoxia

BIG QUESTION 23: When is intrapartum antibiotic prophylaxis indicated?

Broad Answer: Antibiotics during labor prevent neonatal sepsis, especially from GBS and certain high-risk scenarios. Indications and agents depend on risk profile.

DETAILED QUESTIONS

Q23.1: What are the indications for intrapartum antibiotic prophylaxis?

Answer:

- PROM ≥18 hrs
- GBS colonization
- Maternal fever
- Preterm labor
- Previous GBS infant

Q23.2: What antibiotics are used?

Answer:

- Penicillin (first line)
- Ampicillin
- If allergic:
  - Cefazolin (low-risk)
  - Clindamycin or vancomycin (high-risk)

BIG QUESTION 24: What are the key features of breech presentation?

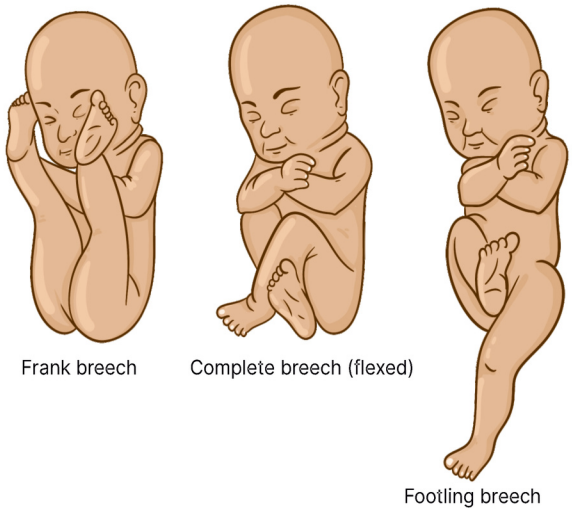
Broad Answer: Breech presentation refers to buttocks or feet presenting first. It has various types and associated risks in vaginal delivery.

DETAILED QUESTIONS

Q24.1: What are types of breech presentation?

Answer:

- Frank breech: Thighs flexed, legs extended
- Complete breech: Thighs & knees flexed
- Footling breech: One/both feet presenting



Frank breech Complete breech (flexed) Footling breech

Q24.2: What is the common type of breech in multigravida?

Answer: Complete breech

Q24.3: What is the most common type of breech in primigravida?

Answer: Frank breech

Q24.4: What are the risks associated with breech?

Answer:

- Cord prolapse
- Head entrapment
- Fetal trauma

BIG QUESTION 25: How is breech presentation clinically managed?

Broad Answer: Management depends on gestation, fetal weight, parity, and presence of complications. External cephalic version (ECV) and cesarean section are mainstays.



DETAILED QUESTIONS

Q25.1: When is ECV done?

Answer:

- After 36 weeks

Criteria:

1. Singleton fetus
2. Pelvis adequate
3. Placenta is not low lying
4. Liquor - adequate
5. Healthy fetus (No GCA)
6. No preeclampsia/HTN

Q 25.2: What are the absolute and relative contraindications of ECV?

Answer:

ABSOLUTE CONTRAINDICATION	RELATIVE CONTRAINDICATION
• Placenta previa • Inadequate pelvis • Multiple pregnancy • Preeclampsia • Oligohydramnios • Post-term • Known uterine structural anomaly • IUGR with deranged doppler	• Macrosomia • Previous caesarean section

Q 25.3: What are the complications of ECV?

Answer:

1. Cord compression
2. Cord entanglement
3. Placental abruption
4. Risk of FMH

Q 25.4: What is the next step if there is fetal distress during ECV or when ECV is unsuccessful or in case it failed?

Answer:

- If fetal distress during ECV → Stop the procedure and revert back.
  - o If distress persists → Emergency caesarean section
- If ECV is successful → No need for routine IOL
- If failed → Persistent breech → Elective caesarean section
  - o Planned at 39 completed weeks

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Q 25.5: When is cesarean preferred in breech?

Answer:

- Footling breech
- Hyperextended head
- Big baby
- Previous cesarean
- Primigravida

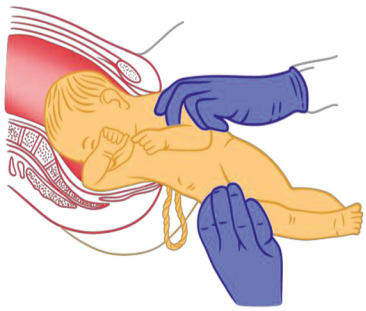
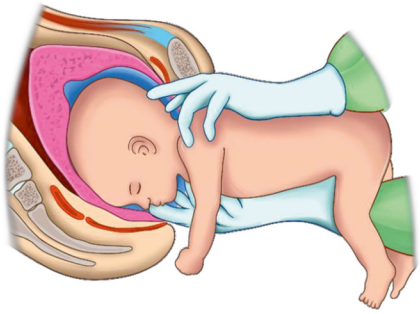
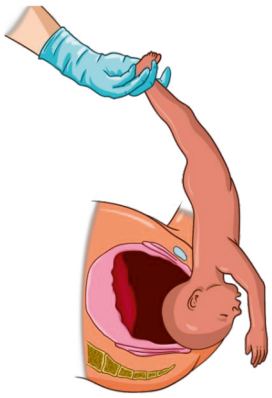
Q 25.6: What are the conditions where cesarean is preferable?

Answer:

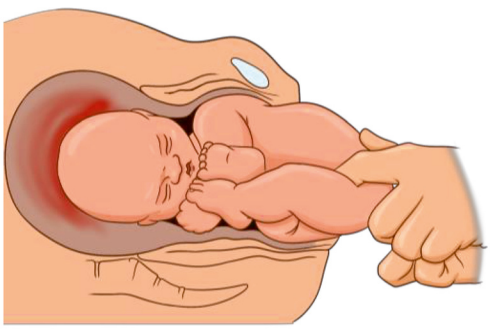
1. Large fetus - EFW >3800-4000 gm
2. Apparently healthy & viable preterm fetus either in active labor or indicated preterm
3. Fetal anomaly incompatible with vaginal delivery
4. Severe FGR
5. Macrosomia
6. Previous CS
7. H/o prior perinatal death
8. Patient request

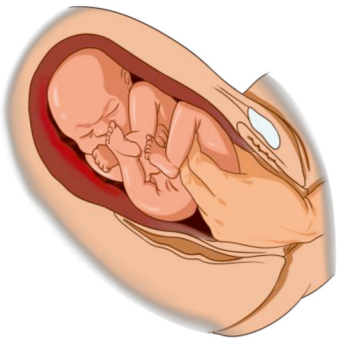
Q25.7: What are maneuvers for assisted breech delivery?

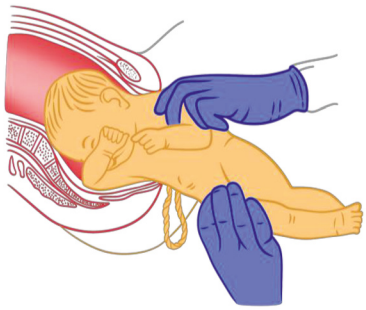
Answer:

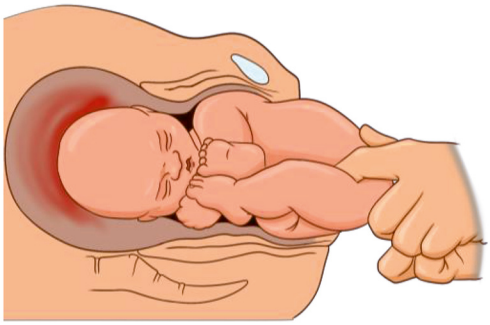
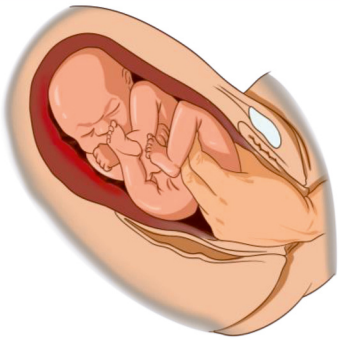
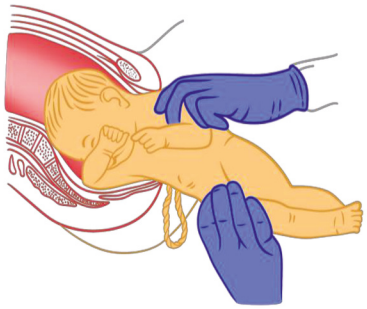
Lovset's: Rotate to deliver arms	Mauriceau-Smellie-Veit: Deliver head	Burns-Marshall: Swing baby for delivery
		

Q 25.8: Identify the given images.



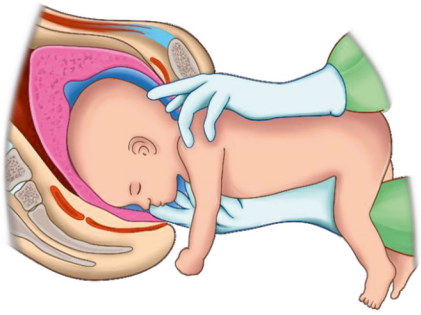
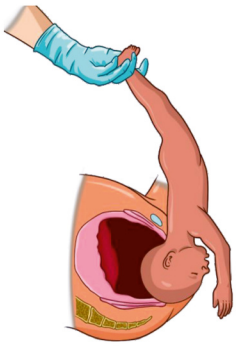
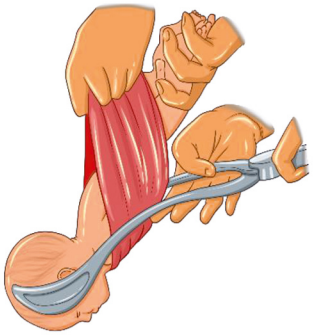




		
Groin traction • For delivery of buttocks	**Pinard's maneuver** • For extended legs	**Loveset's maneuver** • For extended arms

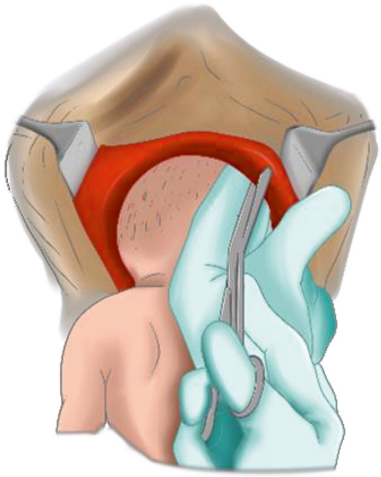
Q 25.9: What are the manoeuvres used in the delivery of the aftercoming head?

Answer:

DELIVERY OF AFTERCOMING HEAD		
		
Mauriceau-Smellie-Veit • Malar flexion & shoulder traction	**Burns Marshall**	**Piper forceps** • Pelvic curve is absent • Max protection to neck

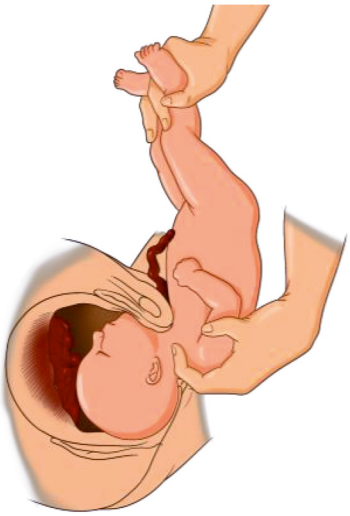
Durrhsen's incision

- Avoid at 3 o'clock and 9 o'clock position



Prague's maneuver

- Delivery of aftercoming head in dorsoposterior position



BIG QUESTION 26: How is twin labor managed and what are the key delivery considerations?

Broad Answer: Twin labor management depends on presentation, chorionicity, and gestation. Mode of delivery is guided by presentation of the first twin.

DETAILED QUESTIONS

Q26.1: What are delivery indications based on twin presentation?

Answer:

First Twin	Second Twin	Delivery Mode
Cephalic	Cephalic	Vaginal (preferred)
Cephalic	Non-cephalic	Vaginal + internal podalic version
Non-cephalic	Any	Cesarean section

Q26.2: What is the preferred mode for monoamniotic twins?

Answer: Elective cesarean section

Q26.3: What is the goal delivery time for diamniotic twins?

Answer: Between 36-37 weeks

BIG QUESTION 27: What is cord prolapse and how is it managed?

Broad Answer: Cord prolapse is an obstetric emergency requiring immediate recognition and expedited delivery to prevent fetal hypoxia.

DETAILED QUESTIONS

Q27.1: What are the types of cord prolapse?

Answer:

- Overt: Cord visible at vulva
- Occult: Cord felt beside presenting part
- Funic: Cord below presenting part before rupture

Q27.2: What are risk factors?

Answer:

- Malpresentation
- Prematurity
- Polyhydramnios
- Long cord

Q27.3: What is the immediate management?

Answer:

- Elevate presenting part
- Knee-chest or Trendelenburg position
- Tocolytics (e.g., terbutaline)
- Emergency cesarean delivery

BIG QUESTION 28: What is uterine rupture and how is it identified and managed?

Broad Answer: Uterine rupture is a life-threatening obstetric complication more common in scarred uterus. Early diagnosis and surgery are critical.

DETAILED QUESTIONS

Q28.1: What are risk factors for uterine rupture?

Answer:

- Previous cesarean scar
- Overdistension
- Obstructed labor

Q28.2: What are clinical signs of rupture?

Answer:

- Sudden pain
- Cessation of contractions
- Recession of fetal head (loss of station)
- Fetal distress or death

Q28.3: What is the management?

Answer:

- Emergency laparotomy
- Repair if feasible or hysterectomy

BIG QUESTION 29: What are the considerations for Vaginal Birth After Cesarean (VBAC)?

Broad Answer: VBAC is possible under strict criteria in women with prior cesarean. Uterine rupture risk guides selection.

DETAILED QUESTIONS

Q29.1: What are criteria favoring VBAC?

Answer:

- 1 previous LSCS
- Spontaneous labor
- Cephalic presentation
- Adequate pelvis
- No other risk factors

Q29.2: What are contraindications to VBAC?

Answer:

- Classical scar
- Prior uterine rupture
- Unknown scar with no prior vaginal delivery

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BIG QUESTION 30: How is post-term pregnancy defined and managed?

Broad Answer: Post-term pregnancy is >42 weeks and carries risks of macrosomia, stillbirth, and meconium. Monitoring and timely induction are essential.

DETAILED QUESTIONS

Q30.1: What defines post-term pregnancy?

Answer: Pregnancy >42 weeks

Q30.2: What are complications?

Answer:

- Oligohydramnios
- Meconium aspiration
- Macrosomia
- Stillbirth

Q30.3: What is the management?

Answer:

- Weekly NST and AFI after 40 weeks
- Induction of labor at 41 weeks

BIG QUESTION 31: What is a transverse lie and how is it managed?

Broad Answer: Transverse lie is an abnormal fetal presentation where the fetal long axis is perpendicular to the maternal spine. It increases the risk of cord prolapse and obstructed labor.

DETAILED QUESTIONS

Q31.1: What are the causes of transverse lie?

Answer:

- Grand multiparity
- Polyhydramnios
- Placenta previa
- Fetal anomalies
- Pelvic tumors

Q31.2: What is the clinical presentation?

Answer:

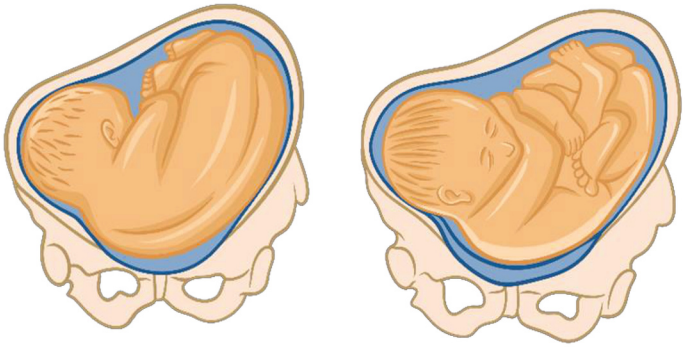
- Empty lower pole on palpation
- Broad uterus
- Fundus may have head or breech
- No presenting part on vaginal exam

Q31.3: What is the denominator and position?

Answer:

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- Denominator: Acromion
- Common positions: Left scapuloanterior (LSA), Right scapuloanterior (RSA)



Dorsoanterior Dorsoposterior

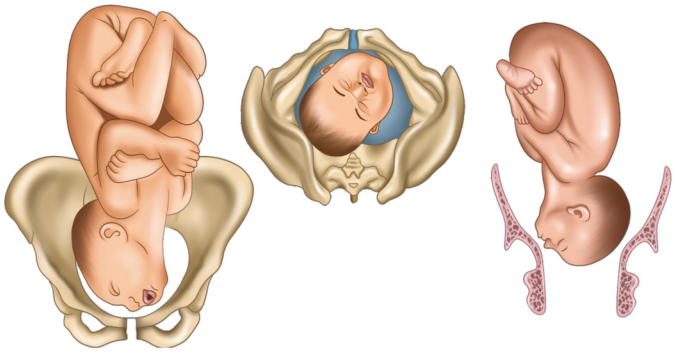
Q31.4: What is the management?

Answer:

- Before labor: External cephalic version if no contraindications
- In labor: Cesarean section (definitive)
- Internal podalic version and breech extraction: Only for second twin

BIG QUESTION 32: What is face presentation and how is it managed?

Broad Answer: Face presentation occurs when the fetal head is fully extended, and the face becomes the presenting part. Its management depends on the position of the chin (mentum).



DETAILED QUESTIONS

Q32.1: What is the denominator in face presentation?

Answer: Mentum (chin)

Q32.2: How is face presentation diagnosed?

Answer:

- Vaginal exam: Nose, mouth, malar prominences
- Hard palate and gums may be felt

Q32.3: What is the engaging diameter in face presentation?

Answer: Submentobregmatic: 9.5 cm

Q32.4: What is the mechanism of labor in face presentation?

Answer: Same steps as vertex: Descent, internal rotation, extension (face-to-pubis delivery)

Q32.5: When is vaginal delivery possible in face presentation?

Answer: Mentum anterior position

Q32.6: When is cesarean section indicated?

Answer: Mentum posterior position (cannot rotate under pubic symphysis)

BIG QUESTION 33: What is brow presentation and how is it managed?

Broad Answer: Brow presentation is partial extension of the fetal head. It has the largest presenting diameter and typically requires cesarean delivery.

DETAILED QUESTIONS

Q33.1: What is the engaging diameter in brow presentation?

Answer: Mentovertical: 14 cm

Q33.2: How is brow presentation diagnosed?

Answer:

- Vaginal exam: Anterior fontanelle and orbits felt
- May feel root of nose and supraorbital ridge

Q33.3: What is the management of brow presentation?

Answer:

- Cesarean section (almost always)
- Vaginal delivery only possible if presentation converts to face or vertex

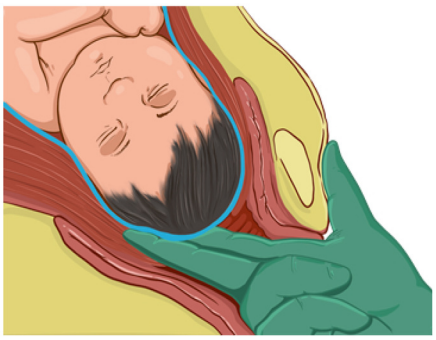
BIG QUESTION 34: What agents and methods are used for cervical ripening, and how is induction of labor evaluated?

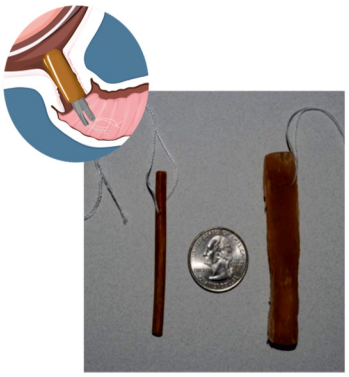
Broad Answer: Cervical ripening facilitates labor induction by softening and dilating the cervix. Both pharmacologic and mechanical methods are used. The Bishop Score evaluates cervical readiness. Contraindications guide safe use of induction.

DETAILED QUESTIONS

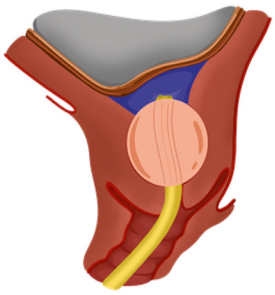
Q34.1: What agents favor cervical ripening?

Answer: Stripping of membranes





- Transcervical Foley catheter insertion (especially good in previous cesarean)



- **PGE2 (Dinoprostone):**
  - Cerviprime gel (0.5 mg)
  - Cervidil insert (10 mg): releases 0.3 mg/hr





- **Laminaria tents** (hygroscopic dilators used in 2nd trimester MTPs)
- **PGE2 Insert**
  - Cervidil 10 mg
  - Releases at 0.3 mg/hr

Q34.2: What are the pharmacological methods for cervical ripening?

Answer:

- **Dinoprostone (PGE2)**
- **Misoprostol (PGE1):**
  - Contraindicated in previous cesarean >28 weeks
- **Mifepristone:** Used in 2nd trimester MTP
- **Oxytocin**
- **Hyaluronic acid** - not clinically used
- **Nitric oxide donors** - not clinically used

Q34.3: What are the contraindications to induction of labor?

Answer:

- **Maternal:**
  - Diabetes with EFW >4.5 kg
  - No diabetes with EFW >5 kg
  - HIV-positive women
  - Active genital herpes
  - Cervical cancer
  - Previous classical CS or 2 previous LSCS
  - Inadequate pelvis
- **Fetal:**
  - Placenta previa
  - Significant macrosomia
  - Malpresentation (e.g., mentoposterior, transverse lie)
  - Non-reassuring fetal status
  - Brow presentation

Q34.4: What are precautions regarding artificial rupture of membranes (ARM)?

Answer:

- Avoid ARM in:
  - HIV-positive women
  - Active genital herpes
- Controlled ARM can be done in:
  - Free-floating head
  - Polyhydramnios

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Q34.5: What is the Bishop score and how is it used?

Answer:

- **Total Score:** Maximum 13
- **Score ≥6:** Favorable cervix
- **Modified Bishop Score:** Uses cervical length on TVS instead of effacement
- **Simplified Bishop Score:** Only dilatation, effacement, and station; max score 9
- **Score ≥5:** Favorable for induction

Component	Score 0	Score 1	Score 2	Score 3
Dilatation	Closed	1-2 cm	3-4 cm	≥5 cm
Effacement	0-30%	40-50%	60-70%	≥80%
Station	-3	-2	-1/0	+1/+2
Consistency	Firm	Medium	Soft	
Position	Posterior	Mid	Anterior	

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YOURWISH

11. OBSTETRIC HAEMORRHAGE AND COMPLICATIONS

BIG QUESTION 1: What are the risk factors for placenta previa?

Broad Answer: Risk factors:

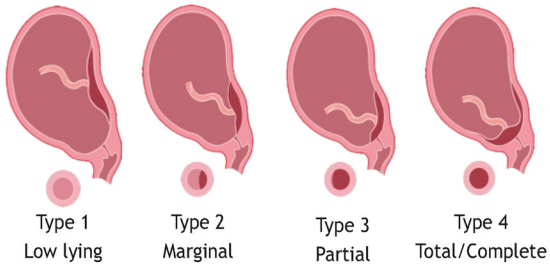
- Increasing age and parity
- Smoking
- Past h/o placenta previa, previous cesarean section
- Multiple pregnancy
- Uterine structural anomalies
- Scarring of uterus due to other surgeries (myomectomy, multiple D&C)

DETAILED QUESTIONS

Q1.1: What are the clinical management guidelines for a low-lying placenta near the internal os?

Answer: Placental edge within 2 cm of internal os (low-lying) → Always cesarean section

PYQ: FMGE 2022, 2023



Q1.2: What is the management of placenta previa?

Answer: Partially or totally covering internal os → Cesarean section

Q1.3: What is Stallworthy sign?

Answer: Decrease in FHS as head descends down.

- Seen in Type 2 posterior placenta

BIG QUESTION 2: What is placental abruption?

Broad Answer: Premature separation of normally situated placenta.

- Bleeding in the decidua basalis
- Maternal bleeding (in both placenta previa and placental abruption)

DETAILED QUESTIONS

Q2.1: What are the types of placental abruption?

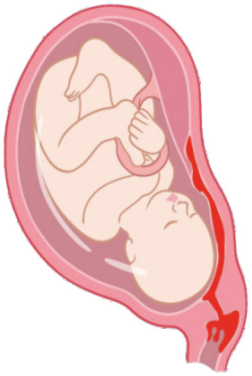
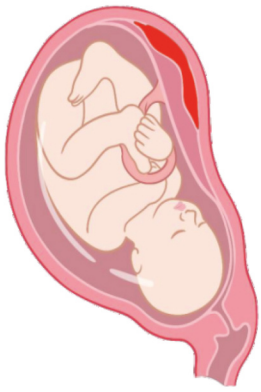
PYQ: FMGE 2019, 2020, 2021, 2023

PYQ: INICET 2022

PYQ: AIIMS 2020

Answer: Types:

- Revealed Abruption
- Concealed Abruption
- Mixed Type **(m/c type)**

Revealed Abruption	Concealed Abruption
Visible bleeding	• No visible bleeding • Blood collecting behind the placenta in form of retroplacental clot • Most dangerous (more risk of DIC) • Increased release of placental thromboplastin
	

Q2.2: What is the most common cause of DIC in obstetrics?

Answer: Placental abruption

- Placental abruption is more common than placenta previa

Q2.3: What are the risk factors for placental abruption?

Answer: Risk factors:

- Increasing age and parity
- Smoking
- Hypertension, preeclampsia
- Abdominal trauma
- APLA
- Polyhydramnios
- PROM

Q2.4: What is the clinical classification of severity of placental abruption?

Answer: Page Classification

- Mildest form of abruption is mosty identified and diagnosed after delivery

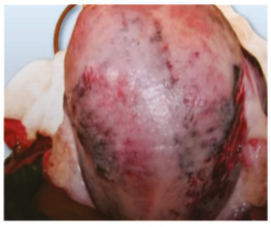
Q2.5: How does increasing placental separation impact the mother and fetus?

Answer: As the degree of placental separation increases → Maternal bleeding increases → Maternal decompensation → Fetal distress.

Q2.6: How is the Couvelaire uterus managed?

Answer: Managed like PPH (Increased risk of atonic PPH)

- No direct hysterectomy



Couvelaire uterus

Q2.7: A 35-year-old, primigravida, hypertensive woman is seen at 35 weeks with complaints of continuous abdominal pain, bleeding P/V, and loss of fetal movements for 1 hour. Uterus corresponds to POG, contractions are present with increased uterine tone. FHR is 120/min. What is the most likely diagnosis?

Answer: Placental abruption

- Polyhydramnios: Fundal height > POG
  - Uterus: Tense
  - Difficult to palpate FHR
  - Shiny overlying skin
  - No increased uterine tone
- Placenta previa: Presents with painless, causeless bleeding.

BIG QUESTION 3: What is antepartum hemorrhage?

Broad Answer: Bleeding from or into the genital tract after the period of viability but before the delivery of baby.

- Can present even during the labor also but before birth of the baby.

DETAILED QUESTIONS

Q3.1: What is the typical patient history in cases of placental abruption?

Answer: Antecedent h/o abdominal trauma/hypertension/prolonged PROM.

Q3.2: Both placenta previa and placental abruption cause antepartum hemorrhage—how can they be differentiated?

Answer: Placenta Previa vs Placental Abruption

Features	Placenta Previa	Placental Abruption
Characters of bleeding, pain and vitals	• Painless, causeless bleeding • Bright red, fresh • 1st episode is usually a **warning hemorrhage.**	• Altered dark coloured bleeding • Pain +
Abdominal examination	**FH ~ POG** • Free-floating head • Transverse lie • Uterus relaxed • FHR usually normal	• **FH > POG (concealed)** • **Fh ~ POG (revealed)** • Uterus is tense, tender, contractions+, tone of uterus increased. • FHR can be normal (if distress present → more in favor of abruption/fetus can already be dead
P/S and P/V: Not done as 1st location of the placenta is checked.		
USG findings:	Placenta in lower uterine segment	Placenta in upper segment ± Evidence of retroplacental hematoma

Q3.3: What is the investigation of choice to differentiate between placenta previa and abruption?

Answer: USG (ultrasonography)

- Transabdominal sonography 1st, and if needed, TVS is safe

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Q3.4: What is the appropriate next step when placenta previa is excluded by ultrasound, and clinical evaluation suggests placental abruption in a woman with antepartum bleeding?

Answer: Placental abruption is a clinical diagnosis

- P/V done
- ARM → Blood-stained liquor draining (confirms diagnosis)
- ARM also helps to increase uterine contractions and augment labor

Q3.5: What is the management of placental abruption?

Answer: **Management:**

- Simultaneous resuscitation and delivery
- Conservative management (in circumstances like prematurity, completely stable patient, mild bleeding).
- Preferred route: Vaginal delivery (IOL/Augmentation depending on findings)
  - Ideally CTG monitoring should be done
  - Steroids given if < 34 weeks POG
- DIC + Abruption: Correction of DIC + Vaginal bleeding

Q3.6: What are the indications of cesarean section in placental abruption?

Answer: Indications:

- Fetal distress
- Contraindications to vaginal delivery
- Far from delivery with severe abruption

Q3.7: What is the most common fetal complication with placental abruption?

Answer: Prematurity

Q3.8: What are the indications of emergency cesarean section in placenta previa?

Answer: Indications:

- Hemodynamically unstable
- Already in labor
- Present at ≥ 37 weeks
- Fetal distress
- Dead fetus
- Non-viable fetus

Q3.9: What is the management of placenta previa?

Answer: **Management:**

- Bleeding → Admit and observe
- Conservative management (McCaffey Protocol) - If all of the following are present:
  - No active bleeding
  - Viable fetus
  - No fetal distress
  - Not in labor
- Placenta previa or low-lying placenta → Never bleeds → Schedule an elective cesarean section at 37 completed weeks.

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- Confirm low-lying placenta in Level II scan again at 32 weeks → Still low-lying placenta → Repeat scan at 36 weeks to confirm again → Still low-lying → Schedule an elective cesarean section.

Q3.10: What is McCaffey protocol?

Answer: McCaffey Protocol:

- Monitoring and rest
- Steroids if < 34 weeks
- Anti-D if Rh negative
- Tocolysis is not preferable

Q3.11: What is the most common fetal complication of placenta previa?

Answer: Increased fetal growth restriction

- Repeated bouts of bleeding during conservative management without delivery

Q3.12: A primigravida with 36 weeks of pregnancy is in labor with 3 cm dilatation and minimal uterine contraction. On rupture of membranes, fresh bleeding is noted with late fetal decelerations up to 50 beats/min. The patient was taken for LSCS, but the fetus could not be saved. The placenta was in the upper segement and there were no retroplacental clots. The likely diagnosis is?

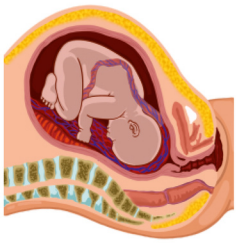
Answer: Vasa previa

- **Vasa previa:** Fetal vessels lying in front of the presenting part → Fetal bleeding
  - Can be associated with succenturiate placenta and velamentous cord insertion
- **Revealed abruption:** Maternal bleeding
  - If fetus dies in abruption → Atleast 50% of placenta has separated → 2500 ml of blood loss has occurred as bleeding is maternal → Hemodynamically unstable mother.

BIG QUESTION 4: What is Vasa Previa and its types?

Broad Answer: Naked fetal vessels travelling in the membranes and lying in front of presenting part.

- **Types:**
  - **Type I:** Associated with velamentous cord insertion
  - **Type II:** Associated with succenturiate placenta





DETAILED QUESTIONS

Q4.1: What is the bedside test to differentiate between fetal and maternal blood?

Answer: Apt Test (qualitative test)

Q4.2: What is the appropriate management when vasa previa is diagnosed antenatally?

Answer: Elective cesarean section at 34-36 weeks is recommended (progression into labor can lead to sudden fetal death).

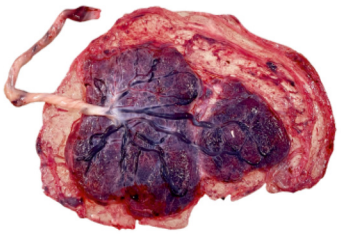
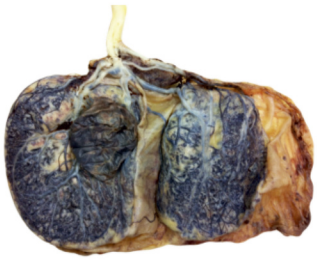
Q4.3: What are the complications associated with velamentous cord insertion?

Answer: Complications are:

- Risk of PPH
- Compression of fetal vessels → Fetal distress

Q4.4: What are some of the placental abnormalities related to morphology and cord insertion?

Answer: Placental abnormalities:

Abnormality	Image
Succenturiate Placenta • Extra lobe of placenta with leash of connecting vessels between main placenta and extra lobes. • Risk: **Retained tissue** o If big, can interfere with contractility of uterus → Atonic PPH o If small → Secondary PPH.	
Bilobed Placenta • 2 lobes are of equal size • Umbilical can be attached to one or attached at the centre.	
Circumvallate Placenta • Chorionic plate is smaller • Associated with increased risk of abortion, APH, IUGR, preterm birth.	
Marginal Cord Insertion **(Battledoor Placenta)** • During delivery of placenta → Cord avulsion, PPH, cord compression by fetal parts in utero.	
Placenta Spuria • Main placenta + Extra lobe with no leash of connecting vessels	-

BIG QUESTION 5: What is postpartum hemorrhage (PPH)?

Broad Answer: Blood loss > 500ml in a singleton vaginal delivery or blood loss > 1000ml in a twin vaginal delivery or cesarean section.

- **Types:**
  - **Primary PPH**
    → Occurs within 24 hours of delivery
  - **Secondary PPH**
    → Occurs beyond 24 hours of delivery and upto 12 weeks postpartum

DETAILED QUESTIONS

Q5.1: According to the American College of Obstetricians and Gynecologists (ACOG), how is postpartum hemorrhage (PPH) defined?

Answer: ACOG defines PPH as:

- Cumulative blood loss > 1000ml within 24 hours of delivery (irrespective of the route of delivery).
- OR any amount of blood loss with signs and symptoms of hypovolemia.

Q5.2: What is significant PPH?

Answer: Blood loss leading to fall in Hct of >10% after delivery.

Q5.3: What is the most common cause of PPH?

Answer: The most common cause of:

- **Primary PPH:** Atonic > Traumatic
- **Secondary PPH:** Retained tissue, placental site subinvolution, endometritis and placental polyps.

Q5.4: What is the management of PPH?

Answer: **Management Algorithm of PPH:**

Immediate measures:
Call for help, 2 wide IV lines
Blood investigations
Cross match
IV crystalloids
Catheterize bladder
Monitor vitals

↓

Feels the uterus on PA examination

↓

Uterus flabby: Atonic PPH → Initiate massage and uterotonics

Uterus contracted: Traumatic PPH → Explore and repair

↓

Uterotonics escalated
IV Tranexamic acid
Examine completeness of placenta and membranes
Explore cervix and vagina

↓

Uterotonics exhausted, uterus still atonic

↓

Bimanual uterine tamponade

↓

Mobilize the patient to OT Explore the uterus and genital tract

↓

Balloon uterine tamponade (in OT ideally)

↓

Surgical methods: Laparotomy

↓

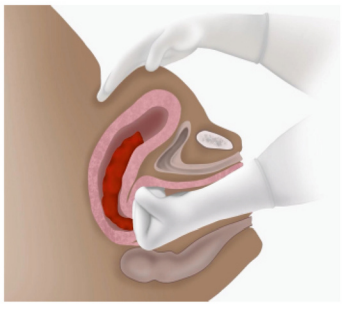
Uterus compression sutures Stepwise devascularization procedure

↓

Hysterectomy

↓

Pelvic pressure pack (parachute pack)



Bimanual uterine tamponade

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Q5.5: What is the dose of tranexamic acid used in the management of PPH?

Answer: Dose: 1g (10 ml of 100 mg/ml solution over 10 minutes)

- It is shown to decrease morbidity when given within 3 hours of diagnosis of PPH (irrespective of cause).

Uterotonics:

- PGE2 → Injectable form available in west but not recommended by WHO
- Syntometrine and Carbetocin are also not recommended by WHO for treatment of PPH

Q5.6: What is the stepwise sequence of devascularization?

Answer: Sequence:

- B/L uterine artery → B/L ovarian artery → Internal iliac artery
- Common iliac never ligated
- External iliac never ligated

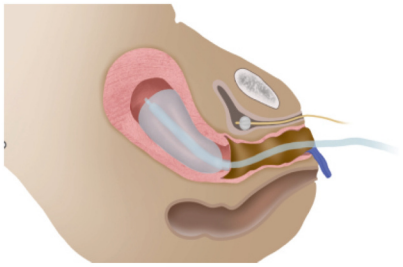
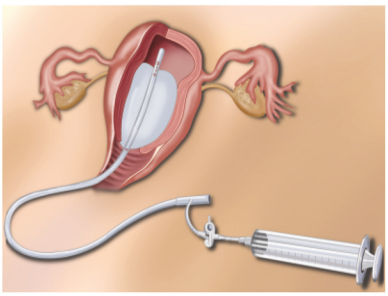
Q5.7: What is the goal of transfusion in PPH management?

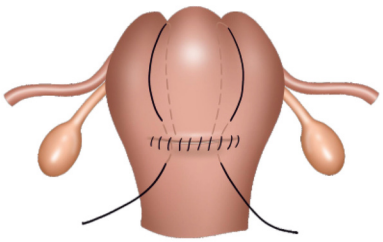
Answer: Goal of transfusion:

- Hb >8 g/dl
- Platelet count >50000
- PT and aPTT <1.5 x normal
- Serum fibrinogen levels >2 g/dl

Q5.8: What are the methods used in management of PPH?

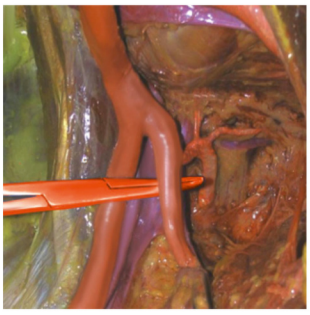
Answer: **Techniques used:**

Technique	Image
Balloon Uterin Tamponade	
Bakri Balloon • Specially designed balloon for PPH. • Filled with saline . • Capacity: 500ml.	
Condom Catheter • A device which can be made for balloon uterine tamponade in low resource settings.	

B-Lynch Uterine Compression Suture • Other uterus compression sutures are: o Hayman's compression sutures o Cho's square sutures	

Q5.9: Describe Internal Iliac Artery Ligation.

Answer: **Internal Iliac (Anterior Division) Artery Ligation:**



- Site: 5cm distal to bifurcation of common iliac artery.
  - To ensure that posterior division is spared
  - If posterior region not spared: Buttock pain (superior gluteal artery)
- Principle: Decreased pulse pressure by 85% distal to the ligation and that favors coagulation.
- Collaterals open soon after ligation so no uterus necrosis with this procedure and future fertility is also not compromised.
- To ensure that ligation of common iliac and external iliac is not done → Check the femoral and dorsalis pedis pulse.

Q5.10: What is the next best drug for a woman with preeclampsia/HTN and not responding to oxytocin?

Answer: Carboprost (PGF2 alpha)

Q5.11: Why are external aortic compression and anti-shock garments used in postpartum hemorrhage management?

Answer: External aortic compression and anti-shock garments are recommended as temporary measures till appropriate care is available.

- Utrine packing is not available

Q5.12: In which situations is uterine artery embolization not performed, despite its role in stable patients where available?

Answer: Not performed in:

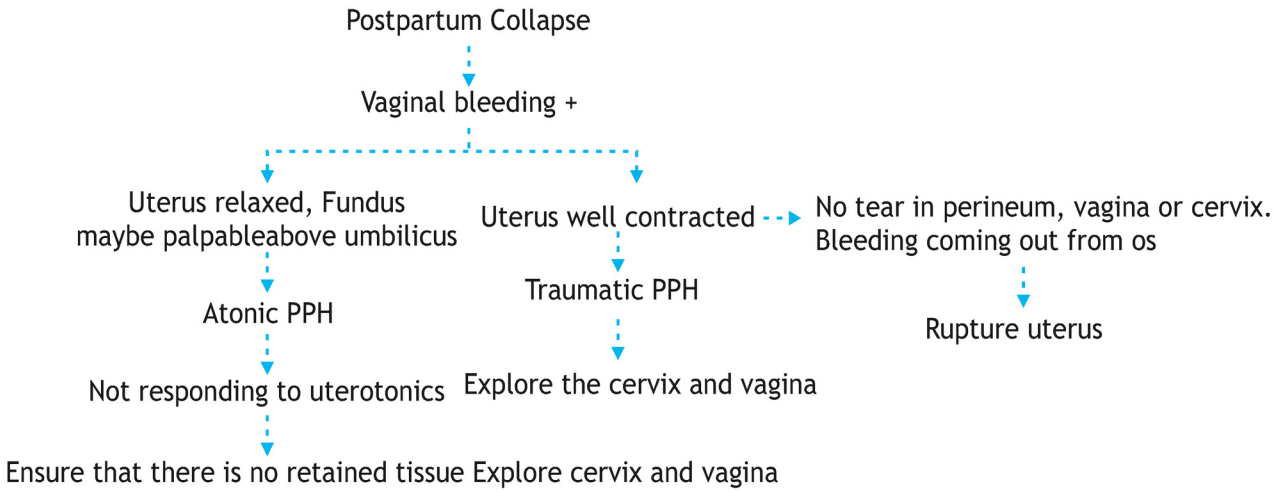
- Unstable patient
- Rapid ongoing bleeding
- Those with coagulopathy

Q5.13: A 40-year-old multiparous woman with intrauterine fetal death was admitted with strong labor pains. She collapses immediately after delivery and suddenly develops breathlessness and cyanosis; vaginal bleeding is not excessive. What is the most likely diagnosis?

Answer: Amniotic fluid embolism is essentially a clinical diagnosis of exclusion

BIG QUESTION 6: What is the clinical approach to postpartum collapse?

Broad Answer: Hemodynamic Instability Circumstances Around Delivery



DETAILED QUESTIONS

Q6.1: What is postpartum collapse?

Answer: Hemodynamic instability present

- PPH is the most common cause of postpartum collapse.

Q6.2: What is the clinical context for a ruptured uterus:

Answer: Clinical context:

- Signs and symptoms of hemoperitoneum
- H/o difficult delivery
- H/o VBAC
- Grand multipara

In this condition, some blood may trickle out and some blood may get collected in peritoneal cavity.

BIG QUESTION 7: What are the delivery-related concerns in a case of hemodynamic instability despite normal vaginal bleeding?

Broad Answer: The conditions are:

Condition	Description
Genital Hematoma	Features of hypovolemic shock: • Uterus well contracted • Perineal pain • Not passed urine
Broad Ligament Hematoma	• Hemodynamic instability • Bleeding P/V WNL • Features of hypovolemic shock • Vulva, vagina and cervix is normal • Uterus is contracted and deviated to one side • Fullness felt through fornices

Uterine Inversion	Mismanagement of 3rd stage of labor (m/c cause) Bradycardia P/A: Fundus not palpable
Pulmonary Embolism (Possibility of amniotic fluid embolism - Diagnosis of exclusion)	• H/o breathlessness/cyanosis/hypoxia • Signs and symptoms of heart failure **Rule out DVT:** • Fever • Leg swelling • History: During delivery or within 30 minutes of placental delivery

DETAILED QUESTIONS

Q7.1: How is the possibility of amniotic fluid embolism evaluated when pulmonary embolism is suspected?

Answer: Possibility of amniotic fluid embolism - Diagnosis of exclusion:

- 1st: There is HTN and RVF followed by hypotension and cardiogenic shock
- Later: DIC
- Most of the time, it is postmortem diagnosis - Fetal origin contents can be identified in maternal lungs.

Q7.2: Where does the bleeding typically arise from in cases of genital hematoma?



Answer: Bleeding arises from:

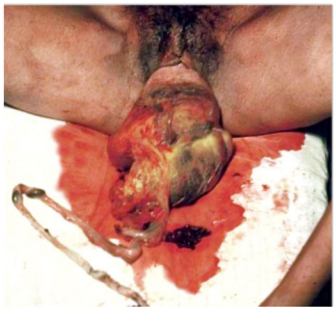
- **Vulval hematomas:** Branches of internal pudendal artery
- **Vaginal hematomas:** Branches of vaginal artery and descending cervical artery.

Q7.3: What is the management of genital hematomas?

Answer: Management:

- Hemodynamically unstable **or** Severely symptomatic **or** >5cm in size **or** Increasing in size
  - o Resuscitation + Drainage in OT
  - o Bleeder ligated
- Stable patients **or** Small hematoma **or** Asymptomatic
  - o Observation

Q7.4: What are the most importan risk factors of uterine inversion?



Answer: Atonic uterus, fundal placenta, morbidly dherent placenta.

Q7.5: What is the initial type of shock in uterine inversion?

Answer: Neurogenic shock (out of proportion tovisible bleeding).

Q7.6: What is the most common cause of death in uterine inversion?

Answer: Hemorrhagic shock

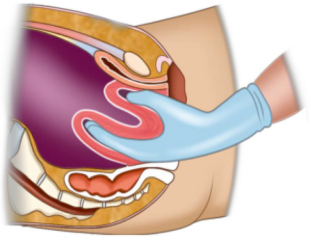
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Q7.7: What are the types of inversion of uterus?

Answer: **Types:**

- **Complete:**
  - Fundus descended below the cervix
- **Incomplete:**
  - Fundus not descended below the cervix

Q7.8: What is the management of Uterine Inversion?



Manual reposition

Answer: **Management:**

- Call for help and immediate resuscitation
- Do not separate placenta if it has not separated on its own
- Stop oxytocin as continuing oxytocin makes the repositioning difficult
- Manual reposition by **Johnson's method**
  - Ideally done in OT under anaesthesia
  - Tocolysis may/may not be needed
  - Antibiotic cover is given.
- After completion of repositioning, oxytocin infusion continued for 12 hours.
- Other methods:
  - **O Sullivan's hydrostatic replacement** method (done vaginally)
  - Abdominal methods (need laparotomy)
    - → Huntington's method
    - → Haultain's method

Q7.9: A multigravida delivers a stillborn baby after laboring for 8 hours at gestational age of 32 weeks. AMTSL was followed, 30 mins later, the placenta has failed to deliver. During attempts with controlled cord traction, the umbilical cord gets avulsed and the patient begins to bleed profusely. Which of the following is the most appropriate next step in patient management?

Answer: Manual removal of placenta

- Diagnosis: **Retained placenta**
  - M/c cause is inefficient uterine contractions

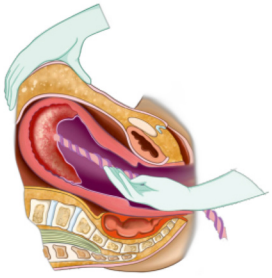
BIG QUESTION 8: What is retained placenta?

Broad Answer: 30 minutes since delivery and placenta not delivered.

- Bleeding occurs if placenta separates in bits and pieces and uterus remains atonic

DETAILED QUESTIONS

Q8.1: What is the management, if the placenta is not delivered within 30 minutes after childbirth?



Manual removal of placenta

Answer: **Management:**

- **No hemorrhage:**
  - Can be observed for further 30 minutes before attempting manual removal of placenta.
- **Bleeding + or Woman already under regional anesthesia:**
  - Proceed with manual removal of placenta.

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Q8.2: What are the possible causes of a retained placenta?

Answer: **Possibilities:**

Trapped Placenta	Placenta Adherens	Morbidly Adherent Placenta
Placenta separated, trapped in lower uterine segment and uterus well contracted. • Signs of placental separation present • Risk of bleeding is less (well contracted uterus).	Myometrium behind the placenta fails to contract so it has not yet separated.	Placenta invading into myometrium. • Results in failure or incomplete separation of placenta after delivery.

Q8.3: How can placenta adherens be differentiated from morbidly adherent placenta during manual removal attempts?

Answer: During manual removal of placenta,

- Plane of cleavage easily found → Placenta adherens.
- Plane of cleavage not found → Morbidly adherent placenta

Q8.4: In what situations can morbidly adherent placenta be encountered?

Answer: Can be seen in:

- Retained placenta
  - o End up doing manual removal of placenta
- Uterine inversion
- C-section
  - o Placenta did not deparate on its own → Manual removal of placenta → Separated in bits and pieces.

Q8.5: What confirms the diagnosis of morbidly adherent placenta?

Answer: HPE from hysterectomy specimen



Morbidly adherent placenta
Placenta perforating myometrium and reaching upto serosa

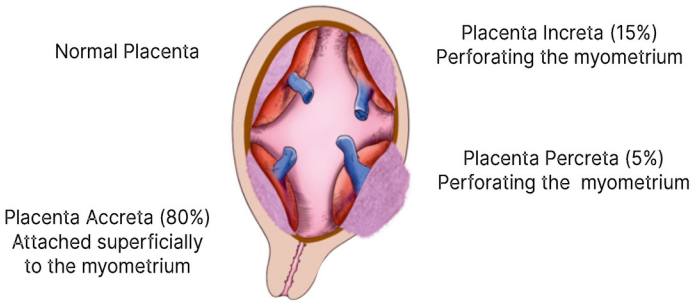


Hysterectomy specimen showing morbidly adherent placenta

BIG QUESTION 9: What are the types of Placenta Accreta Spectrum (PAS)?

Broad Answer: **Types are:**

Placenta Accreta (m/c)	Placenta Increta	Placenta Percreta
Just attached to the myometrium	Gone into the myometrium	Perforates the myometrium completely, can reach up to the serosa, and can also perforate the nearby tissues.



DETAILED QUESTIONS

Q9.1: What is the defect in Placenta Accreta Sprectrum (PAS)?

Answer: Partial or total absence of decidua basalis.

- Defective development of the Nitabuch layer.

Q9.2: What is the most common risk factor for placenta accreta spectrum?

Answer: Previous c-section.

- Risk is directly proportional to the number of cesarean sections.
- Maximum risk: Previous c-section + Placenta previa in current pregnancy.

Q9.3: What is the initial diagnosis of placenta accreta spectrum?

Answer: Antenatal diagnosis → Initial diagnosis → USG Doppler

- USG Doppler:
  - Loss of retroplacental sonolucent zone, thinning of myometrium overlying the placenta, hypervascularity of bladder-serosa interface, placenta lacunae or lakes with turbulent flow.
  - **Moth-eaten/Swiss cheese appearance** of placenta.
- MRI is useful if USG is inconclusive, for operative planning.

Q9.4: What is the management of placenta accreta spectrum?

Answer: **Management:**

- Preferred management with antenatal diagnosis → Planned delivery at tertiary centre between 34-37 weeks (34-35 weeks + 6 days preferred).
- Elective C-section done
- Do not attempt placental removal, proceed with hysterectomy.

Q9.5: A multiparous women with PROM at 32 weeks is admitted in LR. the nurse was examining the woman for contractions and suddenly noticed a prolapsed umbilical cord. She calls you on the phone. What do you ask her to do?

Answer: Put the woman in the Trendelenburg position

- Fetus is in danger due to risk of fetal hypoxia because of vasospasm of the umbilical vessels and cord compression between presenting part and birth canal.
- Put the woman in Trendelenburg position
- Call for help
- Check FHS
- Relieve the cord compression, the next step is decided
- To save the baby → Category 1 C-Section (diagnosis to delivery interval should be < 30 minutes).

- If delivery is imminent → Vaginal delivery otherwise a c-section (category 1)
- Stop oxytocin infusion as more the uterus contracts, more the chances of cord compression between the presenting part and birth canal.

BIG QUESTION 10: What are the risk factors for cord prolapse?

Broad Answer: Risk factors:

- Multiparous
- Preterm
- Ruptured membranes
- PPROM

DETAILED QUESTIONS

Q10.1: What are the methods to relieve cord compression?

Answer: Methods:

- Trendelenburg with pillow under buttocks
- Retrograde filling of bladder (Vago's method)
- Sim's position, Knee-chest position
- Manual relief: Push the presenting part up
  - Cord should never be pushed all the way up in the uterus

Q10.2: How to avoid cord prolapse?

Answer: Ways to avoid:

- Always check FHS and do P/V after rupture of membranes
- Careful P/V with malpresentation
- Avoid ARM with high presenting part & polyhydramnios
- Safe confinement of transverse/oblique lie at term

Q10.3: How is cord presentation identified during labor?

Answer: Cord Presentation in Labor:

- Membranes are intact, but cord lying in front of presenting part
- On P/V: Membranes intact and feels like bag of worms

Q10.4: How to manage cord presentation in labor?

Answer: Perform C-section in these circumstances

BIG QUESTION 11: Unbooked 21-year-old primigravida is seen in emergency at term with labor pains for 2 days and leaking P/V for over 24 hours, h/o dai handling present. She is febrile, PR 110/min, BP is 110/70 mmHg. On P/A exam, uterus term size, feels tense and tender, fetal parts not easily palpable and FHR cannot be localized. On P/V exam, vagina feels hot and dry, cervix feels thick and edematous and 6cm dilated, membranes absent, thick meconium, huge caput reaching +2 station and grade 3 molding. Urine is bloodstained. What is the most likely diagnosis?

Broad Answer: Obstructed labor

DETAILED QUESTIONS

Q11.1: What are features of chorioamnionitis as mentioned in above case?

Answer: Features:

- Leaking history for 24 hours
- Fever
- Tachycardia with normal BP
- Chorioamnionitis can happen in setting of prolonged leaking and obstructed labor also.

Q11.2: How to identify ruptured and unruptured uterus in above case?

Answer: Not ruptured uterus as fetal parts are easily palpable, and in ruptures uterus on P/V, loss of station present

- Signs and symptoms of hypovolemia should be present
- Fetal parts are not easily palpable in obstructed labor
  - Tonically contracted upper segment and dilated lower segment
  - Can palpate Bandl's ring

Q11.3: What is Bandl's ring?

Answer: In obstructed labor, a ring formed at the junction of tonically contracted upper segment and thin, stretched LUS, felt on P/A exam → Bandl's ring (pathological retraction ring).

Q11.4: What is the management of obstructed labor?

Answer: Resuscitation + Emergency cesarean section (even if the baby is dead).

BIG QUESTION 12: Unbooked G4P3L3 with 9 months of gestation in labor, is seen in the emergency in collapsed state. On examination, the fetal parts are superficially palpable. FHS cannot be heard. She is 5cm dilated, and the presenting part cannot be felt on P/V examination. There is bright red vaginal bleeding. What is the most likely diagnosis?

Broad Answer: Rupture Uterus

- Clinical context:
  - Woman in labor with strong uterine contractions → Sudden cessation of uterine contractions → Sudden severe abdominal pain → As fetus expelled to peritoneal cavity.

DETAILED QUESTIONS

Q12.1: What are the possible causes of uterine rupture in an unscarred uterus?

Answer: Rupture with an unscarred uterus can occur with:

- Obstructed labor (lower uterine segment)
- Grand multipara (upper segment rupture)
- Uterine structural malformations

Q12.2: What is the risk of uterine scar rupture after one previous cesarean section (LSCS)?

Answer: Scar rupture: 1 prior LSCS → Risk of scar rupture ~0.5% (1 in 200).

- Risk is increased in :
  - Excessive uterine contractions
  - Induced or augmented labor
  - Intrauterine manipulation

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Q12.3: What are the common uterine incisions?

Answer: They are:

- **Kerr's incision:** Low transverse uterine incision
- **Kronig's incision:** Lower segment vertical incision
- **Sanger's incision:** Classical (upper segment) CS

Q12.4: What is the risk of uterine rupture in a pregnancy following a previous uterine rupture?

Answer: Risk of scar rupture with h/o scar rupture in previous pregnancy:

- Lower segment: Up to 6%
- Upper segment: Up to 32%

BIG QUESTION 13: What are the definitive indications for performing an elective repeat cesarean section (ERCS)?

Broad Answer: **Absolute indications of elective repeat CS** (cannot allow vaginal deliver, VBAC) → Trial of Labor After Cesarean (TOLAC) is contraindicated

- Previous classical or Tor J-shaped uterine incision (high risk of scar rupture = 2.7%)
- Previous 2 LSCS or prior h/o rupture
- C/I to vaginal delivery (placenta previa, inadequate pelvis, transverse lie)
- CPD in current pregnancy
- Non-reassuring fetal status
- The female does not consent to TOLAC
- Risks associated with TOLAC:
  - Risk of rupture
  - Risk of hypoxic-ischemic encephalopathy in newborns if the fetus survives
- 24-hour OT facilities not present

DETAILED QUESTIONS

Q13.1: When is an elective cesarean section scheduled for women with a previous C-section?

Answer: At 39 completed weeks

- Not before this as there is risk of Transient Tachypneoa of Newborn (TTNB).

Q13.2: What is the success rate of TOLAC?

Answer: Average success rate: 70-75%.

Q13.3: Which factor most significantly increases the likelihood of a successful TOLAC?

Answer: H/o prior vaginal delivery at term and in spontaneous labor

Q13.4: Which factors decrease the success rate of TOLAC?

Answer: Factors are (conditions where cesarean section is preferable - TOLAC can be done):

- > 40 weeks
- Induced labor
- Macrosomia
- Multiple pregnancy
- Breech

- Preeclampsia
- Short inter-delivery interval
  - Ideal inter-delivery interval: 18 months
  - Minimum time to conception from prior CS (interpregnancy interval): 6 months

Q13.5: A woman with prior c-section is in active labor at term, with good uterine contractions. Her CTG trace is showing a baseline FHR of 120 beats/min with persistent late decelerations. Her PR is 114/min. On P/A, the uterine contour is maintained and thre is no scar tenderness. Meconium-stained liquor is noted on the perineal pad. What is the most likely diagnosis?

Answer: Impending rupture

- Points in favor of **Impending Rupture:**
  - Previous cesarean section
  - Abnormal CTG changes
- Most consistent sign of early rupture or impending rupture → **Non-reassuring FHR on CTG**.
  - Initially fetal tachycardia → Variable decelerations → Late decelerations → Bradycardia.

BIG QUESTION 14: How is preterm labor diagnosed?

Broad Answer: Diagnosis of preterm labor:

- Regular uterine contraction with change in cervical dilatation, effacement, or both. **OR**
- Regular contractions and cervical dilatation of atleast 2cm at initial presentation.
- **WHO (2022)**
  - ≥6 regular contractions in 1 hour + Cervical dilatation of ≥ 3cm and/or effacement ≥75%
  - If above feature present, very high likelihood that woman will deliver in next 7 days.

DETAILED QUESTIONS

Q14.1: A 19-year-old primigravida at 30 weeks gestation is seen in the emergency department with complaints of pain in the abdomen. There are no medical risk factors, no fever, vitals are normal. P/A examination: SFH is 30cm, cephalic presentation, mild contractions present. On P/V examination, cervix is 2cm dilated. 80% effaced, BOM felt. What is the management?

Answer: Give steroids and tocolysis

- **Diagnosis:** Established preterm labor
- Cervical ceclage done in the context of recurrent pregnancy loss, prior obstetric history.

Q14.2: What are the tests to diagnose preterm labor?

Answer: Tests that can help diagnose (case of no cervical changes):

- TVS: Cervical length checked; if <20 mm → high likelihood of delivering in the next 7 days.
- Fetal fibronectin + (cervical length: 20-30mm)
  - Fetal fibronectin is checked in cervico-vaginal secretions between 23-34 weeks → Considered + if >50 ng/ml.

Q14.3: When is it appropriate to allow preterm labor to progress?

Answer: Conditions:

- Active labor
- POG ≥ 34 weeks
- Fetal status non-reassuring

- IUD, lethal fetal anatomy
- Placental abruption
- PPROM already in labor
- Chorioamnionitis
- Preeclampsia/eclapmsia

Q14.4: What interventions are used to reduce perinatal morbidity in preterm labor?

Answer: Interventions to decrease perinatal morbidity in preterm labor:

- Antenatal corticosteroids (<34 weeks with established preterm labor or planned preterm birth).
- DOC: Dexamethasone
- Takes 24 hours to complete the course of steroids
- In a laboring woman needing steroids, a single dose should be given even if the full course cannot be completed.

Drug	Dose
Dexamethasone	6mg IM x 12 hourly (4 doses)
Betamethasone	12mg IM x 24 hours (2 doses)

- Chorioamnionitis → Steroids contraindicated
- Tocolysis: Buy time (for steroids or arrange higher centre referral)
  - DOC: Nifedipine

Q14.5: Which other drugs have tocolytic properties?

Answer: Drugs:

- Indomethacin (NSAID)
  - S/E: Oligohydramnios
  - If used >32 weeks: Premature closure of ductus arteriosus
- Atosiban is oxytocin receptor antagonist, can be used in maternal heart disease.
- Magnesium Sulfate ($MgSO_4$) → Usually not used
  - At dosage having tocolytic action, toxicity is also present
  - Neuroprotection of fetus (decrease risk of cerebral palsy) in extreme preterm labor with imminent delivery
- Beta-adrenergic agonists like Ritodrine, Isoxsuprine and Terbutaline not preferred
  - S/E: Tachycardia, tremor, hyperglycemia, pulmonary edema.

BIG QUESTION 15: Although not included in routine screening, in what situations is predicting and preventing preterm birth beneficial?

Broad Answer: High risk woman: Those with h/o prior spontaneous preterm birth or 2nd trimester recurrent pregnancy losses.

- Most important risk factor: **H/o prior preterm birth.**
- Prediction and prevention of preterm birth is applicable ony in woman currently carrying singleton pregnancy and controversial in woman carrying multiple pregnancy.

DETAILED QUESTIONS

Q15.1: How is the risk of preterm birth assessed using transvaginal ultrasound (TVS)?

Answer: Cervical length assessment done between 16-24 weeks

- < 25mm: Predictive of increased risk of preterm birth

Q15.2: What is the drug of choice for the prevention of preterm birth?

Answer: Pogesterone

H/o preterm birth and short cervical length	Cerclage/vaginal micronized progesterone
No h/o spontaneous preterm birth and incidental diagnosis of short cervix	No cerclage Vaginal progesterone preferable
H/o spontaneous birth and normal cervical length	No cerclage Vaginal progesterone not preferable (tend to give 17-OH progesterone caproate but evidence suggest it to be controversial).

Q15.3: A primigravida complains of leaking fluid from the vagina at 32 weeks gestation. There is no complain of pain abdomen or vaginal bleeding. Her PR is 88/min, BP is 110/70 mmHg, afebrile. The uterus is relaxed and FH corresponds to 32-week size, cephalic presentation. FHS is 140 beats/min. What is the next step?

Answer: Perform a sterile per-speculum exam

- Start with P/S examination → P/V examination
- On P/V examination: For cervical findings
- Avoid unnecessary P/V examination in ruptured membranes (avoid infections)
- PS examination: If liquor is seen coming out of the os → Diagnosis of ruptured membranes → Leaking P/V confirmed.
- Secretions from vagina - Not sure regarding nature of secretion
  - Test for amniotic fluid proteins
  - USG for amniotic Fluid Index → If less → Suggests leaking but can be less due to other causes also.
- Admit and observe the patient, a sterile pad is given.

Q15.4: What are the tests for the identification of amniotic fluid?

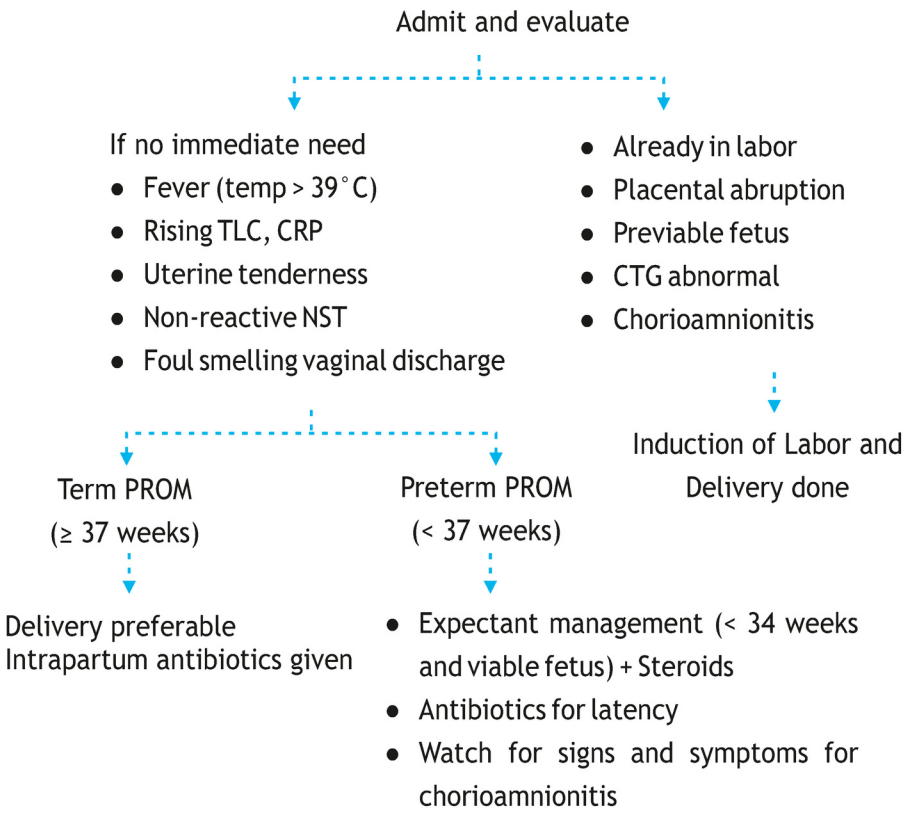
Answer: Tests for identification of Amniotic Fluid (done on a pool of secretions of vagina):

- **Litmus test:** Nitrazine paper turns blue
  - False positive results with other alkaline secretions like blood, semen, meconium, in bacterial vaginosis and trichomoniasis.
- **Microscopy: Fern**ing pattern on glass slides under microscope.
  - Due to sodium chloride content of amniotic fluid
- **Newer tests**
  - Placental alpha macroglobulin 1
  - IGFBP-1
  - IGFBP-1 + AFP

BIG QUESTION 16: What is the clinical approach to managing prelabor rupture of membranes (PROM)?

Broad Answer: Approach:

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- 34-37 weeks: Delivery or expectant management (decided on case to case basis)

DETAILED QUESTIONS

Q16.1: What are the antibiotics for latency?

Answer: Ampicillin and Azithromycin

- Augmentin is not given (increased risk of necrotizing enterolcolitis in fetus).

Q16.2: A 27-year-old primigravida, at 28 weeks, has not been feeling fetal movements for the past 2 days. There is no h/o leaking or bleeding P/V or abdominal pain. She has no other medical problems and her pregnancy has been uncomplicated so far. Her blood group is O negative and her recent Hb is 12 g/dl. Fundal height is 24cm. FHR is not heard by handheld Doppler. What is the next step?

Answer: Transabdominal USG

- Differential diagnosis:
  - Wrong dates
  - Oligohydramnios
  - Leaking P/V
  - Fetal growth restriction
  - Intrauterine fetal death (absence of cardiac activity on USG)

BIG QUESTION 17: What are the types of Intrauterine Fetal Death (IUFD)?

Broad Answer: Intrauterine Fetal Death (IUFD)

- **Early fetal death**
  - 20-28 weeks (atleast weighing 500gm)

- **Late fetal death**
  - Beyond 28 weeks (atleast weighing 1000gm)

DETAILED QUESTIONS

Q17.1: What is the method for diagnosing intrauterine fetal death (IUFD)?

Answer: Ultrasound

- Radiological signs of IUD:
  - **Robert's sign:** Appearance of gas shadow in the chambers of the heart.
  - **Ball sign:** Hyperflexion of the spine
  - **Spalding sign:** Overlapping of skull bones (usually appears 7 days after IUD).



Spalding Sign

Q17.2: What is the risk of developing DIC in cases of intrauterine fetal death (IUFD)?

Answer: Risk of DIC in:

- First 4 weeks: 10%
- Thereafter: 30%

Q17.3: What maternal complications necessitate immediate delivery in the context of IUFD?

Answer: Maternal complications:

- Infection and sepsis
- Preeclampsia
- Abruption
- Ruptured membranes
- Any obstetric condition requiring urgent delivery for the mother's health

Q17.4: What is the mode of delivery in IUFD?

Answer: Mode of delivery is vaginal (IOL) and C-section for obstetric indication.

Q17.5: When should delivery be scheduled in a woman with a previous unexplained stillbirth, assuming no current medical or obstetric issues?

Answer: At completed 39 weeks

12. HIGH-RISK OBSTETRICS

BIG QUESTION 1: What types of hypertensive disorders can occur during pregnancy?

Broad Answer: Hypertensive disorders in pregnancy:

- Gestational HTN
- Pre-eclampsia
- Chronic HTN
- Chronic HTN with superimposed Pre-eclampsia

DETAILED QUESTIONS

Q1.1: How is hypertension defined during pregnancy?

Answer: BP **≥140/90 mmHg** on at least **2 occasions**, at least **4 hours apart**.

Q1.2: What is Gestational HTN?

Answer:

- High BP beyond 20 weeks of gestation
- No proteinuria
- No end-organ changes
- BP becomes normal within 12 weeks postpartum

Q1.3: What condition is referred to as pre-eclampsia in pregnancy?

Answer:

- High BP beyond 20 weeks of gestation
- Proteinuria and/or any end-organ changes
- BP becomes normal within 12 weeks postpartum
- **Proteinuria:**
  - Dipstick: ≥1+
  - Urine protein: Creatinine ≥0.3mg/dL
  - 24-hour urine protein: ≥300mg

Q1.4: What is chronic hypertension in pregnancy?

Answer:

- Pre-pregnancy HTN, **OR**
- HTN before 20 weeks of gestation, **OR**
- BP not normal even after 12 weeks postpartum

Q1.5: What is meant by chronic hypertension with superimposed pre-eclampsia?

Answer:

- If worsening HTH, **OR**
- New-onset or worsening proteinuria, **AND/OR**
- End-organ changes beyond 20 weeks of gestation

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BIG QUESTION 2: How does pre-eclampsia develop at the pathological level?

Broad Answer:

- Pathology begins in the placenta (chorionic villi).
- Centerpiece of pathology is endothelial damage.
- Imbalance between angiogenic and anti-angiogenic factors
  - o Mainly responsible for early-onset pre-eclampsia (< 34 weeks of gestation).

DETAILED QUESTIONS

Q2.1: How does smoking affect the risk of preeclampsia?

Answer: Smoking decreases the risk of pre-eclampsia.

Q2.2: What are the molecular changes in pre-eclampsia?

Answer:

Increased Factors	Decreased Factors
• sFlt-1 (Soluble Fms-like Tyrosine Kinase-1) ↑ • sEng (Soluble Endoglin) ↑ • TXA_2 (Thromboxane A2) ↑	• VEGF (Vascular Endothelial Growth Factor) ↓ • PIGF (Placental Growth Factor) ↓ • NO (Nitric Oxide) ↓ • PGI_2 (Prostacyclin) ↓

Q2.3: How does preeclampsia affect hematocrit levels?

Answer: Increased hemoconcentration

Q2.4: What are the common clinical signs observed in patients with preeclampsia?

Answer: Peripheral vasoconstriction, tissue edema, ischemic and thrombotic sequalae are present.

Q2.5: What is FIGO screening for preeclampsia based on?

Answer: FIGO screening (11-13 weeks) is based on:

- High-risk history
- Mean arterial BP
- Uterine artery pulsatility index
- Serum PIGF and PAPP-A (low).

Q2.6: What drug is used for the prophylaxis of preeclampsia?

Answer: Low-dose Aspirin

- Start early in pregnancy (12 weeks)
- Till 36 weeks of gestation

Q2.7: What does the persistence of uterine artery Doppler notching beyond 22-24 weeks indicate?

Answer: Fetal Growth Restriction and Pre-Eclampsia.

Q2.8: Do antioxidants, salt restriction, or fluid restriction help in managing preeclampsia?

Answer: No, these interventions have no proven benefit in preeclampsia management.

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Q2.9: When are calcium supplements recommended in preeclampsia?

Answer: Only if there is a documented calcium deficiency.

Q2.10: What is severe pre-eclampsia?

Answer: Severe Pre-Eclampsia:

- If any of the following is present:
  - BP persistently: ≥160/100 mmHg
  - Platelet count <1 lac/mm^3
  - Serum Creatinine: >1.1 mg/dL
  - AST and ALT: More than twice upper limit of normal
  - Headache, blurring of vision, epigastric pain
  - Pulmonary edema
- Degree of proteinuria does not define severity

BIG QUESTION 3: How is HELLP syndrome defined according to the Tennessee criteria?

Broad Answer:

- **Tennessee Criteria:**
  - **H - H**emolysis:
    - → Elevated unconjugated bilirubin
    - → Peripheral smear schistocytes
    - → LDH
    - → Low haptoglobin
  - **EL - E**levated **L**iver enzymes
  - **LP - L**ow **P**latelets
- **Interpretation:**
  - **Complete HELLP:** If all 3 present
  - **Partial HELLP:** If 1 or 2 present

DETAILED QUESTIONS

Q3.1: Who coined the term "HELLP Syndrome"?

Answer: Weinstein

Q3.2: What is the recurrence rate of HELLP syndrome?

Answer: 4-7%

Q3.3: Is blood pressure always elevated in HELLP syndrome?

Answer: BP can be normal in 10-15% of cases of HELLP syndrome.

Q3.4: What are the signs of renal involvement in HELLP syndrome?

Answer:

- Glomerular endotheliosis
- Decreased renal perfusion & GFR
- Oliguria
- Raised serum uric acid

Q3.5: What are the signs of liver involvement in HELLP syndrome?

Answer:

- Periportal hemorrhages
- Stretching of liver capsule- RUQ pain (danger sign)
- Risk of hepatic hematoma and rupture

BIG QUESTION 4: What does the term eclampsia refer to?

Broad Answer: Pre-eclampsia + Convulsions (GTCS)

- Cerebral hyperperfusion and vasogenic edema are present.
- Antepartum eclampsia is most dangerous.

DETAILED QUESTIONS

Q4.1: What is the most common cause of sudden death in eclampsia?

Answer: Intracerebral hemorrhage (stroke) → Due to acute hypertenive complication.

- Always rule out hemorrhage if hypotension is present in cases of pre-eclampsia or eclampsia.

Q4.2: What are the immediate management priorities in a patient with eclampsia?

Answer:

- Maintaining the airway
- Preventing injury & further convulsions

Q4.3: What is the drug of choice in eclampsia?

Answer: Magnesium Sulfate ($MgSO_4$)

- Eclampsia with Coma and Cerebral Edema: Add Mannitol

Q4.4: What is the definitive management of eclampsia?

Answer: Delivery (preferably vaginal)

- Cesarean section for obstetric indications
- Control of HTN is also required to prevetn acute hypertensive complications.

Q4.5: Which form of blindness occurs most frequently in eclamptic patients?

Answer: Occipital blindness due to edema in occipital lobe → Amaurosis.

- Blindness is seen in 15% of cases.

Q4.6: Is blood pressure always elevated in eclampsia?

Answer: BP can be normal in 15% of cases.

Q4.7: What is impending eclampsia?

Answer:

- Headache (M/c) and blurring of vision (2nd M/c)
- Epigastric/RUQ pain
- Brisk tendon reflexes (clonus)
- Altered mentation

BIG QUESTION 5: What are the drugs of choice and precautions for managing hypertension in pregnancy?

Broad Answer: The main drug of choice (DOC) for hypertension in pregnancy is **Labetalol**. In acute hypertensive crises, intravenous labetalol is used. Other first-line options include oral nifedipine. Antihypertensives are started when **BP is persistently >150/100 mmHg**, but care must be taken to avoid hypotension, which can cause placental hypoperfusion. Some drugs (ACE inhibitors, ARBs, and certain beta-blockers) are contraindicated due to teratogenicity. **Diuretics** are used only for pulmonary edema.

DETAILED QUESTIONS

Q5.1:What is the drug of choice for hypertension in pregnancy?

Answer: **Labetalol** is the DOC for control of hypertension in pregnancy.

Q5.2: What is the management for acute hypertensive crisis (>160/100 mmHg) in pregnancy?

Answer:

- **IV Labetalol** (maximum 220 mg) in incremental doses: 20, 40, 80, 80 mg
- BP should be checked every 15 minutes

Q5.3: What are the other first-line antihypertensive options in pregnancy?

Answer:

- **Nifedipine (oral)** is also a first-line treatment
- **Never given sublingually** → risk of sudden hypotension

Q5.4: When should antihypertensive treatment be initiated in pregnancy?

Answer: If BP is persistently **>150/100 mmHg**

Q5.5: What are the contraindications of labetalol?

Answer:

- Asthma
- Bradycardia
- Decompensated cardiac status

Q5.6: Which antihypertensive drugs are contraindicated in pregnancy and why?

Answer:

- **ACE inhibitors and ARBs** → cause oliguria and are teratogenic
- Other beta blockers may also be contraindicated

Q5.7: What is the role of diuretics in pregnancy-related hypertension?

Answer:

- Used only for treatment of **pulmonary edema**
- Can be used to control BP after delivery
- During pregnancy, may cause placental hypoperfusion

BIG QUESTION 6: What is the role of magnesium sulfate?

Broad Answer:

- Neuroprotection
- Centrally acting anti-convulsant

DETAILED QUESTIONS

Q6.1: What is Pritchard Regime?

Answer: **Pritchard Regime:**

- Loading dose 4g IV & 10g IM, given irrespective of renal function.
- Maintenance dose 5g IM on alternate buttock, every 4 hours for 24 hours from last seizure or delivery, whichever is later.

Q6.2: What is the therapeutic range of serum magnesium levels?

Answer: 4-7 mEq/L

Q6.3: What is the earliest clinical sign of magnesium toxicity?

Answer: Loss of knee jerk (10 mEq/L).

- Followed by respiratory depression & cardiac arrest.

Q6.4: What is the antidote for mangensium toxicity?

Answer: Calcium gluconate

Q6.5: Under what conditions should magnesium sulfate administration be omitted?

Answer: Omit dose of $MgSO_4$, if:

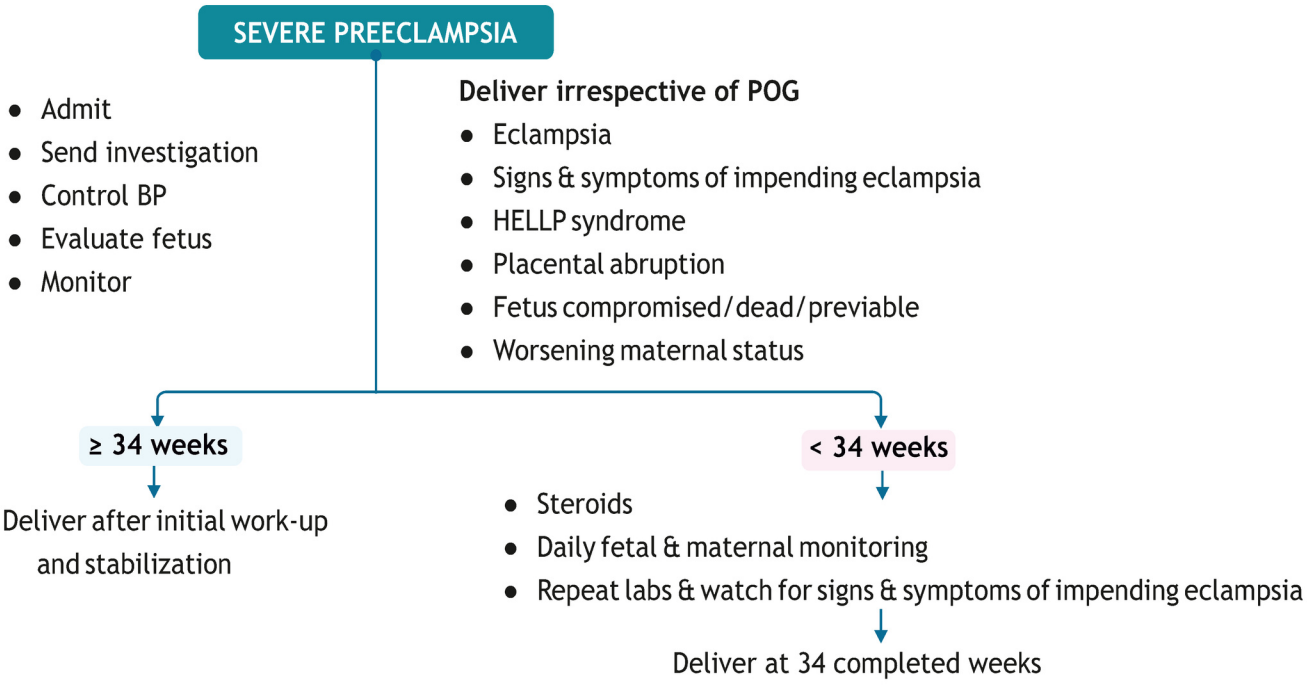
- Deep tendon reflex is absent
- RR <16/min
- Urine output <100 ml/4hour (<30 ml/hr).
- If urine output is low: Check serum creatinine levels
  - Further dosing has to be guided by serum magnesium levels.

Q6.6: What is the management of mild pre-eclampsia?

Answer: BP well controlled, Baby and mother are well → Deliver at 37 completed weeks.

Q6.7: What is the clinical management of severe pre-eclampsia?

Answer:



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Q6.8: In which conditions is prophylactic magnesium sulfate administered?

Answer:

- Severe Pre-Eclampsia
- HELLP Syndrome
- Impending Eclampsia

BIG QUESTION 7: What is the Delphi consensus regarding fetal growth restriction (FGR)?

Broad Answer: It is used to diagnose FGR in the absence of any congenital abnormality:

Early FGR (<32 weeks)	• AC/EFW <3rd centile or absent end-diastolic flow in the umbilical artery. • AC/EFW <10th centile + Uterine artery pulsatility index >95th centile and/or umbilical artery pulsatility index >95th centile (decreasing diastolic flow).
Late FGR (≥32 weeks)	• AC/EFW <3rd centile • At least 2/3rd: o AC/EFW <10th centile o AC/EFW crossing >2 quartiles on growth centiles o CPR <5th centile or Umbilical artery pulsatility index >95th centile.

DETAILED QUESTIONS

Q7.1: A 25-year-old primigravida came at 32 weeks gestation. She is sure of her dates. Her fundal height corresponds to 28 weeks. BP is normal. USG shows the following parameters: BPD: 31 weeks, HC: 30 weeks, FL 32 weeks, AC: 28 weeks, AFI decreased, EFW 1000gm. What is the likely diagnosis?

BPD - Biparietal Diameter
HC - Head Circumference
FL - Femur Length
AC - Abdominal Circumference
AFI - Amniotic Fluid Index
EFW - Estimated Fetal Weight

A. Small for gestational age
B. Fetal growth restriction
C. Constitutionally small fetus
D. Wrong dates

Answer: B. Fetal growth restriction

- Abdominal circumference is the most important parameter for fetal growth
- Decreased AC and AFI → Chronic uteroplacental insufficiency
- Fetal growth restriction → Rate of growth slowed, and uteroplacental insufficiency
  - o USG doppler is done to find evidence of uteroplacental insufficiency and track growth every 3 weeks.
  - o Small for gestational age → EFW/AC <10th percentile for that gestational age
  - o In constitutionally small fetus, the rate of growth over time is normal
    → No evidence of uteroplacental insufficiency

Q7.2: Which investigation is the gold standard for evaluation of growth-restricted fetus?

Answer: **Umbilical Artery Doppler**

- 1st changes are seen
- Used for timing of delivery
- Determines obstetric outcome

Q7.3: How does uteroplacental insufficiency affect the umbilical artery S/D (systolic/diastolic) ratio?

Answer: S/D ratio Increase (diastolic flow decrease)

- Normally, Umbilical artery S/D ratio decreases as pregnancy progresses

Q7.4: In which gestational ages and umbilical artery Doppler findings should steroids be given and delivery planned?

Answer:

- Umbilical artery → Absent end-diastolic flow & POG ≥ 34 weeks
- Umbilical artery → Reduced end-diastolic flow & POG ≥ 30-32 weeks

Q7.5: Which Doppler findings indicate a preterminal fetal state?

Answer:

- Reversal of flow in Ductus venosus
- Umbilical venous pulsations

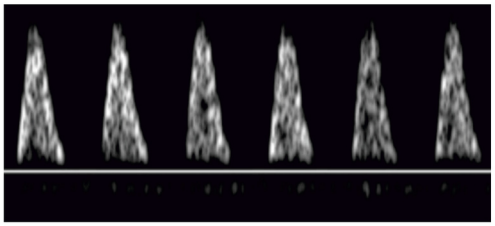
Q7.6: What is the aim of continuing pregnancy in fetal growth restriction (FGR)?

Answer: At least till 37-38 weeks.

- If EFW < 3rd centile or if oligohydramnios → Prefer delivery by 37 weeks.

Q7.7: A woman with mild preeclampsia is being monitored for fetal growth regularly from 28 weeks onwards, when IUGR was first detected. During her follow-up at 32 weeks, the umbilical artery doppler showed the following findings. What is thenext step?

A. Repeat Doppler after 1 week
B. Termination of pregnancy
C. Monitor with biophysical profile
D. Admit, steroid administration & monitor with BPP



Answer: D. Admit, steroid administration & monitor with BPP

- Umbilical artery Doppler: Absent End Diastolic Flow

Q7.8: A 24-year-old woman is seen at 32 weeks with jaundice accompanied by nause and vomiting & RUQ pain. Her PR is 90/min, BP is 150/100 mmHg. Urine albumin is negative by dipstick. Her labs show Hb 8 g/dl, platelet count 80,000/mm³ & peripheral smear showing schistocytes, serum bilirubin levels 2 g/dl, AST 75 IU/L. What is the likely diagnosis?

A. Obstetric cholestasis
B. Acute hepatitis
C. HELLP syndrome
D. Acute fatty liver of pregnancy

Answer: C. HELLP syndrome

- M/c clinical symptom of HELLP syndrome → **RUQ pain**
- Acute hepatitis:
  - Can be present in any trimester
  - Prodromal symptoms +
  - Elevated liver enzymes
  - Serum bilirubin >10 g/dL
  - Hepatomegaly

BIG QUESTION 8: What is acute fatty liver of pregnancy?

Broad Answer: Accumulation of microvesicular fat.

- Aka: Acute yellow atrophy
- It is similar to HELLP syndrome

DETAILED QUESTIONS

Q8.1: What are the clinical manifestations of liver failure in acute fatty liver of pregnancy?

Answer:

- Signs and symptoms of liver failure +
  - Encephalopathy
  - Hypoglycemia
  - Coagulopathy
- Shrunken liver

Q8.2: What is pathology of acute fatty liver of pregancy?

Answer: Linked to mitochondrial abnormalities of fatty acid oxidation

- Recurrence is very rare.

Q8.3: Which diseases can be associated with acute fatty liver of pregnancy?

Answer:

- Acute pancreatitis
- Transient diabetes insipidus

Q8.4: What is the management of acute fatty liver of pregnancy?

Answer: Supportive and delivery.

BIG QUESTION 9: What is the management of hepatitis in pregnancy?

Broad Answer: Conservative management

DETAILED QUESTIONS

Q9.1: Is hepatitis E capable of causing a fulminant course?

Answer: Yes, Hepatitis E can be fulminant → Very high risk of maternal mortality.

Q9.2: What is the most common presentation of hepatitis B?

Answer: Often asymptomatic.

Q9.3: How is hepatitis B diagnosed in pregnancy?

Answer: On routine screening

Q9.4: What factors influence the risk of vertical transmission in hepatitis B?

Answer:

- HBeAg positivity
- HBV DNA viral load

Q9.5: What steps are taken to prevent hepatitis B transmission to a newborn?

Answer: Newborn is given Hep B vaccine and IVIG after delivery

- Vaginal delivery and breastfeeding is allowed.

Q9.6: What drug is used in pregnancy to lower the risk of vertical transmission of hepatitis B in women with high viral loads?

Answer: Antiviral treatment (Tenofovir)

BIG QUESTION 10: What is intrahepatic cholestasis of pregnancy?

Broad Answer: Estrogen-dependent condition

DETAILED QUESTIONS

Q10.1: Which mutations are responsible for intrahepatic cholestasis of pregnancy?

Answer:

- ABCB4 gene encoding MDR-3 protein
- ABCB11 gene encoding Bile Salt Exporter Protein

Q10.2: What are the clinical manifestations of intrahepatic cholestasis of pregnancy?

Answer:

- Usually presents in the 3rd trimester of pregnancy
- Generalized pruritis (predominant complain)
  - Palms and soles are also involved
- No inflammation or liver necrosis
  - Resolves after delivery, but high risk of recurrence

Q10.3: What are the liver profile changes in intrahepatic cholestasis of pregnancy?

Answer:

- Mild jaundice (present in 10% of cases)
  - Levels rarely exceed 5g/dL
- Increased AST
- ALT levels (usually < 200 IU/L)
- Raised serum bile acid levels **(Diagnosis)**

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Q10.4: What is the drug of choice in the management of intrahepatic cholestasis of pregnancy?

Answer: UDCA (ursodeoxycholic acid) + Symptomatic treatment.

- Induction of Labor is preferred between 37-38 weeks

Q10.5: What are the risks associated with intrahepatic cholestasis of pregnancy?

Answer: Increased risk of:

- Preterm birth
- Fetal distress
- Sudden stillbirth (risk is directly proportional to bile acid levels)
- MSL

BIG QUESTION 11: What is the difference between gestational and overt diabetes?

Broad Answer:

Gestational Diabetes	Overt Diabetes
• Diabetes 1st identified during pregnancy • Most likely occur after 24 weeks • Blood sugar levels return to normal usually within 6 weeks postpartum	• Pre-pregnancy diabetes • Abnormal blood sugar levels in the peri-conceptional period • Not normalized even after 6 weeks postpartum

DETAILED QUESTIONS

Q11.1: What is the most sensitive indicator for overt diabetes mellitus?

Answer: HbA1c

- Ideally HbA1c before planning pregnancy is <6.5%.

Q11.2: Are congenital anomalies more common in gestational diabetes or overt diabetes?

Answer: Risk of congenital diabetes is more in overt DM.

Q11.3: What is the most common anomaly?

Answer: CVS > NTDs

Q11.4: What is the most common CVS anomaly?

Answer: VSD

Q11.5: What is the most specific CVS anomaly?

Answer: Transposition of great vessels



Caudal regression syndrome

Q11.6: What is the overall most specific anomaly?

Answer: Sacral agenesis (caudal regression syndrome)

Q11.7: What is the Pederson's hypothesis?

Answer: Maternal hyperglycemia → Fetal hyperglycemia → Fetal hyperinsulinemia → Beta cell hyperplasia of fetal pancreas.

- Fetal growth is dependent on Insulin and IGF-1
- Maternal insulin does not cross placenta
- Fetus is capable of synthesizing its own insulin from 12 weeks onwards
- Large for gestational age EFW > 90th centile

Q11.8: What are the risk factors for macrosomia?

Answer: Macrosomia (>4kg) risk factors:

- Advanced maternal age
- Multiparity
- Obesity
- Excessive weight gain during pregnancy
- Post-term pregnancy



Macrosomia (birth weight >4 kg)

Q11.9: Identify the deformity in the image shown below.



Answer: Sirenomelia (mermaid deformity)

Q11.10: What are the other complications of diabetes in pregnancy?

Answer:

- Abortion (mostly with overt DM)
- Unexplained stillbirth
- Increased risk of pre-eclampsia
- Polyhydramnios
- Preterm labor & PROM
- Shoulder dystocia
- Increased risk of operative delivery and PPH
- Increased risk of infection
- Fetal growth restriction and Oligohydramnios can occur if diabetic vasculopathy is present.

Q11.11: What are the neonatal complications of diabetes in pregnancy?

Answer:

- Hypoglycemia (due to beta-cell hyperplasia of the pancreas)
- Polycythemia
- Hyperbilirubinemia
- RDS
- Hypocalcemia
- Hypomagnesemia
- Hypertrophic cardiomyopathy
- Renal vein thrombosis

Q11.13: What are the recommendations outlined in the Diabetes in Pregnancy Study Group India (DIPSI) guidelines?

Answer:

- Screening is universal by 75gm OGTT, irrespective of fasting
- Done in 1st antenatal visit, then again at 24 weeks

Q11.14: What is the diagnostic criterion for gestational diabetes mellitus based on 2-hour post-glucose blood sugar levels?

Answer: ≥140 mg/dL → Indicates GDM

Q11.15: What are the diagnostic criteria for gestational diabetes mellitus according to the International Association of the Diabetes and Pregnancy Study Groups (IADPSG)?

Answer: 75gm OGTT → One step screening

- If anyone of the following is abnormal → Diagnosis of GDM
  - Fasting ≥92 mg/dL
  - 1 hr ≥180 mg/dL
  - 2 hr ≥153 mg/dL

Q11.16: What are the diagnostic criteria for overt diabetes mellitus during pregnancy?

Answer:

- Fasting ≥126 mg/dL **OR**
- 2 hr ≥200 mg/dL **OR**
- Random ≥200 mg/dL + Symptoms **OR**
- HbA1c >6.5%

BIG QUESTION 12: What are the recommended blood glucose targets for managing diabetes during pregnancy?

Broad Answer: Target levels:

- FBS <95 mg/dL
- 1 hr post-meal <140 mg/dL
- 2 hr post-meal <120 mg/dL

DETAILED QUESTIONS

Q12.1: What is the drug of choice for diabetes in pregnancy?

Answer: Insulin (admit and start)

- Self-monitoring of glucose with a glucometer is taught
- Insulin requirement during pregnancy will increase

Q12.2: What are the initial steps in managing diabetes-level blood sugars during pregnancy?

Answer: Blood sugars:

- GDM range: Diet + Exercise
- Overt DM range: Diet + Exercise + Insulin

Q12.3: Why are oral hypoglycemic agents contraindicated during pregnancy?

Answer: They cause fetal hypoglycemia

- Metformin and Glyburide are considered safe, but used only in GDM.

Q12.4: Which investigations are recommended for diabetic mothers during pregnancy?

Answer:

- Fetal echo (22-24 weeks) is done in case of pre-gestational DM
- Fetal growth scan, especially in 3rd trimester
- Weekly NST/BPP from 32 weeks onwards
- Fetal doppler is only done if FGR is present (not routine)

Q12.5: When should labor be induced in pregnant women with diabetes?

Answer: At 39 completed weeks (well-controlled sugars, no vascular disease, and reassuring fetal status)

- C-Section: EFW >4.5 kg

Q12.6: How should a diabetic mother be prepared prior to IOL or planned C-section?

Answer: Day before IOL or scheduled C-section:

- Night dose of insulin given
- Morning dose is omitted
- Check FBS and serum electrolyte levels
- Start NS @ 100ml/min

Q12.7: How is labor monitored and managed in diabetic pregnancies?

Answer: During labor:

- Blood sugar monitoring every 1-2 hourly
- Urine ketone and sugar every 4 hourly
- Target blood sugar: 70-110 mg/dL
- Ideally, titrate with regular insulin by IV infusion
  - Dose: 1-1.5 units/hr
- Insulin requirement decreases during labor & postpartum

BIG QUESTION 13: What are the most commonly seen twin types in pregnancy?

Broad Answer: Dizygotic > Monozygotic

- Dizygotic twins are always dichromatic diamniotic twins

DETAILED QUESTIONS

Q13.1: What factors influence the incidence of twin pregnancies?

Answer:

- **The incidence of Dizygotic twins varies with:**
  - Ethnicity & race
  - Increased maternal age and parity
  - Tall and heavier women
  - Family history
  - Ovulation induction and ART procedures
- **The incidence of Monozygotic twins** is constant worldwide (1 in 250).

Q13.2: How is zygosity determined?

Answer: By fertilization

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Q13.3: What does chorionicity refer to?

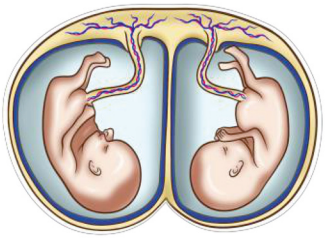
Answer: Placentation

Q13.4: How are monozygotic twins classified based on the timing of embryo division?

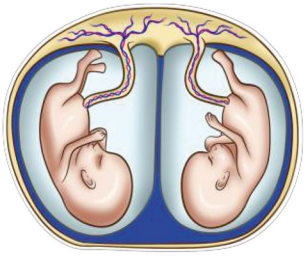
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Answer:

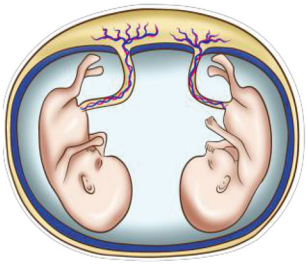
Type of Monozygotic Twin	Time of division
Dichorionic diamniotic	Within 3 days of fertilization
Monochorionic diamniotic	Between 4-8 days of fertilization
Monochorionic monoamniotic	Between 8-12 days of fertilization
Conjoint (Siamese)	Beyond 13 days



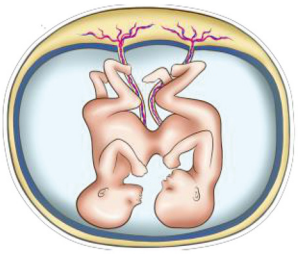
Dichorionic diamniotic



Monochorionic diamniotic



Monochorionic monoamniotic



Conjoint (Siamese)

Q13.5: Which is the most common type of monozygotic twin?

Answer: Thoracopagus

Q13.6: What is superfetation?

Answer: Fertilization of two different eggs in two separate menstrual cycle.

Q13.7: What is superfecundation?

Answer: Fertilization of two separate ova in the same menstrual cycle by different acts of coitus.

- Could be same/different (heteroparental) partner.

Q13.8: What are the complications of twin pregnancy?

Answer:

- Prematurity (m/c fetal complication)
- Fetal complications (m/c in monochorionic/monozygotic)
  - Abortion & congenital malformations
  - Low birth weight & FGR
  - Discordant growth
- Cumulative risk of aneuploidy is more in dizygotic
- **Discordant growth:**
  - $\frac{\text{Weight of larger twin - Weight of smaller twin}}{\text{Weight of larger twin}}$
  - Larger twin is the index
  - If >20% → Discordant growth

- Complications specific to Monochorionic twins
  - Twin to twin transfusion syndromes (TTTS)
    → More likely in MCDA than MCMA type because of the presence of deep arteriovenous anastomosis
  - Twin anemia polycythemia sequence (TAPS)
  - Twin reversed arterial perfusion (TRAP)/Acardiac twin
- Cord entanglement & interlocking of twins is specific to monoamniotic twins

Q13.9: What do the terms donor twin and recipient twin mean in TTTS?

Answer:

Donor Twin		Recipient Twin
• Oligohydramnios • Growth restricted • Anemic • Renal failure		• Polyhydramnios • Plethoric • Polycythemic • Cardiac failure • Vascular thrombosis

- Risk of cerebral palsy and hydrops can happen in both.

Q13.10: How does the Quintero staging system categorize the severity of TTTS?

Answer:

Stage	Description
Stage 1	One twin has oligohydramnios and other has polyhydramnios
Stage 2	No urine in bladder of donor twin
Stage 3	Abnormal doppler in either twin
Stage 4	Hydrops of either twin
Stage 5	Death of either twin

Q13.11: Is fetal echocardiography included in the Quintero staging system?

Answer: Fetal echo is not a part of Quintero staging, but is generally done in monochorionic twins.

Q13.12: What is the possible intervention for TTTS?

Answer: Fetoscopic laser photocoagulation of vascular anastomosis

- Solomon's technique

Q13.13: What is the antenatal investigation to diagnose Twin Anemia-Polycythemia Sequence (TAPS)?

Answer: MCA Doppler

- MCA-PSV >1.5 MoM in donor twin
- MCA-PSV <1.0 MoM in recipient twin.

Q13.14: What is vanishing twin?

Answer: If one twin dies in 1st trimester and surviving twin continues to grow.

- At later gestation, if one twin dies, there are possibilities of:
  - Other twin dying or permanent neurological damage in the surviving twin
  - More in MC > DC.

Q13.15: What is the best investigation for antenatal determination of chorionicity?

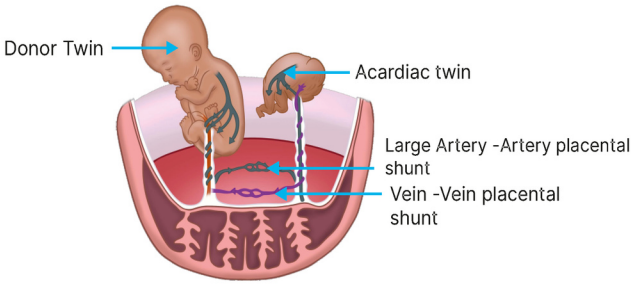
Answer: USG

- Ideal timing: 10-14 weeks (before 14 weeks)
- The outcome of a twin pregnancy depends on chorionicity.

Q13.16: What is Twin Reversed Arterial Perfusion (TRAP) sequence?

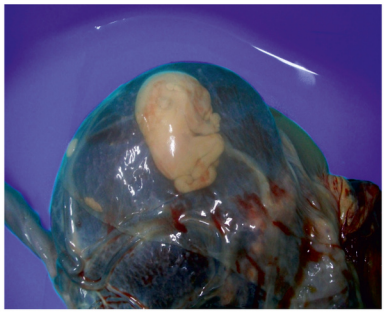
Answer: Donor twin will suffer from cardiac failure → Death

- Aka: Acardiac twin



Q13.17: What is meant by fetus compressus or fetus papyraceus?

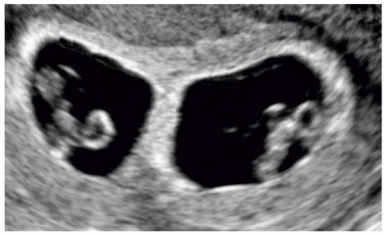
Answer: Death of one twin in early pregnancy.



BIG QUESTION 14: What does Dichorionic Diamniotic (DCDA) mean in twin pregnancy?

Broad Answer: In an early pregnancy scan, 2 separate gestational sacs and 2 placentas represent DCDA.

- MCMA → No intertwin membrane

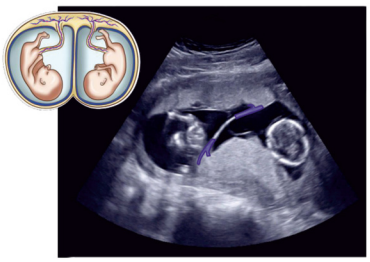


DETAILED QUESTIONS

Q14.1: What is the lambda sign in DCDA?

Answer: Chorion dipping in between the intertwin membrane → DCDA

- Thickness of the intertwin membrane ≥ 2mm.

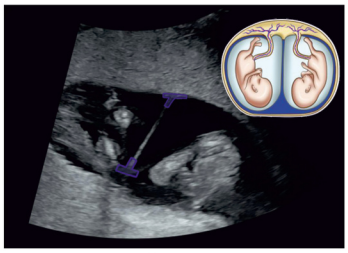


Lambda sign (twin peak)

Q14.2: What does the T sign indicate in a Monochorionic Diamniotic (MCDA) twin pregnancy?

Answer: No chorion dipping → MCDA

- Thickness of the intertwin membrane < 2mm.



T sign

Q14.3: What do placenta look like in twin gestations?

Answer:

Placental Image	Type of Twin Pregnancy
	**DCDA (Dichorionic Diamniotic)** • **Dizygotic**, if: o Opposite sex o Same sex, but different blood group • **Dizygotic/Monozygotic:** o Same sex, same blood group
	**MCDA (Monochorionic Diamniotic)** • Monozygotic
	**MCMA (Monochorionic Monoamniotic)** • Monozygotic

Q14.4: Which investigation is best for zygosity?

Answer: DNA fingerprinting

Q14.5: During which weeks of pregnancy are fetal growth scans performed in twin pregnancy?

Answer:

- Monochorionic Twins: Every 2 weeks
- Dichorionic Twins: Every 4 weeks

Q14.6: At what gestational age should TTTS screening start in MC twin pregnancies?

Answer: 16 weeks onwards

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Q14.7: What is the recommended timing for delivery in twin gestation?

Answer: Timing of delivery:

- Uncomplicated DC: 38 weeks
- Uncomplicated MC: 37 weeks
- MCMA twins: Always deliver by elective cesarean section, scheduled between 32-34 weeks after steroid cover.

Q14.8: What does the mode of delivery in twin gestation depend on?

Answer: Lie and presentation of 1st twin (presenting twin).

- 1st twin vertex: Vaginal delivery
- 1st twin non-vertex: Cesarean section

Q14.9: What is the most common fetal lie in twin pregnancies?

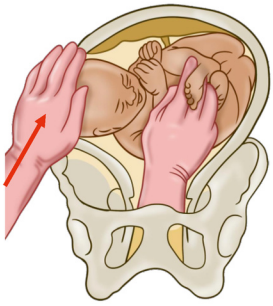
Answer: Both longitudinal

Q14.10: What is the most common fetal presentation in twin pregnancies?

Answer: Both cephalic (vertex).

Q14.11: What is the sole indication for performing an Internal Podalic Version in obstetrics? PYQ: INICET 2020

Answer: 2nd twin in transverse lie



Q14.12: Which twin is associated with the worst prognosis in a twin pregnancy?

Answer: 2nd twin

BIG QUESTION 15: What is the CDC's definition of anemia in pregnancy?

Broad Answer:

- Hb < 11g/dL in 1st and 3rd trimester
- Hb < 10.5g/dL in 2nd trimester

DETAILED QUESTIONS

Q15.1: A primigravida is seen at 32 weeks with easy fatigability. There is no complain of breathlessness, cough or palpitations. Her Hb is 8 g/dL. Peripheral smear shows microcytic hypochromic anemia. She has not been taking oral IFA tabs during pregnancy because they cause her severe nausea and gestational upset. What is the most appropriate treatment?

A. 60 mg elemental Iron once daily

B. 60 mg elemental Iron twice daily

C. IV Iron sucrose

D. Continue oral Iron at lower dose.

Answer: C. IV Iron sucrose

Anemia by WHO	Hb < 11g/dL
Severe anemia	Hb < 7g/dL
Very severe anemia	Hb < 4 g/dL

Q15.2: What is the most common indirect cause of maternal mortality?
Answer: Anemia in pregnancy

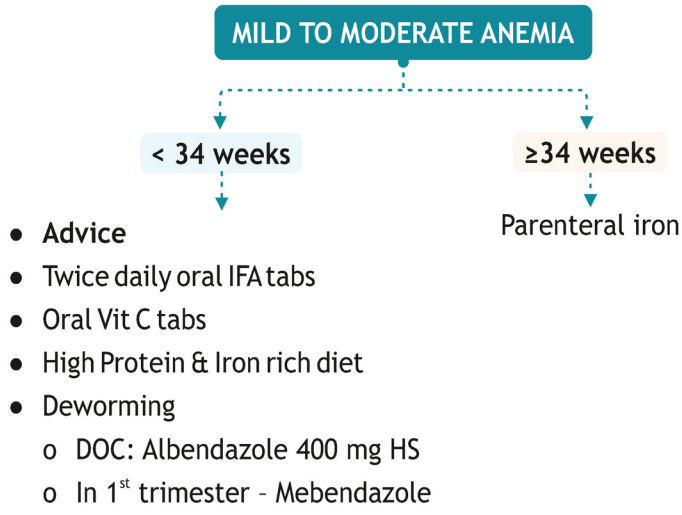
Q15.3: What is the leading cause of anemia in pregnancy?
Answer: Nutritional deficiency

Q15.4: What is the most common type of anemia in pregnancy?
Answer: Iron deficiency anemia

Q15.5: At what intervals is Hb testing done in pregnancy?
Answer: Repeated in each trimester of pregnancy

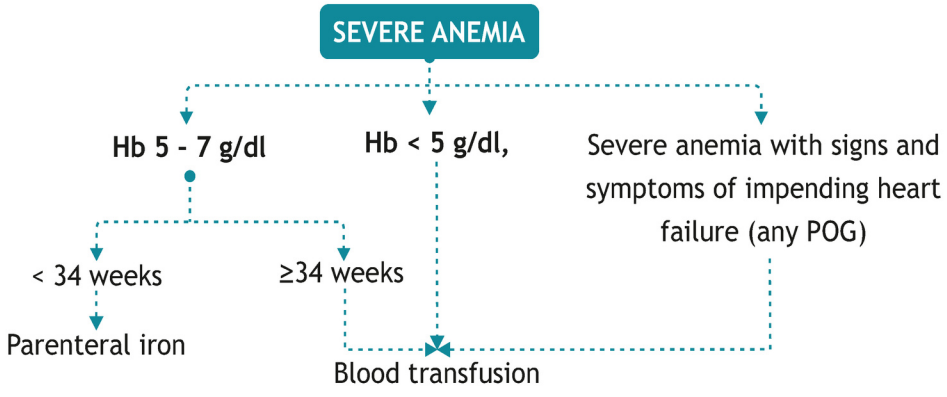
BIG QUESTION 16: What is the management of mild to moderate iron deficiency anemia in pregnancy?

Broad Answer:



DETAILED QUESTIONS

Q16.1: What is the management of severe anemia in pregnancy?
Answer:



Q16.2: What are the reasons for non-response to oral iron therapy?

Answer:

- Non-compliance (mostly due to side effects)
- Continuous blood loss
- Malabsorption
- Incorrect diagnosis (Thalassemia, co-existent folate/vitamin B12 deficiency)
- Co-existent infection

Q16.3: What is the rate of increase in hemoglobin following parenteral (intravenous) iron therapy?

Answer: Same as oral iron

Q16.4: What are the indications of parenteral iron therapy in pregnancy?

Answer:

- Intolerance to oral iron
- Malabsorption
- Ensure compliance

Q16.5: What are the prerequisites for initiating parenteral (intravenous) iron therapy in pregnancy?

Answer:

- Confirm IDA → Iron studies to be done
- Rule out hemoglobinopathies
- C/I in 1st trimester and liver disease
- Stop oral iron atleast 24 hours before
- No test dose required

Q16.6: What is the dose for Parenteral Iron Therapy?

Answer:

- Iron sucrose: 1 vial (100mg Fe) in 100ml of NS → Maximum dose: 600 mg/week
- Ferric carboxymaltose: 1000mg IV infusion can be given as a single dose
  - Dose: 15mg/kg

Q16.7: What is the recommended infusion rate for parenteral iron during pregnancy?

Answer: Rate of infusion should not exceed 1mg/min.

BIG QUESTION 17: Where does amniotic fluid mainly come from?

Broad Answer:

- First 12 weeks: Ultrafiltrate from maternal plasma
- 12 to 20 weeks: Transudate across fetal skin
- Beyond 18 weeks: Fetal urine

DETAILED QUESTIONS

Q17.1: At which gestational week is the maximum amount of amniotic fluid observed?

Answer: 30-32 weeks

Q17.2: When does fetal swallowing start during pregnancy?

Answer: 10 weeks

Q17.3: When does keratinization of the fetal skin start during pregnancy?

Answer: 22-24 weeks

Q17.4: When does the fetus start producing urine during pregnancy?

Answer: 12 weeks

Q17.5: What mechanisms regulate amniotic fluid volume?

Answer:

Amniotic Fluid Volume Regulation	
Increase Amniotic Fluid Volume	**Decrease Amniotic Fluid Volume**
• Fetal urine production (1000mL/day) • Fetal lung secretions (350mL/day)	• Fetal swallowing (750mL/day) • Resorption across chorionic vessels at placenta

BIG QUESTION 18: What are the common abnormalities of amniotic fluid?

Broad Answer: Oligohydramnios and Polyhydramnios

Oligohydramnios	Normal	Polyhydramnios
• AFI: < 5cm • SDP: < 2cm • Absolute amount: <200mL	• AFI: 5-25 cm (more sensitive) • SDP: 2-8 cm (more specific)	• AFI: ≥ 25cm • SDP: ≥ 8cm • Absolute amount: >2000mL
• AFI: Amniotic fluid index • SDP: Single deepest pocket		

DETAILED QUESTIONS

Q18.1: What anomalies are associated with oligohydramnios and polyhydramnios?

Answer: Associated anomalies are:

Oligohydramnios	Polyhydramnios
• Renal agenesis • Infantile PCKD • Posterior urethral valve • Post-term • PROM • Uteroplacental insufficiency	• M/c: GIT > NTDs • M/c: Cleft lip/palate • Esophageal/duodenal atresias • CDH • TEF

- Polyhydramnios + Gross congenital anomalies (GCA) → Risk of Aneuploidy
- Polyhydramnios + Duodenal atresia → Trisomy 21 (Down syndrome)
- Polyhydramnios + GCA + FGR → Trisomy 18 (Edwards syndrome)

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Q18.2: What are the causes of polyhydramnios?

Answer:

- Idiopathic (m/c cause of mild polyhydramnios)
- Multiple pregnancy
- Maternal diabetes
- Fetal hydrops
- Rh-affected fetus
- Chorioangioma of placenta
- Fetal infections

Q18.3: What is the management of polyhydramnios?

Answer:

- Therapeutic amniocentesis (if severe respiratory compromise or risk of early preterm labor).
- Indomethacin (decreases fetal urine production).

Q18.4: What are the potential consequences of early-onset oligohydramnios?

Answer: Risk of pulmonary hypoplasia, compressed facies, and limb contractures.

- If associated with Renal agenesis → **Potter's syndrome**
  - Renal agenesis on USG: Lying down adrenal sign
- If associated with other cause → **Potter's sequence**

Q18.5: What does the keyhole sign on ultrasound suggest?

Answer: Posterior urethral valve

BIG QUESTION 19: What is the most common heart disease affecting pregnant Indian women?

Broad Answer: RHD (rheumatic heart disease), MS (mitral stenosis).

DETAILED QUESTIONS

Q19.1: Which heart disease is most commonly responsible for maternal mortality?

Answer: MS (mitral stenosis)

Q19.2: Which is the most common congenital heart disease in pregnancy?

Answer: ASD (Atrial Septal Defect)

Q19.3: What is the most common congenital valvular heart disease in pregnancy?

Answer: MVP (Mitral Valve Prolapse)

Q19.4: Which cardiac condition carries the maximum risk of maternal mortality?

Answer: Eisenmenger syndrome

Q19.5: In which conditions is pregnancy contraindicated due to a very high risk of maternal mortality, warranting medical termination?

Answer:

- Eisenmenger syndrome/pulmonary HTN
- Marfan syndrome with aortic root dilation (≥40 mm)

- Coarctation with aortic root dilation (≥40 mm)
- Severe AS and MS
- NYHA class III/IV
- Ejection fraction <30%
- H/o peripartum cardiomyopathy with residual dysfunction

Q19.6: When necessary, during which trimester is balloon valvuloplasty typically carried out in pregnancy?

Answer: 2nd trimester

- Valve replacement surgery is contraindicated during pregnancy.

BIG QUESTION 20: What does the term peripartum cardiomyopathy refer to?

Broad Answer: Development of heart failure in the last month of pregnancy or within 5 months of delivery

- But no underlying structural/organic heart lesion → Exact cause uncertain
- Possible role of vasoinhibin implicated

DETAILED QUESTIONS

Q20.1: What are the risk factors for developing postpartum cardiomyopathy?

Answer: Pre-eclampsia and Multiple Pregnancies.

Q20.2: What are the manifestations of peripartum cardiomyopathy?

Answer:

- LV systolic dysfunction
- Reduced EF and dilated LV

Q20.3: How likely is peripartum cardiomyopathy to recur?

Answer: Recurrence occurs in approximately 1/3rd of cases.

BIG QUESTION 21: What is the recommended mode of delivery for patients with heart disease?

Broad Answer: Vaginal

- Induction and augmentation of labor is not contraindicated

DETAILED QUESTIONS

Q21.1: What is the preferred method of analgesia for pregnant patients with heart disease?

Answer: Epidural

- Narcotic analgesia:
  - Aortic stenosis
  - Pulmonary HTN
  - Cyanotic heart disease

Q21.2: When is cesarean section advised for pregnant women with heart disease?

Answer:

- Aortic root dilatation > 4cm
- Aortic aneurysm

- Severe symptomatic AS
- Recent MI
- Acute severe CHF

Q21.3: In which situations during pregnancy is infective endocarditis prophylaxis indicated for high-risk individuals?

Answer: Infective endocarditis prophylaxis (not routine) is indicated for:

- Prosthetic heart valves
- Prior h/o endocarditis
- Unrepaired cyanotic heart disease
- Valvulopathy after heart transplant

Q21.4: What is the drug of choice for infective endocarditis prophylaxis in pregancy?

Answer: Ampicillin 2g IV

- Alternative: Cefazolin IV

BIG QUESTION 22: What teratogenic abnormalities are typically associated with warfarin use?

Broad Answer: Chondrodysplasia

DETAILED QUESTIONS

Q22.1: Which factors raise the risk of teratogenic effects from warfarin?

Answer: Risk highest with daily dose > 5mg.

- Risk of miscarriage and stillbirth

Q22.2: How do you manage pregnancy in a woman receiving warfarin doses above 5 mg per day?

Answer:

- 1st trimester: Switch over from warfarin to LMWH → Continue till 12 weeks
- From 12-36 weeks: Warfarin
- At 36 weeks: Switch back to LMWH

Q22.3: During the peri-delivery period, which heparin is recommended?

Answer: Unfractionated Heparin (UFH) → Stopped once woman is in active labor.

Q22.4: How should a woman who has taken warfarin within the past two weeks be managed if she goes into labor?

Answer:

- Correct INR
- Vitamin K
- FFP (fresh frozen plasma)
- Schedule for cesarean

Q22.5: How should a woman on low molecular weight heparin (LMWH) be managed if she goes into labor?

Answer:

- Stop further dosages
- Vaginal delivery.

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13. MIXED BAG TOPICS

BIG QUESTION 1: What are the key anatomical and physiological changes during puerperium?

Broad Answer: Puerperium refers to the 6-week period following childbirth during which the body undergoes reversal of pregnancy-related changes, especially uterine involution, hormonal adjustments, and systemic normalization.

DETAILED QUESTIONS

Q1.1: What is the duration and beginning point of puerperium?

Answer:

- Duration: 6 weeks
- Begins after placental expulsion

Q1.2: What is involution?

Answer:

- The process by which the uterus returns to its non-pregnant state

Q1.3: What is the fourth trimester?

Answer:

- Time between delivery and 12 weeks postpartum

Q1.4: How does fundal height change during puerperium?

Answer:

Time Postpartum	Fundal Height
Immediately after	Just below umbilicus, uterus weighs ~1000 gm
After 24 hours	Decreases 1.25 cm/day or 1 finger breadth/day
2nd day postpartum	1 finger breadth umbilicus
1 week postpartum	Midway between symphysis pubis & umbilicus
By 10-12 days (2 weeks)	Uterus becomes a pelvic organ
By 4 weeks	Uterus weighs ~100 g

Q1.5: What factors contribute to uterine involution?

Answer:

- Decrease in size of myocytes (not number)
- Multiparous uterus remains heavier than nulliparous

Q1.6: What is lochia and its sequence?

Answer:

- Lochia: Vaginal discharge post-delivery (decidua, blood, WBCs, bacteria)
- Sequence: Rubra → Serosa → Alba
- Duration: 3-5 days

Q1.7: What happens to the decidua during puerperium?

Answer:

- Superficial layer sheds
- Basal layer remains and regenerates endometrium
- Endometrial regeneration by 16 days except placental site (6 weeks)

Q1.8: What are afterpains?

Answer:

- Crampy lower abdominal pain due to uterine contractions
- Common in multiparous women
- Worsens with suckling due to oxytocin
- Gets milder by 3rd day postpartum

Q1.9: What are the causes of uterine subinvolution?

Answer:

Cause
Incompletely remodelled spiral arteries
Infection (endometritis)
Retained tissue
Maternal ill-health, anemia

Q1.10: What cardiovascular and hematologic changes occur during puerperium?

Answer:

Parameter	Change
GFR	Returns to normal by 2 weeks • Postpartum diuresis is physiological
Blood volume	Normal by 1 week
Cardiac output	Normal by 10 days
CO & HR	Remain high for 24-48 hours
WBC count	Increases (physiological)
Fibrinogen	Remains high till 2 weeks post-delivery

Q1.11: How is DVT prevented postpartum?

Answer:

- Encourage early ambulation
- Use pneumatic compression devices

BIG QUESTION 2: What are the physiology and hormonal regulation of lactation?

Broad Answer: Lactation involves the stages of mammary gland development and milk production, regulated primarily by prolactin and oxytocin. The process is influenced by hormonal changes during pregnancy and postpartum stimulation via infant suckling.

DETAILED QUESTIONS

Q2.1: What is the sequence of lactation?

Answer:

- Mammogenesis (during pregnancy) → Lactogenesis (milk synthesis) → Galactokinesis (milk ejection) → Galactopoiesis (maintenance of production)

Q2.2: Which hormones regulate lactation?

Answer:

- Prolactin: Responsible for milk synthesis
- Oxytocin: Responsible for milk ejection

Q2.3: How do prolactin levels change?

Answer:

- Increase throughout pregnancy
- Peak at term
- Decrease after delivery

Q2.4: What initiates milk production and maintains it?

Answer:

- Initiation: Withdrawal of progesterone
- Maintenance: Suckling stimulation

Q2.5: How can milk secretion be promoted or suppressed?

Answer:

- Promote: Encourage infant suckling; dopamine antagonists if needed
- Suppress: Cabergoline (dopamine agonist, contraindicated in hypertension)
  - Alternative - Pyridoxine

BIG QUESTION 3: What are the contraindications to breastfeeding and features of lactational amenorrhea?

Broad Answer: Breastfeeding is generally encouraged, but certain maternal or neonatal conditions may contraindicate it. Lactational amenorrhea is due to prolactin-mediated inhibition of GnRH and provides temporary contraception.

DETAILED QUESTIONS

Q3.1: What are absolute contraindications to breastfeeding?

Answer:

- IV drug abuse
- Maternal alcoholism
- Cytotoxic drugs
- Active herpetic lesions on breast
- Active/untreated pulmonary TB
- Galactosemia in the newborn
- HIV-positive mother

Q3.2: Which infections are not contraindications to breastfeeding?

Answer:

- Hepatitis B
- Mastitis

Q3.3: What is lactational amenorrhea and what are its requirements?

Answer:

- Caused by prolactin-induced GnRH inhibition
- Requirements: Amenorrhea, <6 months postpartum, exclusive breastfeeding including night feeds
- Failure rate: 2%

BIG QUESTION 4: What are the contraceptive considerations in lactating and non-lactating women?

Broad Answer: Contraceptive timing and method differ based on breastfeeding status. Non-breastfeeding women ovulate and menstruate earlier, requiring earlier contraception. Breastfeeding women require specific methods that do not impair lactation.

DETAILED QUESTIONS

Q4.1: When does ovulation and menstruation resume in non-breastfeeding vs breastfeeding women?

Answer:

Group	Ovulation Begins	Menses Return
Non-breastfeeding	By 3 weeks	By 6-8 weeks postpartum
Breastfeeding	By 10 weeks	Later

Q4.2: When should contraception be initiated?

Answer:

- Non-breastfeeding: Start by 3rd week postpartum
- Breastfeeding: Start by 3rd month postpartum

Q4.3: What are the preferred contraceptive options postpartum?

Answer:

- Within 48 hours postpartum: CuT
  - Post-placental CuT can be done < 10mins of placental delivery
- 6 weeks postpartum: CuT > Inj. DMPA
- Note: DMPA not used before 6 weeks in breastfeeding women

Q4.4: When are OCPs contraindicated postpartum?

Answer:

- Up to 6 months in breastfeeding women
- Up to 6 weeks in non-breastfeeding women

BIG QUESTION 5: What are the puerperal complications including pyrexia, mastitis, and sepsis?

Broad Answer: Puerperal abnormalities are complications occurring within 10 days postpartum including fever, breast engorgement, mastitis, and severe infections like puerperal sepsis. Accurate diagnosis and early treatment are crucial to prevent morbidity.

DETAILED QUESTIONS

Q5.1: What is the definition of puerperal pyrexia?

Answer:

- Temperature > 100.4°F (38°C) within first 10 days postpartum and lasts longer than 24hrs (excluding the first 24 hours)
- Requires two separate spikes at least 24 hours apart

Q5.2: What are the common causes of puerperal pyrexia?

Answer:

- Breast engorgement
- Mastitis
- Atelectasis
- Genital/urinary tract infection
- Wound infection
- Foreign body
- Septic pelvic thrombophlebitis
- Deep venous thrombosis

Q5.3: What are the features of mastitis vs. breast engorgement?

Answer:

Feature	Mastitis	Breast Engorgement
Onset	1st week postpartum	Within 2-3 days postpartum
Fever	High-grade	Rarely > 39°C
Breast	U/L, tender, painful swelling	B/L, tense, heavy breasts
Infection source	S. aureus from infant's nose/throat	No infection
Treatment	Dicloxacillin, supportive care	Supportive + expression + feeding fix
Breastfeeding	Not contraindicated	Not contraindicated
No response	Think abscess → Incision & drainage	–

Q5.4: What is puerperal sepsis and its key features?

Answer:

- Metritis with pelvic cellulitis within 42 days of delivery
- Onset: Day 2-3 postpartum
- Key signs: Fever, abdominal pain, uterine tenderness, foul smelling lochia, dirty vaginal discharge
- Vaginal exam: Forniceal tenderness, mass or parametrium induration

Q5.5: What are the causative agents and treatment for puerperal sepsis?

Answer:

- Single most important risk factor - route of delivery
- Most common site of infection following vaginal delivery - Placental site
- Most common site of infection following cesarean section - uterine incision site
- Most infections are polymicrobial > anaerobic

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- Single M/c pathogenic organism - peptostreptococci
- Group A streptococci - Associated with toxic shock syndrome, high grade fever in 1st 24 hours, scant/ odorless lochia
- Gold standard antibiotic - Clindamycin + Gentamycin (Post CS)
  - Require broad-spectrum antibiotic coverage
- Alternative: Ampicillin, gentamycin, metronidazole combination
  - In severe cases: Piperacillin and tazobactam

Q5.6: How is pelvic septic thrombophlebitis diagnosed?

Answer:

- Clinical profile: Persistent spiking fever in a patient with postpartum sepsis despite appropriate antibiotics.
- Blood cultures: Usually negative (due to prior antibiotic use).
- Imaging: Pelvic CT/MRI may demonstrate thrombosed pelvic veins.

Q5.7: How is pelvic septic thrombophlebitis managed?

Answer:

- Continue IV antibiotics.
- Add heparin (anticoagulation) in resistant cases.
- Important differential diagnoses if fever persists:
  - Retained products of conception
  - Pelvic abscess: Diarrhea, fluctuant mass on pelvic exam; confirmed by USG
  - Peritonitis: Guarding, tenderness, rigidity, adynamic ileus
  - Parametrial phlegmon: Tender, indurated mass on uterine side; managed with long-term antibiotics

BIG QUESTION 6: What is fetal hydrops and what are its causes and associations?

Broad Answer: Fetal hydrops is a condition characterized by abnormal fluid accumulation in two or more fetal compartments. It may be immune-mediated or, more commonly, non-immune. Early diagnosis and identification of underlying cause are essential.

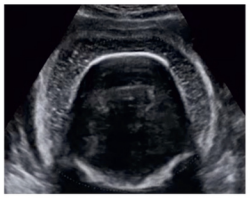
DETAILED QUESTIONS

Q6.1: How is fetal hydrops defined?

Answer:

- Presence of >2 effusions (pleural, pericardial, ascites) OR
- 1 effusion + generalized anasarca (fetal skin thickness >5 mm)





Q6.2: What are the ultrasound signs and associations of fetal hydrops?

Answer:

- Polyhydramnios
- Placentomegaly
- Cardiomegaly
- Hepatosplenomegaly
- Scalp edema (Halo sign/Buddha's sign)

Q6.3: What are the common causes of fetal hydrops?

Answer:

Cause Type	Details
Non-immune (M/C)	Most common overall: Fetal cardiovascular anomalies
Second M/C cause	Fetal chromosomal abnormalities (e.g., Monosomy X = Turner syndrome)
M/C fetal infection	Parvovirus B19 → causes fetal anemia
2nd trimester USG	Most commonly detects Monosomy X

Q6.4: What is mirror syndrome?

Answer:

- Fetal hydrops + maternal edema + placentomegaly
- Associated with ↑ risk of pre-eclampsia

BIG QUESTION 7: How is Rh incompatibility managed in pregnancy and what are its complications?

Broad Answer: Rh incompatibility arises when an Rh-negative mother carries an Rh-positive fetus. Sensitization can lead to hemolytic disease of the fetus and newborn. Prevention and management depend on early detection, antibody titers, and timely intervention.

DETAILED QUESTIONS

Q7.1: What are the clinical manifestations of Rh incompatibility?

Answer:

- Congenital anemia of newborn
- Icterus gravidarum neonatorum
- Fetal anemia
- Fetal hydrops (if fetal hematocrit <15%)

Q7.2: What are key points about maternal sensitization?

Answer:

- Caused by fetomaternal hemorrhage (FMH)
- Minimum volume for sensitization: 0.1 mL
- Risk highest during intrapartum > antepartum (especially 3rd trimester)

Q7.3: What genetic details are important in Rh incompatibility?

Answer:

- Gene for Rh is located on short arm of chromosome 1
- Rh incompatibility: Rh -ve mother carrying Rh + fetus
- 1st pregnancy - usually spared, IgM Ab does not cross placenta
- Once mother is sensitized, she starts synthesizing IgG Ab & outcome worsens with each successive pregnancy
- ABO incompatibility + Rh incompatibility risk of maternal sensitization
- I antigen & Lewis antigen - Minor RBC antigen, not involved in fetal hemolysis
- Kell Ag incompatibility More severe fetal anemia (by suppressing bone marrow RBCs production)

Q7.4: How is Rh sensitization prevented in Rh-negative mothers?

Answer:

- Rh -ve pregnant woman: Check ICT (Check Anti-D Ab in maternal serum) & Husband's blood group
- No fetal risk if mother is Rh -ve & father is also Rh -ve
- If father is Rh +ve- fetus could also be Rh +ve
- Inj. Anti-D, 300um IM given to ICT -ve women at 28 weeks, then again within 72 hrs of delivery, if baby blood group is Rh +ve & Direct Coombs Test -ve

Q7.5: What are the sensitizing events that require anti-D prophylaxis?

Answer:

Event
Abortion, ectopic pregnancy
Invasive procedures (e.g., CVS)
Molar pregnancy
APH, ECV, MRP
IUD evacuation
Medical/surgical abortion <12wks

Q7.6: How is the dose of anti-D determined?

Answer:

- 300 µg Anti-D neutralizes 30 mL of fetal whole blood (≈15 mL fetal RBCs)
- Kleihauer-Betke test (acid elution) used to quantify FMH:
  - FMH (mL) = % fetal cells × 50
  - 10 µg of Anti-D neutralizes 1 mL of FMH

Q7.7: How is an already sensitized Rh-negative mother managed?

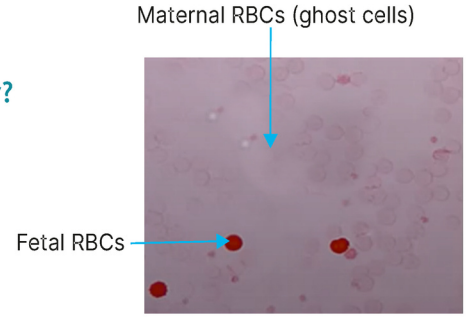
Answer:

- Step 1: Check ICT titer
  - Critical titer = 1:16
- If low → Repeat ICT monthly till 28wks, then biweekly and consider IOL between 38-40 weeks
- If critical → monitor with MCA-PSV (Middle Cerebral Artery- Peak Systolic Velocity) Doppler weekly
- If MCA-PSV ≥ 1.5 MoM:
  - ≥38 wks → deliver
  - <34 wks → cordocentesis
  - If Hct <30% → intrauterine transfusion
  - Goal: Continue pregnancy ≥34 wks

Q7.8: What are the follow-up protocols in a previously isoimmunized mother?

Answer:

- Start MCA-PSV Doppler from 18 weeks onward
- Monitor directly (no need for ICT titers)



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BIG QUESTION 8: How is Down syndrome screened during pregnancy and what are its associated ultrasound and biochemical markers?

Broad Answer: Down syndrome (Trisomy 21) is the most common non-lethal trisomy. Screening is done via biochemical tests, ultrasound markers, and cffDNA. Each trimester offers specific modalities and detection rates.

DETAILED QUESTIONS

Q8.1: What are the different screening tests available for Down syndrome, and what are their components, detection rates, and marker changes?

Answer:

TEST	COMPONENTS	Down syndrome	Trisomy 18
1st trimester combined screening (11 - 13+6 weeks) • Detection rate: 80-84%	• Serum β-HCG • Serum PAPP-A • Nuchal Translucency on TVS	↑ ↓	– –
2nd trimester - Quadruple test (15-20 weeks) • Detection rate: 80%	• Serum β-HCG • MS-AFP • Unconjugated Estriol • Inhibin A	↑ ↓ ↓ ↑	↓ ↓ ↓ x
NIPT Beyond 10 weeks	• cffDNA from maternal blood sample, comes from apoptotic placental trophoblasts • Available for T21, 13, 18, Monosomy X • Limitation - cost		

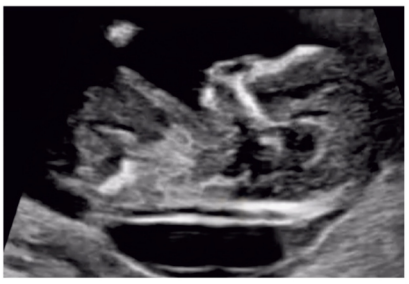
Q8.2: What is the integrated screening and its detection rate?

Answer:

- Combines 1st and 2nd trimester results
- Detection rate: 94-96%

Q8.3: What is NT scan and when is it done?

Answer:



- NT (Nuchal Translucency) = subcutaneous edema behind neck
- Done between 11-14 weeks (CRL = 45-84 mm)
- NT ≥ 3 mm is abnormal
- High risk of: Trisomy 21 > Monosomy X > fetal cardiac anomalies
- Indication for invasive fetal testing if NT ↑
- Useful in twin pregnancies
- Anti-NB scan - Done in 1* trimester (11-14 weeks) when crown rump length measure between 45-84 mm

Q8.4: What are other first-trimester soft markers for Down syndrome on ultrasound?

Answer:

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- Absent nasal bone
- Tricuspid regurgitation
- Abnormal ductus venosus flow

BIG QUESTION 9: What is cystic hygroma and how is it associated with chromosomal and cardiac anomalies?

Broad Answer: Cystic hygroma is a venolymphatic malformation often seen in the first trimester, highly associated with chromosomal and cardiac anomalies depending on the trimester of detection.

DETAILED QUESTIONS

Q9.1: What is cystic hygroma?

Answer:

- Major anomaly due to venolymphatic malformation

Q9.2: What are the associations based on trimester of detection?

Answer:

- 1st trimester: Trisomy 21 > Monosomy X > Trisomy 18 > CVS anomalies (e.g., hypoplastic left heart)
- 2nd trimester: Most commonly Monosomy X

BIG QUESTION 10: What are the key pointers in prenatal aneuploidy screening and confirmatory tests?

Broad Answer: Prenatal screening helps stratify risk of aneuploidies and is offered to all women. Positive results must be confirmed by invasive testing to avoid unnecessary terminations.

DETAILED QUESTIONS

Q10.1: What are the limitations of screening tests?

Answer:

- 5% false positive rate with biochemical tests
- Positive predictive value: 3-5%
- Does not detect all genetic abnormalities

Q10.2: What must be done after a positive screening result?

Answer:

- Always confirm with invasive fetal testing
  - 1st trimester: Chorionic Villus Sampling (CVS)
  - 2nd trimester: Amniocentesis

Q10.3: What is the approach in women with previous Down syndrome child?

Answer:

- Offer invasive fetal testing in subsequent pregnancies
- If translocation type Trisomy 21 and either parent is T(21;21) carrier → 100% recurrence risk

Q10.4: What are second-trimester ultrasound soft markers for Down syndrome?

Answer:

Marker	Note
Nasal bone absence/hypoplasia	Soft marker
Nuchal skin fold thickness >6mm	Highest isolated marker risk
Single transverse palmar crease	Soft marker
Hypoplasia of 5th digit	Clinodactyly
Sandle gap	Between 1st & 2nd toe
Echogenic cardiac focus	Soft marker
Echogenic bowel	Soft marker
Short femur/humerus	Soft marker
Renal pelvis dilatation	Associated with renal anomalies
Single umbilical artery (SUA)	If isolated, mild; if with GCA → high aneuploidy risk

Q10.5: What are key notes on SUA and other associated markers?

Answer:

- SUA common in twins, perinatal deaths, major malformations
- Most fetuses with GCA have SUA
- SUA with GCA on scan → offer invasive testing (Trisomy 18 common)
- M/C GCA with SUA: Renal > Cardiac
- FL/AC <18% suggests skeletal dysplasia (normal = 20-24%)
- Renal pelvis >4 mm (2nd trimester) or >7 mm (3rd trimester) = Ureteropelvic junction obstruction

BIG QUESTION 11: What are neural tube defects (NTDs) and how are they diagnosed and prevented?

Broad Answer: Neural tube defects result from failure of neural tube closure, typically caused by folate deficiency, diabetes, or teratogenic medications. They are detectable via biochemical markers and targeted sonography, and preventable through folic acid supplementation.

DETAILED QUESTIONS

Q11.1: What are diagnostic markers of neural tube defects?

Answer:

- Raised maternal serum AFP (MS-AFP)
  - Abnormal if ≥2.5 MoM
- Open NTDs → ↑ amniotic fluid AFP & acetylcholinesterase

Q11.2: What is the next step after abnormal MS-AFP?

Answer:

- Targeted sonography (Investigation of Choice)

Q11.3: What are the major risk factors for NTDs?

Answer:

- Folate deficiency
- Maternal diabetes
- Anti-epileptic drugs

Q11.4: What is the incidence and prevention of NTDs?

Answer:

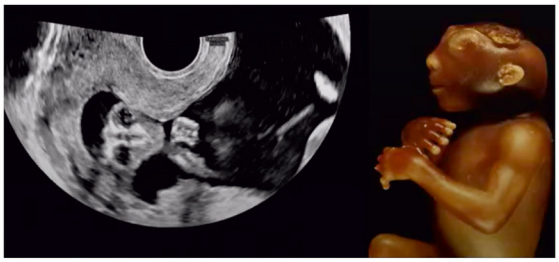
- 2nd most common congenital anomalies
- Prevention:
  - Folic acid ≥1 month before conception through 1st trimester
  - Dose: 400 µg/day (routine)
  - 4 mg/day if:
    - → Previous NTD-affected fetus (5% recurrence)
    - → On antiepileptic drugs
    - → Hemoglobinopathies (due to rapid red cell turnover)
  - For megaloblastic anemia: 1 mg/day

Q11.5: What are the features of anencephaly?

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Answer:

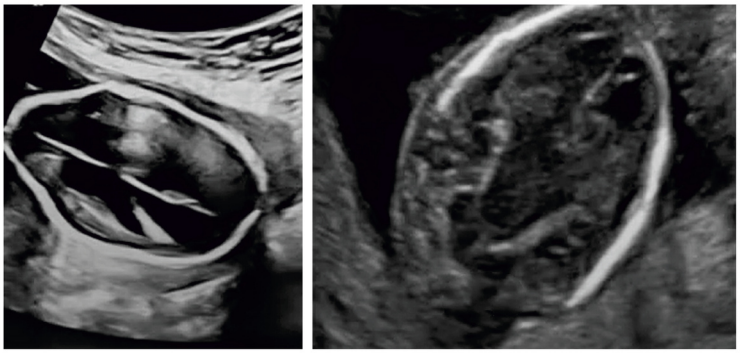
- Anencephaly: Diagnosed by 10-14 weeks



  - USG: Mickey Mouse sign, Frog Eye sign, Shower cap sign
  - Associations: Polyhydramnios (↓ swallowing reflex), Fluid transudation from exposed meninges & brain tissue, No pituitary, Face presentation, Pseudo shoulder dystocia, Post-term > Preterm
  - Signs: Lemon sign, Banana sign (A/w spina bifida)



Lemon sign





Banana sign

BIG QUESTION 12: What are abdominal wall defects and how do they differ?

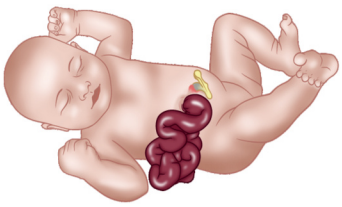
Broad Answer: Abdominal wall defects include omphalocele and gastroschisis, which differ in coverage, associations, and prognosis.

DETAILED QUESTIONS

Q12.1: What is the difference between omphalocele and gastroschisis?

Answer:

Feature	Omphalocele	Gastroschisis
Membrane covering	Present	Absent
Risk of GCA/aneuploidy	High	None
Associations	Major congenital anomalies	Fetal growth restriction
Maternal age group	Any	More common in younger mothers



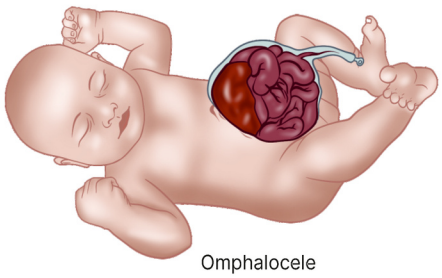
Gastroschisis



Central through umbilicus, covered by thin membrane



Lateral to umbilicus
No membrane covering

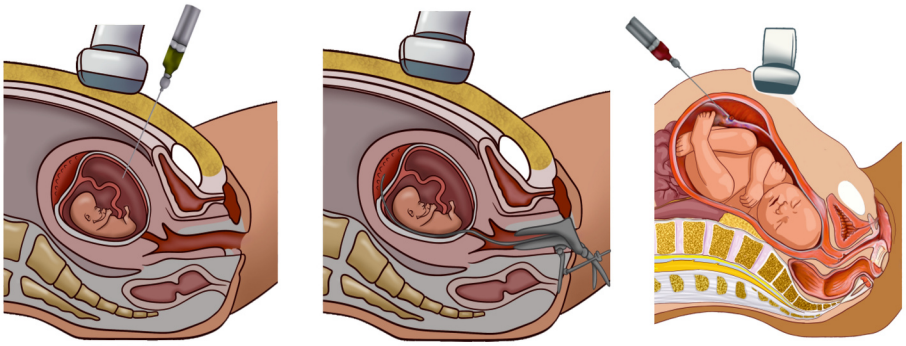


Omphalocele

BIG QUESTION 13: What are the methods of invasive fetal testing and their indications?

Broad Answer:

Invasive fetal tests like amniocentesis, CVS, and cordocentesis help diagnose genetic disorders, fetal infections, anemia, and structural anomalies. Timing, sample type, and diagnostic capabilities differ across methods.



DETAILED QUESTIONS

Q13.1: What are the differences between amniocentesis, CVS, and cordocentesis?

Answer:

Feature	Amniocentesis	Chorionic Villous Sampling (CVS)	Cordocentesis
Timing	After 15 weeks (best: 16-18 wks)	10-13 weeks (early sampling risk: limb defects)	>18 weeks
Sample	Amniocytes, epithelial & GI mucosa cells	Trophoblasts	Blood from umbilical vein
Diagnoses	Genetic disorders, aneuploidy, infections, NTDs	Genetic disorders, aneuploidy (not NTDs)	Fetal anemia, infections
Additional risks	Cell culture delay → 7-10 days for results	Rapid due to active division → 36-48 hr	Sudden fetal bradycardia

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Q13.2: When is fetal microarray analysis preferred?

Answer:

- Major fetal structural anomalies
- Genetic evaluation in stillborn fetuses

BIG QUESTION 14: What are the effects of various drugs in pregnancy and their teratogenic potential?

Broad Answer:

The embryonic period (2nd-8th week post-fertilization) is most sensitive to teratogens. Several medications and exposures during pregnancy can cause congenital anomalies, which makes knowledge of drug safety critical.

DETAILED QUESTIONS

Q14.1: What is the timeline of teratogenic susceptibility?

Answer:

- Embryonic period (2-8 weeks post-fertilization): Maximum risk for malformations
- Fetal period (after 10 weeks LMP): Risk of growth and functional impairment
  - Fetus most susceptible to radiation induced mental retardation between 9-15 weeks

Q14.2: What is the radiation exposure threshold in pregnancy?

Answer:

- No observed adverse effects: <5 rads
- Gross congenital anomalies: >20 rads (0.5 Gy)

Q14.3: What is fetal alcohol syndrome and its features?

Answer:

- Features:
  - Intrauterine growth restriction (IUGR)
  - Mid-facial hypoplasia
  - Microcephaly
  - Short palpebral fissures
  - Smooth philtrum

Q14.4: Which drugs are classically teratogenic?

Answer:

Drug	Teratogenic Effect
Thalidomide	Phocomelia (limb defects)
Valproate	NTDs, cardiac defects, orofacial clefts
Propylthiouracil	Preferred in 1st trimester
Methimazole	Preferred from 2nd trimester onwards Associated with choanal atresia, aplasia cutis
Radioiodine	Contraindicated in pregnancy
Phenytoin	Fetal hydantoin syndrome

ACE inhibitors/ARBs	Oligohydramnios
Warfarin	Chondrodysplasia punctata
Lithium	Ebstein anomaly, neonatal toxicity near delivery
Paroxetine	Cardiac defects

Q14.5: What are important timing considerations for drug cessation?

Answer:

- Radioiodine: Avoid pregnancy for 6 months post-treatment; avoid therapy for 3 months after stopping breastfeeding
- Methotrexate: Avoid pregnancy for 3 months
  - Cause craniofacial anomalies (e.g., cloverleaf skull)
- Acitretin: Avoid pregnancy for 3 years
  - Cause retinoic acid embryopathy
- Tamoxifen: Stop at least 2 months before conception
- Reduce lithium near term (2–3 days before delivery)

Q14.6: What are the precautions for AED use in pregnancy?

Answer:

- Prefer monotherapy with safer drugs, lowest effective dose
- Preferred drugs: Lamotrigine > Levetiracetam
- Dose adjustment ideally before pregnancy
- Seizure frequency usually unchanged in pregnancy
- 10% risk of seizure disorder in offspring
- Breastfeeding not contraindicated

BIG QUESTION 15: What are safe and preferred drugs in pregnancy for infections and chronic illnesses?

Broad Answer: Certain drugs are both safe and effective for managing infections and chronic illnesses during pregnancy. Choosing appropriately helps balance maternal health with fetal safety.

DETAILED QUESTIONS

Q15.1: What is the drug of choice for syphilis in pregnancy?

Answer:

- Benzathine penicillin 2.4 million units IM
  - <1 year duration: 1 dose
  - 1 year or unknown: Weekly × 3 doses

Q15.2: What is Kassowitz's Law?

Answer:

- With untreated maternal syphilis:
  - Likelihood of fetal infection decreases in later pregnancies
  - Vertical transmission rate decreases with time

Q15.3: What is the treatment for malaria in pregnancy?

Answer:

Type	Trimester	Drug(s)
Falciparum (India)	1st trimester	Quinine (per Indian guidelines)
Falciparum (WHO)	1st trimester	ACT also considered safe
Falciparum	2nd & 3rd trimester	ACT therapy
Vivax	All trimesters	Chloroquine → Primaquine postpartum

Q15.4: What is the DOC for DVT prophylaxis in pregnancy?

Answer:

- Low molecular weight heparin (LMWH)

BIG QUESTION 16: How is systemic lupus erythematosus (SLE) managed in pregnancy?

Broad Answer: Pregnancy in women with SLE carries risks of flare, preeclampsia, and poor fetal outcomes. Stable disease before conception and safe medications help reduce complications.

DETAILED QUESTIONS

Q16.1: What is the best time for conception in SLE?

Answer:

- When lupus activity has been silent for ≥6 months

Q16.2: What drugs can be used safely in pregnancy for SLE?

Answer:

- Hydroxychloroquine
- Azathioprine
- Prednisolone
- Tacrolimus

Q16.3: What drugs are contraindicated in pregnancy for SLE?

Answer:

- Methotrexate
- Mycophenolate
- Cyclophosphamide

Q16.4: What is neonatal lupus and its implications?

Answer:

- Caused by anti-SSA (Ro) and anti-SSB (La) antibodies
- Risk of congenital heart block → may require pacemaker

Q16.5: What are the risks in SLE pregnancy?

Answer:

- Increased risk of:

- Preeclampsia
- Lupus nephritis
- APLA/lupus anticoagulant → worsen pregnancy outcome

Q16.6: A 28-year-old primigravida is seen at 16 weeks. She is a known case of SLE & has been in remission for past 1 year. All of the following are true except:

A. Pregnancy outcome is best if lupus activity is silent for at least 6 months before conception
B. Hydroxychloroquine, azathioprine, prednisolone, tacrolimus can be used to manage flares
C. SLE flares for majority of women in pregnancy
D. There is increased risk of preeclampsia

Answer: C. SLE flares for majority of women in pregnancy

- Most women do not have flares; pregnancy outcome is best with disease quiescence.

BIG QUESTION 17: How is acute appendicitis diagnosed and managed in pregnancy?

Broad Answer: Acute appendicitis in pregnancy mimics obstetric and GI conditions. MRI is diagnostic, and early surgical intervention prevents maternal and fetal morbidity.

DETAILED QUESTIONS

Q17.1: What are clinical features of appendicitis in pregnancy?

Answer:

- High-grade fever
- Nausea, vomiting
- Periumbilical tenderness
- Normal fetal status
- Uterus relaxed

Q17.2: What is the investigation of choice in pregnancy?

Answer:

- MRI

Q17.3: What is the preferred treatment?

Answer:

- Antibiotics + immediate laparotomy and appendectomy

Q17.4: What must be ruled out?

Answer:

- Acute cholecystitis
- Pyelonephritis
- Obstetric causes

Q17.5: A 28-year-old primigravida at 30 weeks presented with high grade fever, nausea & vomiting, periumbilical pain for 1 day. USG confirms fetal wellbeing. MRI suggests acute appendicitis. What is the preferred management?

YOURWISH

A. Antibiotics & observation
B. Diagnostic laparoscopy
C. Antibiotics, immediate laparotomy & appendectomy
D. Caesarean section at the time of appendectomy

Answer: C. Antibiotics, immediate laparotomy & appendectomy

- Immediate laparotomy with appendectomy is standard.

BIG QUESTION 18: How is acute pyelonephritis managed during pregnancy?

Broad Answer: Pyelonephritis typically occurs in the second trimester and poses risk of sepsis and preterm labor. Prompt diagnosis and antibiotic therapy are essential.

DETAILED QUESTIONS

Q18.1: What are the clinical features?

Answer:

- Flank pain
- Renal angle tenderness
- Pyuria on urine culture

Q18.2: What are common complications?

Answer:

- Sepsis
- Preterm labor

Q18.3: What is the treatment?

Answer:

- IV fluids
- Maintain urine output ≥50 mL/hr
- IV antibiotics → Switch to oral once afebrile
- Discharge after 24 hrs afebrile

Q18.4: What is the most common pathogen?

Answer:

- E. coli

BIG QUESTION 19: Which maternal-fetal infections are transmitted vertically and how are they managed?

Broad Answer: Vertical transmission can occur transplacentally, during delivery, or via breast milk. Prevention and timely management reduce neonatal complications.

DETAILED QUESTIONS

Q19.1: Which of the following infections is not transmitted perinatally?

A. CMV
B. Rubella
C. HSV
D. Hepatitis B

Answer: B. Rubella

- Rubella transmits transplacentally, not perinatally.

Q19.2: What are common routes of vertical transmission?

Answer:

- Transplacental
- During delivery (birth canal)
- Breastfeeding

Q19.3: What infections are routinely screened during pregnancy?

Answer:

- HIV
- Hepatitis B
- Syphilis
- Selectively: Rubella, GBS

Q19.4: What is congenital rubella syndrome (CRS)?

Answer:

- Most teratogenic infection
- Occurs with maternal infection in 1st trimester
- Classic triad:
  - Cataract
  - Sensorineural deafness
  - Cardiac defects (PDA - most common)
- Confirmed maternal infection → Offer MTP

Q19.5: What is congenital varicella syndrome?

Answer:

- Risk highest between 13-20 weeks
- Features:
  - Cicatricial skin lesions
  - Limb hypoplasia
- Management:
  - Maternal acyclovir if needed
  - Varicella immunoglobulin to newborn if maternal rash occurs 5 days before or up to 7 days after delivery

Q19.6: What to do for exposed pregnant woman without immunity?

Answer:

- If IgG negative: Give Varicella immunoglobulin within 96 hours

Q19.7: What is the most common fetal infection and its features?

Answer:

- Congenital CMV:
  - MCC of congenital brain lesions and childhood deafness
  - Maternal Hx: Flu-like illness, toddler contact
  - No vaccine, no treatment
  - Classic triad:
    - → Chorioretinitis
    - → Microcephaly
    - → Periventricular calcifications

Q19.8: What is congenital toxoplasmosis?

Answer:

- Maternal Hx: Undercooked meat, cat feces
- No risk if infection occurred pre-pregnancy
- If recent infection:
  - Give spiramycin (↓ placental transmission)
  - If confirmed fetal infection: Pyrimethamine + Sulfadiazine
- Classic triad:
  - Chorioretinitis
  - Hydrocephalus
  - o Intracranial calcifications

Q19.9: A pregnant woman at 37 weeks presents in labor with painful herpetic lesions on vulva. Best management?

A. Induction of labor

B. Oral acyclovir & allow spontaneous labor

C. Oral acyclovir & caesarean section

D. Caesarean section

Answer: C. Oral acyclovir & caesarean section

- Concern - To prevent neonatal transmission herpes (peripartum transmission seen more commonly)
- If there is active herpetic lesions on non-genital areas, do occlusive dressing & allow vaginal delivery
- With h/o recurrences during pregnancy or h/o of genital herpes - give suppressive acyclovir therapy from 36 weeks onwards to↓ peripartum viral shedding
- No active genital lesions during pregnancy - Allow vaginal delivery

Big Question 20: What are the key points in HIV management during pregnancy?

Broad Answer: ART is initiated and continued lifelong irrespective of CD4 count. Vaginal delivery is usually preferred, C-section only for obstetric indications. Exclusive breastfeeding with infant ARV prophylaxis is recommended.

Detailed Questions :

Q 20.1: What is the maximum risk period for vertical transmission of HIV?

Answer:

- Peripartum > Intrapartum.

Q 20.2: What is the risk without intervention?

Answer:

- 30-49% with breastfeeding.

Q 20.3: What is the risk with ARV prophylaxis?

Answer:

- Reduced to ~2%.

Q 20.4: What are NACO recommendations?

Answer:

- ART for all pregnant women, lifelong (preferably TLD regimen)
- Vaginal delivery preferred; C-section only for obstetric indication
- Exclusive breastfeeding preferred (avoid mixed feeding)
- Infant gets ARV prophylaxis (single/dual drug depending on risk)

Q 20.5: A 35-year-old woman with previous C-section is found HIV positive at 16 weeks. All of the following are true except:

A. Initiate ART & continue lifelong

B. Vaginal delivery is allowed

C. Elective CS at 37 weeks

D. Breastfeeding is allowed

Answer: B. Vaginal delivery is allowed

- Previous h/o of classical C-section, rupture uterus - Do elective C-section at 37 completed weeks