



La-Net

OBG 501

GENERAL GYNAECOLOGY



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Course code: OBG 501

Course title: General Gynaecology

Course credit load: 3 Units

Series 1: Anatomy and Clinical Evaluation

- **Part 1.1: Bony Pelvis and Pelvic Floor**
 - Sub Part 1.1.1: Bony pelvis and pelvic types
 - Sub Part 1.1.2: Pelvic floor and perineum
 - Sub Part 1.1.3: Pelvic ligaments and support structures
- **Part 1.2: Anatomy of the Female Genital Tract**
 - Sub Part 1.2.1: Vulva and vagina
 - Sub Part 1.2.2: Uterus and cervix
 - Sub Part 1.2.3: Fallopian tubes and ovaries
- **Part 1.3: Blood Supply, Lymphatic Drainage, and Innervation of the Pelvis**
 - Sub Part 1.3.1: Arterial supply of the pelvis and genital tract
 - Sub Part 1.3.2: Venous drainage and lymphatic drainage
 - Sub Part 1.3.3: Innervation of the pelvis and perineum
- **Part 1.4: Laboratory and Imaging Evaluation in Gynaecology**
 - Sub Part 1.4.1: Common laboratory tests in gynaecology
 - Sub Part 1.4.2: Imaging techniques in gynaecology
 - Sub Part 1.4.3: Cervical and endometrial sampling
- **Part 1.5: Surgical Evaluation in Gynaecology**
 - Sub Part 1.5.1: Diagnostic laparoscopy and hysteroscopy
 - Sub Part 1.5.2: Principles of preoperative gynaecological assessment
 - Sub Part 1.5.3: Common gynaecological surgical procedures overview

Introduction



Picture a final-year student standing in for the first time in a gynaecology clinic, faced with a patient describing pelvic pain and irregular bleeding. Without a firm grasp of pelvic anatomy and the tools available to evaluate a gynaecological patient, even a straightforward presentation can feel overwhelming. This Series lays that essential foundation: the anatomy of the bony pelvis, pelvic floor, and female genital tract, together with the laboratory, imaging, and surgical methods used to evaluate the gynaecological patient, the groundwork upon which every subsequent Series in this course will build.

The aim of this Series is to equip you with a sound understanding of pelvic and genital tract anatomy and the principal methods used to evaluate a gynaecological patient.

We shall commence this Series by examining the bony pelvis and pelvic floor, before moving to the detailed anatomy of the female genital tract from the vulva to the ovaries. Next, we will consider the blood supply, lymphatic drainage, and innervation of the pelvis. Following that, our attention turns to laboratory and imaging evaluation in gynaecology. Finally, we will conclude by examining surgical evaluation, including diagnostic laparoscopy, hysteroscopy, and the principles of preoperative assessment.

Series Learning Outcomes

Upon completing this Series, you should be able to:

- **SLO 1.1:** describe the anatomy of the bony pelvis and pelvic floor,
- **SLO 1.2:** describe the gross anatomy of the female genital tract,
- **SLO 1.3:** describe the blood supply, lymphatic drainage, and innervation of the pelvis,
- **SLO 1.4:** describe the common laboratory tests used in gynaecological evaluation,
- **SLO 1.5:** describe the imaging techniques and sampling methods used in gynaecological evaluation, and
- **SLO 1.6:** describe the principles of surgical evaluation in gynaecology.

1.1 Bony Pelvis and Pelvic Floor

1.1.1 Bony pelvis and pelvic types

The bony pelvis is formed by the two innominate (hip) bones, the sacrum, and the coccyx, joined anteriorly at the pubic symphysis and posteriorly at the sacroiliac joints, and is functionally divided into the false pelvis (above the pelvic brim, supporting the abdominal viscera) and the true pelvis (below the brim, through which the fetus must pass during labour), making its dimensions of direct clinical importance in obstetric practice.



Caldwell-Moloy classification describes four basic pelvic shapes, gynaecoid (the classical, most favourable shape for vaginal delivery, round with a wide transverse diameter), android (heart-shaped, narrower and less favourable), anthropoid (oval, with a longer anteroposterior diameter), and platypelloid (flattened, with a short anteroposterior diameter), and while few women have a pure pelvic type, recognising the dominant pattern helps anticipate the likely course and difficulty of labour.

Fill in the blank: The pelvis is divided into the false pelvis and the _____ pelvis by the pelvic brim. The pelvic shape most favourable for vaginal delivery is the _____ type.

1.1.2 Pelvic floor and perineum

The pelvic floor is a muscular diaphragm formed principally by the levator ani (comprising the pubococcygeus, puborectalis, and iliococcygeus muscles) and the coccygeus muscle, spanning the pelvic outlet and supporting the pelvic organs against intra-abdominal pressure, with the puborectalis playing a particularly important role in maintaining the anorectal angle central to faecal continence.

The perineum is divided by an imaginary line between the ischial tuberosities into the anterior urogenital triangle (containing the external genitalia and, in women, the vaginal and urethral openings) and the posterior anal triangle (containing the anal canal), and understanding this division and the underlying muscular layers is essential when assessing and repairing perineal trauma sustained during childbirth.

Fill in the blank: The pelvic floor is formed principally by the _____ ani muscle group. The perineum is divided into the urogenital triangle and the _____ triangle.

1.1.3 Pelvic ligaments and support structures

The uterus and adjacent pelvic organs are supported by a combination of ligaments, fascial condensations, and the pelvic floor musculature, with the cardinal (transverse cervical) ligaments and uterosacral ligaments, both condensations of endopelvic fascia rather than true ligaments in the strict anatomical sense, providing the principal horizontal support to the cervix and upper vagina at the level of the pelvic floor.

The broad ligament is a double fold of peritoneum draping over the uterus, fallopian tubes, and ovarian ligaments, providing a degree of lateral stability while also carrying the uterine vessels, ureter, and round ligament within its layers, and understanding this relationship is of direct surgical relevance, as the ureter's proximity to the uterine artery within the broad ligament is a recognised site of iatrogenic ureteric injury during hysterectomy.

Fill in the blank: The principal horizontal support to the cervix and upper vagina comes from the cardinal and _____ ligaments. Within the broad ligament, the ureter passes close to the _____ artery, a recognised site of surgical injury.



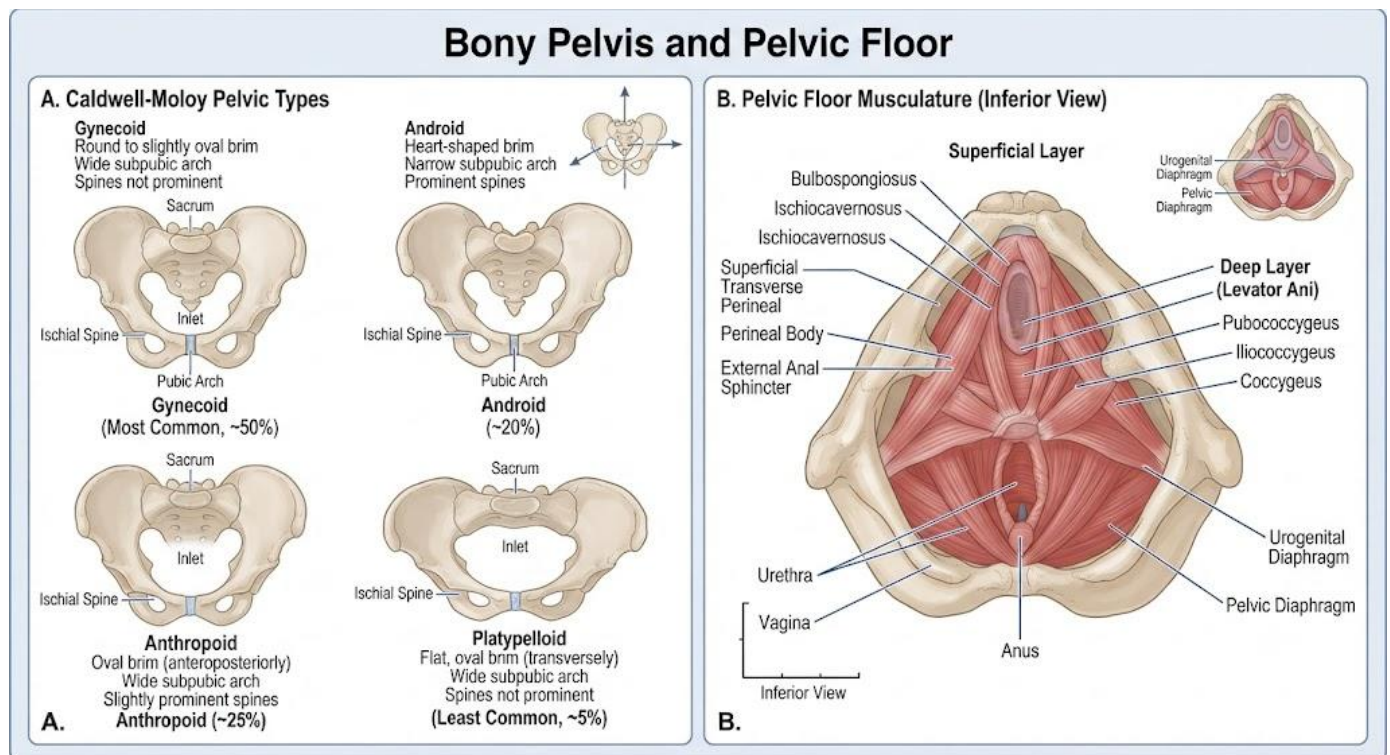


Figure 1.1: The four Caldwell-Moloy pelvic types and the muscular anatomy of the pelvic floor.

Pilot questions 1.1

1. Describe the bones that form the bony pelvis and how they articulate. (Linked to SLO 1.1)
2. Describe the four Caldwell-Moloy pelvic types and their clinical relevance to labour. (Linked to SLO 1.1)
3. Describe the muscles that form the pelvic floor. (Linked to SLO 1.1)
4. Describe the division of the perineum into the urogenital and anal triangles. (Linked to SLO 1.1)
5. Describe the ligamentous and fascial support of the uterus and cervix. (Linked to SLO 1.1)

1.2 Anatomy of the Female Genital Tract

1.2.1 Vulva and vagina

The vulva comprises the external female genitalia, including the mons pubis, labia majora and minora, clitoris, vestibule (into which the urethra and vagina open), and the Bartholin's and Skene's glands, which provide lubrication during sexual arousal and are a recognised site of cystic and abscess formation when their ducts become obstructed or infected.



The vagina is a fibromuscular canal extending from the vulva to the cervix, lined by non-keratinised stratified squamous epithelium that is hormonally responsive, undergoing cyclical change under oestrogen influence, and surrounding the cervix to form the anterior, posterior, and lateral fornices, the posterior fornix being of particular clinical importance as it lies in close proximity to the pouch of Douglas, allowing transvaginal access for procedures such as culdocentesis.

Fill in the blank: The glands responsible for vaginal lubrication that can become obstructed and form a cyst or abscess are the _____ glands. The posterior vaginal fornix lies close to the pouch of _____.

1.2.2 Uterus and cervix

The uterus is a pear-shaped, muscular organ divided into the fundus, body (corpus), and cervix, normally lying in a position of anteversion and anteflexion, composed of three layers, the outer perimetrium (serosa), the middle myometrium (smooth muscle, responsible for the contractile force of labour), and the inner endometrium (which undergoes cyclical proliferation and shedding under hormonal control, forming the basis of the menstrual cycle).

The cervix is the lower, narrower portion of the uterus, comprising the endocervix (lined by columnar epithelium) and the ectocervix (lined by stratified squamous epithelium), meeting at the squamocolumnar junction, a site of particular clinical significance as the transformation zone where the great majority of cervical dysplasia and carcinoma arise, making it the focus of cervical screening technique.

Fill in the blank: The middle muscular layer of the uterus responsible for the contractile force of labour is the _____. The site where endocervical and ectocervical epithelium meet is called the _____ junction.

1.2.3 Fallopian tubes and ovaries

The fallopian tubes extend laterally from the uterine cornua and are divided into four segments, the interstitial (intramural) portion within the uterine wall, the narrow isthmus, the wider ampulla (the usual site of fertilisation), and the fimbriated infundibulum, which drapes over the ovary to capture the released oocyte at ovulation, a process dependent on ciliary action and tubal peristalsis working together.

The ovaries are almond-shaped organs suspended by the mesovarium (part of the broad ligament), the ovarian ligament (connecting the ovary to the uterus), and the suspensory ligament of the ovary (infundibulopelvic ligament, carrying the ovarian vessels from the pelvic sidewall), the latter being of particular surgical relevance as it must be carefully identified and ligated during oophorectomy to avoid inadvertent injury to the ureter, which runs in close proximity.

Fill in the blank: Fertilisation of the oocyte usually occurs within the _____ of the fallopian tube. The suspensory ligament of the ovary is also known as the _____ ligament.



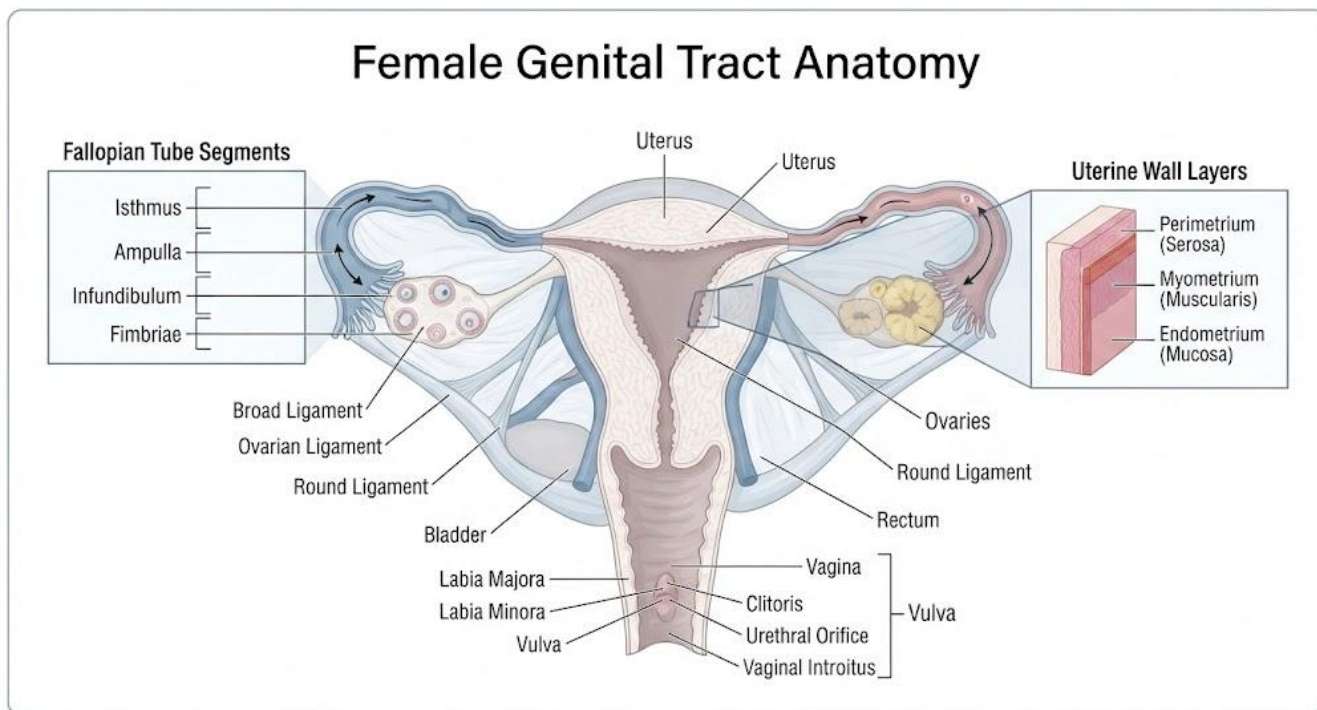


Figure 1.2: Anatomy of the female genital tract from the vulva to the ovaries.

Pilot questions 1.2

1. Describe the structures that make up the vulva. (Linked to SLO 1.2)
2. Describe the anatomical relations of the posterior vaginal fornix. (Linked to SLO 1.2)
3. Describe the layers of the uterine wall and their function. (Linked to SLO 1.2)
4. Explain the clinical significance of the squamocolumnar junction of the cervix. (Linked to SLO 1.2)
5. Describe the segments of the fallopian tube and the site of fertilisation. (Linked to SLO 1.2)

1.3 Blood Supply, Lymphatic Drainage, and Innervation of the Pelvis

1.3.1 Arterial supply of the pelvis and genital tract

The internal iliac artery is the principal source of blood supply to the pelvic organs, dividing into anterior and posterior divisions, with the anterior division giving rise to the uterine artery (which crosses over the ureter, an anatomical relationship summarised by the teaching phrase *water under the bridge*, of central surgical importance during hysterectomy) and the vaginal and vesical arteries.



The ovarian arteries arise directly from the abdominal aorta, just below the renal arteries, reflecting the embryological origin and descent of the ovaries from a high abdominal position, and anastomose with the uterine arteries within the broad ligament, providing collateral supply to the uterus and explaining why uterine artery ligation alone does not fully devascularise the uterus in cases of postpartum haemorrhage.

Fill in the blank: The uterine artery crosses over the _____, a relationship summarised by the teaching phrase water under the bridge. The ovarian arteries arise directly from the _____.

1.3.2 Venous drainage and lymphatic drainage

Venous drainage of the pelvic organs largely mirrors the arterial supply, draining via the internal iliac veins, with the notable exception of the ovarian veins, which drain asymmetrically, the right ovarian vein draining directly into the inferior vena cava while the left drains into the left renal vein, an asymmetry that has practical relevance when interpreting pelvic venous imaging or planning surgery in this region.

Lymphatic drainage of the female genital tract follows distinct pathways depending on the organ: the vulva drains predominantly to the superficial and deep inguinal nodes, the cervix and lower uterine segment to the obturator, internal, and external iliac nodes, the uterine fundus and ovaries to the para-aortic nodes (following the ovarian vessels), understanding of which underpins the surgical staging and lymph node dissection performed for gynaecological malignancy.

Fill in the blank: The right ovarian vein drains directly into the _____, while the left drains into the left renal vein. Lymphatic drainage of the vulva is predominantly to the _____ nodes.

1.3.3 Innervation of the pelvis and perineum

Autonomic innervation of the pelvic organs arises from the inferior hypogastric (pelvic) plexus, receiving sympathetic fibres from the hypogastric nerves and parasympathetic fibres from the pelvic splanchnic nerves (S2 to S4), together mediating uterine contractility, vascular tone, and visceral sensation, with visceral pain from the uterine body typically referred to the lower abdomen via sympathetic pathways.

The pudendal nerve (arising from S2 to S4) provides somatic sensory and motor innervation to the perineum, including the external genitalia and the external anal and urethral sphincters, and is the target of pudendal nerve block used to provide anaesthesia for instrumental vaginal delivery and perineal repair, administered classically at the ischial spine where the nerve is most accessible.

Fill in the blank: The pudendal nerve arises from spinal segments _____. Pudendal nerve block is classically administered at the level of the ischial _____.



Organ	Arterial Supply	Venous Drainage	Lymphatic Drainage
Vulva	Branches of internal pudendal artery	Internal pudendal vein	Superficial inguinal lymph nodes
Vagina	Vaginal artery (from internal iliac), uterine artery branches	Vaginal venous plexus → internal iliac vein	Internal iliac, sacral, superficial inguinal lymph nodes
Cervix	Uterine artery branches	Uterine venous plexus → internal iliac vein	Internal iliac, sacral lymph nodes
Uterus	Uterine artery (from internal iliac), ovarian artery contribution	Uterine venous plexus → internal iliac vein	Internal iliac, sacral, para-aortic lymph nodes
Ovaries	Ovarian artery (from abdominal aorta)	Ovarian vein → left renal vein (left), IVC (right)	Para-aortic (lumbar) lymph nodes

Table 1.3: Summary of the vascular and lymphatic drainage of the female genital tract.

Pilot questions 1.3

1. Describe the arterial supply of the uterus and its anatomical relationship to the ureter. (Linked to SLO 1.3)
2. Explain the origin of the ovarian arteries and its embryological basis. (Linked to SLO 1.3)
3. Describe the asymmetry in ovarian venous drainage. (Linked to SLO 1.3)
4. Describe the lymphatic drainage pathways of the vulva, cervix, and uterine fundus. (Linked to SLO 1.3)
5. Describe the innervation of the perineum and the clinical use of pudendal nerve block. (Linked to SLO 1.3)

1.4 Laboratory and Imaging Evaluation in Gynaecology

1.4.1 Common laboratory tests in gynaecology

Laboratory evaluation of the gynaecological patient commonly includes a full blood count (assessing for anaemia from menstrual blood loss or infection), serum beta-human chorionic gonadotropin (essential in any woman of reproductive age presenting with abnormal bleeding or pain, to exclude pregnancy and, specifically, ectopic pregnancy), and hormonal assays (follicle-stimulating hormone, luteinising hormone, oestradiol, and prolactin) used to investigate menstrual irregularity, infertility, and suspected menopause.



Additional targeted tests include tumour markers such as CA-125 (raised in ovarian malignancy but also in benign conditions including endometriosis and pelvic inflammatory disease, limiting its specificity when used in isolation), coagulation studies in women with heavy menstrual bleeding, and microbiological swabs (high vaginal and endocervical) to identify infective causes of abnormal discharge or pelvic pain.

Fill in the blank: In any woman of reproductive age with abnormal bleeding or pain, serum _____ should be checked to exclude pregnancy. The tumour marker commonly used, though non-specific, in the evaluation of a suspected ovarian mass is _____.

1.4.2 Imaging techniques in gynaecology

Transvaginal ultrasound is the first-line imaging investigation in gynaecology, offering superior resolution of the uterus, endometrium, and ovaries compared with the transabdominal approach, and is used to assess for fibroids, ovarian cysts and masses, endometrial thickness in abnormal bleeding, and early pregnancy viability and location, making it the cornerstone investigation across the great majority of gynaecological presentations.

Further imaging includes magnetic resonance imaging, valuable for detailed characterisation of complex adnexal masses, staging of gynaecological malignancy, and assessment of deep infiltrating endometriosis, and hysterosalpingography, a contrast study of the uterine cavity and fallopian tubes used principally in the investigation of infertility to assess tubal patency and uterine cavity abnormalities such as septae or adhesions.

Fill in the blank: The first-line imaging investigation in gynaecology is _____ ultrasound. A contrast study used to assess tubal patency in infertility investigation is _____.

1.4.3 Cervical and endometrial sampling

Cervical cytology (Pap smear) screens for pre-malignant and malignant change at the squamocolumnar transformation zone, sampling both the ectocervix and endocervical canal, and, where available, high-risk human papillomavirus (HPV) testing is now used alongside or in place of cytology in many modern screening programmes, reflecting the established causal role of persistent high-risk HPV infection in cervical carcinogenesis.

Endometrial sampling (by outpatient pipelle biopsy or, where indicated, dilatation and curettage under anaesthesia) is performed to investigate abnormal uterine bleeding, particularly postmenopausal bleeding, which should always be considered endometrial carcinoma until proven otherwise given its strong association with malignancy in this age group, making prompt, thorough endometrial assessment a clinical priority whenever it occurs.

Fill in the blank: Cervical cytology samples the transformation zone to screen for pre-malignant change at the _____ junction. Postmenopausal bleeding should always be considered _____ carcinoma until proven otherwise.



Investigation	Indication
<u>FBC</u>	Assess anaemia, infection, or overall haematological status.
<u>Beta-hCG</u>	Confirm pregnancy, evaluate ectopic pregnancy, monitor trophoblastic disease.
<u>Hormonal Assays</u>	Assess ovarian function, endocrine disorders (FSH, LH, prolactin, thyroid hormones).
<u>CA-125</u>	Tumour marker for ovarian cancer, also elevated in benign conditions.
<u>Transvaginal Ultrasound</u>	First-line imaging for pelvic masses, endometrial thickness, early pregnancy.
<u>MRI</u>	Detailed imaging for complex pelvic pathology, staging of malignancies.
<u>Hysterosalpingography</u>	Evaluate uterine cavity and fallopian tube patency in infertility workup.
<u>Cervical Cytology</u>	Screening for cervical intraepithelial neoplasia and carcinoma.
<u>Endometrial Biopsy</u>	Diagnose abnormal uterine bleeding, endometrial hyperplasia, or carcinoma.

Box 1.4: Summary of common laboratory and imaging investigations in gynaecology.

Pilot questions 1.4

1. Explain why serum beta-hCG should be checked in any woman of reproductive age with abnormal bleeding or pain. (Linked to SLO 1.4)
2. Describe the limitations of CA-125 as a tumour marker. (Linked to SLO 1.4)
3. Explain why transvaginal ultrasound is the first-line imaging investigation in gynaecology. (Linked to SLO 1.5)
4. Describe the role of hysterosalpingography in the investigation of infertility. (Linked to SLO 1.5)
5. Explain why postmenopausal bleeding requires prompt endometrial assessment. (Linked to SLO 1.5)

1.5 Surgical Evaluation in Gynaecology

1.5.1 Diagnostic laparoscopy and hysteroscopy

Diagnostic laparoscopy allows direct visualisation of the pelvic organs, peritoneal surfaces, and any adhesions or endometriotic deposits through small abdominal incisions, and remains an important investigation in the evaluation of chronic pelvic pain and unexplained infertility when



non-invasive imaging has failed to identify a cause, offering both diagnostic clarity and, frequently, the opportunity for simultaneous therapeutic intervention.

Hysteroscopy provides direct visualisation of the uterine cavity via a scope passed through the cervix, allowing identification of intracavitary pathology such as polyps, submucosal fibroids, and adhesions (Asherman's syndrome), and, like laparoscopy, offers the option of combining diagnosis with immediate therapeutic resection in appropriately selected patients, reducing the need for a separate procedure.

Fill in the blank: Diagnostic laparoscopy is particularly valuable in the evaluation of chronic pelvic pain and unexplained _____. Intrauterine adhesions identified on hysteroscopy are known as _____ syndrome.

1.5.2 Principles of preoperative gynaecological assessment

Preoperative assessment before gynaecological surgery includes a thorough history and examination, relevant imaging to characterise the pathology and plan the surgical approach, assessment of fitness for anaesthesia, and counselling that covers the indication, alternatives, expected benefits, and specific risks of the proposed procedure, forming the basis of properly informed consent, a principle of particular importance in gynaecological surgery given its direct implications for future fertility.

Special consideration is given in reproductive-age women to the impact of surgery on future fertility, with fertility-preserving approaches (such as myomectomy rather than hysterectomy for fibroids, or ovarian cystectomy rather than oophorectomy where feasible) discussed and, where appropriate and desired by the patient, prioritised over more radical alternatives that would otherwise achieve the same immediate therapeutic goal.

Fill in the blank: Preoperative counselling covering indication, alternatives, and risks forms the basis of properly informed _____. In reproductive-age women, fertility-preserving surgery such as _____ may be preferred over hysterectomy for fibroids.

1.5.3 Common gynaecological surgical procedures overview

Common minor procedures include dilatation and curettage (cervical dilatation with endometrial curettage, used both diagnostically for abnormal bleeding and therapeutically for incomplete miscarriage), and cervical excisional treatments such as loop electrosurgical excision procedure (LEEP), used to treat confirmed high-grade cervical dysplasia identified on colposcopy-directed biopsy.

Major procedures include myomectomy (removal of fibroids with uterine preservation), hysterectomy (removal of the uterus, performed abdominally, vaginally, or laparoscopically depending on uterine size, pathology, and surgeon expertise), and salpingo-oophorectomy (removal of the fallopian tube and ovary), each requiring careful patient selection and counselling regarding the specific risks, recovery, and long-term implications for fertility and hormonal function.



Fill in the blank: Cervical dilatation with endometrial curettage is used both diagnostically and therapeutically for incomplete _____. The excisional treatment used for confirmed high-grade cervical dysplasia is _____.

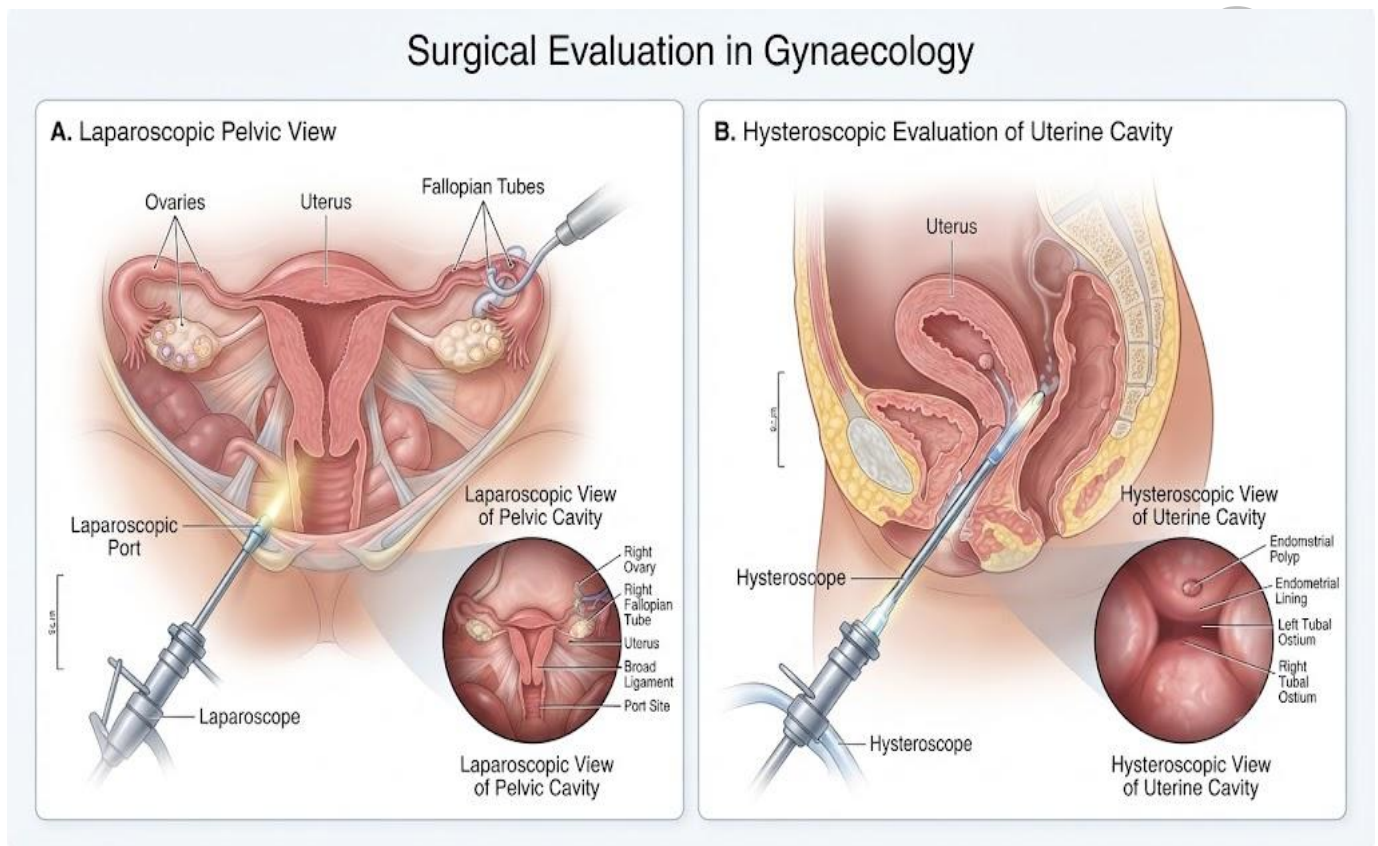


Figure 1.5: Diagnostic laparoscopy and hysteroscopy in the evaluation of the gynaecological patient.

Pilot questions 1.5

1. Describe the indications for diagnostic laparoscopy in gynaecological practice. (Linked to SLO 1.6)
2. Describe the role of hysteroscopy in the evaluation of intracavitary uterine pathology. (Linked to SLO 1.6)
3. Describe the key components of preoperative gynaecological assessment. (Linked to SLO 1.6)
4. Explain why fertility preservation is a special consideration in gynaecological surgery. (Linked to SLO 1.6)
5. Compare myomectomy and hysterectomy as surgical options for fibroids. (Linked to SLO 1.6)



Series Summary

This Series has covered the anatomy of the bony pelvis and pelvic floor, followed by the detailed anatomy of the female genital tract from the vulva to the ovaries. It went on to examine the blood supply, lymphatic drainage, and innervation of the pelvis, before addressing the laboratory and imaging methods used to evaluate the gynaecological patient, and concluding with surgical evaluation, including diagnostic laparoscopy, hysteroscopy, and the principles of preoperative assessment.

You should now be able to describe the anatomy of the bony pelvis and pelvic floor, describe the gross anatomy of the female genital tract, describe its blood supply, lymphatic drainage, and innervation, describe the common laboratory and imaging investigations in gynaecology, and describe the principles of surgical evaluation in gynaecological practice (Linked to SLOs 1.1 to 1.6).

Glossary of Terms

- **Asherman's syndrome:** intrauterine adhesions identified on hysteroscopy, often following uterine instrumentation or infection.
- **Caldwell-Moloy classification:** a system describing four basic pelvic shapes: gynaecoid, android, anthropoid, and platypelloid.
- **Cardinal ligament:** a condensation of endopelvic fascia providing horizontal support to the cervix and upper vagina, also called the transverse cervical ligament.
- **Hysterosalpingography:** a contrast imaging study of the uterine cavity and fallopian tubes, used to assess tubal patency in infertility investigation.
- **Infundibulopelvic ligament:** the suspensory ligament of the ovary, carrying the ovarian vessels from the pelvic sidewall.
- **Levator ani:** the principal muscle group of the pelvic floor, comprising the pubococcygeus, puborectalis, and iliococcygeus.
- **Pudendal nerve:** a nerve arising from S2 to S4 providing somatic sensory and motor innervation to the perineum.
- **Squamocolumnar junction:** the point where endocervical columnar epithelium meets ectocervical squamous epithelium, the site of origin of most cervical dysplasia.



- **Transvaginal ultrasound:** the first-line imaging investigation in gynaecology, offering superior resolution of the uterus and ovaries.
- **Water under the bridge:** a teaching phrase describing the uterine artery crossing over the ureter, of central surgical importance in hysterectomy.
- **CA-125:** a tumour marker raised in ovarian malignancy but also in benign conditions such as endometriosis, limiting its specificity.
- **Pipelle biopsy:** an outpatient method of endometrial sampling used to investigate abnormal uterine bleeding.

Concept Check Questions [Series 1]

Objective questions

1. The pelvic shape most favourable for vaginal delivery is the _____ type.
2. The middle muscular layer of the uterus responsible for the contractile force of labour is the _____.
3. The uterine artery crosses over the _____, a relationship summarised by the teaching phrase water under the bridge.
4. The first-line imaging investigation in gynaecology is _____ ultrasound.
5. Intrauterine adhesions identified on hysteroscopy are known as _____ syndrome.

Short-answer questions

6. Describe the division of the perineum into the urogenital and anal triangles. (Linked to SLO 1.1)
7. Explain the clinical significance of the squamocolumnar junction of the cervix. (Linked to SLO 1.2)
8. Describe the asymmetry in ovarian venous drainage. (Linked to SLO 1.3)
9. Describe the limitations of CA-125 as a tumour marker. (Linked to SLO 1.4)
10. Compare myomectomy and hysterectomy as surgical options for fibroids. (Linked to SLO 1.6)

Long-answer questions



11. Describe the anatomy of the bony pelvis, pelvic floor, and perineum. (Linked to SLO 1.1)
12. Describe the anatomy of the female genital tract from the vulva to the ovaries. (Linked to SLO 1.2)
13. Describe the blood supply and lymphatic drainage of the female genital tract. (Linked to SLO 1.3)
14. Describe the laboratory and imaging investigations used in gynaecological evaluation. (Linked to SLO 1.4, SLO 1.5)
15. Describe the role and principles of surgical evaluation in gynaecology. (Linked to SLO 1.6)

Answers to Concept Check Questions [Series 1]

Objective questions

1. Gynaecoid.
2. Myometrium.
3. Ureter.
4. Transvaginal.
5. Asherman's.

Short-answer questions

6. The urogenital triangle contains the external genitalia and urethral and vaginal openings; the anal triangle contains the anal canal, divided by a line between the ischial tuberosities.
7. The squamocolumnar junction is the transformation zone where most cervical dysplasia and carcinoma arise, making it the focus of cervical screening.
8. The right ovarian vein drains directly into the inferior vena cava, while the left drains into the left renal vein.
9. CA-125 is raised in ovarian malignancy but also in benign conditions such as endometriosis and pelvic inflammatory disease, limiting its specificity used alone.
10. Myomectomy preserves the uterus and fertility, suiting women wishing to conceive, while hysterectomy is definitive but ends fertility, suiting those who have completed childbearing.



Long-answer questions

11. **Basic response:** The bony pelvis is formed by the innominate bones, sacrum, and coccyx, with the pelvic floor formed by the levator ani and coccygeus muscles supporting the pelvic organs.

Value-added response: The Caldwell-Moloy classification and the division of the perineum into urogenital and anal triangles both carry direct relevance to labour and perineal trauma assessment.

12. **Basic response:** The female genital tract comprises the vulva, vagina, uterus, fallopian tubes, and ovaries, each with distinct anatomical relations and clinical significance.

Value-added response: The squamocolumnar junction of the cervix and the ampulla of the fallopian tube are of particular clinical importance for cervical screening and fertilisation respectively.

13. **Basic response:** The internal iliac artery supplies the pelvic organs via the uterine, vaginal, and vesical arteries, with lymphatic drainage following distinct pathways by organ.

Value-added response: The uterine artery's relationship to the ureter, and the asymmetric ovarian venous drainage, both carry direct surgical relevance in gynaecological practice.

14. **Basic response:** Laboratory evaluation includes FBC, beta-hCG, and hormonal assays, while transvaginal ultrasound is the first-line imaging investigation across most gynaecological presentations.

Value-added response: Postmenopausal bleeding should always prompt endometrial sampling given its strong association with malignancy in this age group.

15. **Basic response:** Surgical evaluation includes diagnostic laparoscopy and hysteroscopy, offering direct visualisation and often simultaneous therapeutic intervention.

Value-added response: Preoperative assessment in reproductive-age women should specifically address fertility preservation, favouring less radical alternatives where clinically appropriate.

Answers to Pilot Questions [Series 1]

Part 1.1

1. The two innominate bones, sacrum, and coccyx, joined at the pubic symphysis anteriorly and sacroiliac joints posteriorly.



2. Gynaecoid, android, anthropoid, and platypelloid, with gynaecoid being most favourable for vaginal delivery.
3. The levator ani (pubococcygeus, puborectalis, iliococcygeus) and coccygeus muscles.
4. A line between the ischial tuberosities divides the perineum into the anterior urogenital triangle and posterior anal triangle.
5. The cardinal and uterosacral ligaments provide horizontal support, with the broad ligament providing lateral stability.

Part 1.2

1. The mons pubis, labia majora and minora, clitoris, vestibule, and Bartholin's and Skene's glands.
2. The posterior fornix lies close to the pouch of Douglas, allowing transvaginal access for procedures such as culdocentesis.
3. The perimetrium (serosa), myometrium (contractile muscle), and endometrium (hormonally responsive lining).
4. It is the transformation zone where most cervical dysplasia and carcinoma arise, making it the focus of screening.
5. The fallopian tube has interstitial, isthmus, ampulla, and infundibulum segments, with fertilisation usually occurring in the ampulla.

Part 1.3

1. The uterine artery arises from the anterior division of the internal iliac artery and crosses over the ureter.
2. The ovarian arteries arise from the abdominal aorta below the renal arteries, reflecting the ovaries' high embryological origin.
3. The right ovarian vein drains into the inferior vena cava, while the left drains into the left renal vein.
4. The vulva drains to inguinal nodes, the cervix to obturator and iliac nodes, and the fundus and ovaries to para-aortic nodes.
5. The pudendal nerve (S2 to S4) innervates the perineum, and pudendal block is administered at the ischial spine for delivery anaesthesia.



Part 1.4

1. To exclude pregnancy, particularly ectopic pregnancy, which must not be missed in a woman with abnormal bleeding or pain.
2. CA-125 is raised in benign conditions such as endometriosis and pelvic inflammatory disease, limiting its specificity for malignancy.
3. It offers superior resolution of the uterus and ovaries compared with the transabdominal approach and is widely accessible.
4. It assesses tubal patency and uterine cavity abnormalities such as septae or adhesions in the investigation of infertility.
5. Postmenopausal bleeding is strongly associated with endometrial carcinoma and should be considered malignant until proven otherwise.

Part 1.5

- Chronic pelvic pain and unexplained infertility when non-invasive imaging has failed to identify a cause.
- It identifies intracavitary pathology such as polyps, submucosal fibroids, and adhesions, often with simultaneous treatment.
- History, examination, relevant imaging, fitness for anaesthesia assessment, and counselling covering risks and alternatives.
- Surgery may affect future fertility, so fertility-preserving alternatives should be discussed and prioritised where appropriate.
- Myomectomy preserves the uterus for future fertility, while hysterectomy is definitive but ends childbearing potential.

References and Attributions [Series 1]

Textual References

- Hoffman, B. L., Schorge, J. O., Halvorson, L. M. et al. (2020). Williams Gynecology (4th ed.). McGraw Hill.
- Berek, J. S. and Berek, D. L. (2019). Berek and Novak's Gynecology (16th ed.). Wolters Kluwer.



- Standing, S. (Ed.) (2020). Gray's Anatomy: The Anatomical Basis of Clinical Practice (42nd ed.). Elsevier.
- Royal College of Obstetricians and Gynaecologists (2021). Green-top Guidelines: Diagnostic Laparoscopy and Hysteroscopy. RCOG Press.

Figures, Plates, Tables, and Boxes

- Figure 1.1: The four Caldwell-Moloy pelvic types and the muscular anatomy of the pelvic floor. AI-generated using the prompt: "Create a professional two-panel medical diagram titled Bony Pelvis and Pelvic Floor, showing the four Caldwell-Moloy pelvic types and the pelvic floor musculature from below. Clean clinical anatomical diagram style."
- Figure 1.2: Anatomy of the female genital tract from the vulva to the ovaries. AI-generated using the prompt: "Create a professional medical diagram titled Female Genital Tract Anatomy, showing a coronal view of the vulva, vagina, uterus, fallopian tubes, and ovaries with uterine wall layers and tubal segments labelled. Clean clinical anatomical diagram style."
- Table 1.3: Summary of the vascular and lymphatic drainage of the female genital tract. AI-generated using the prompt: "Create a clean reference table titled Vascular and Lymphatic Drainage of the Female Genital Tract, listing the vulva, vagina, cervix, uterus, and ovaries with their artery, vein, and lymph node group. Simple clinical reference table style with outside border."
- Box 1.4: Summary of common laboratory and imaging investigations in gynaecology. AI-generated using the prompt: "Create a simple single-column reference box with an outside border titled Common Investigations in Gynaecology, listing key tests with a one-line indication for each. Clinical reference box style."
- Figure 1.5: Diagnostic laparoscopy and hysteroscopy in the evaluation of the gynaecological patient. AI-generated using the prompt: "Create a professional medical diagram titled Surgical Evaluation in Gynaecology, showing a laparoscopic pelvic view and a hysteroscope passed into the uterine cavity. Clean clinical surgical diagram style."



Course code: OBG 501

Course title: General Gynaecology

Course credit load: 3 Units

Series 2: History Taking and Examination

- **Part 2.1: Principles and Chronological Order of History Taking**
 - Sub Part 2.1.1: Introduction and presenting complaint
 - Sub Part 2.1.2: History of presenting complaint
 - Sub Part 2.1.3: Menstrual, obstetric, and sexual history
- **Part 2.2: Past Medical, Surgical, and Family History**
 - Sub Part 2.2.1: Past medical and surgical history
 - Sub Part 2.2.2: Drug history and allergies
 - Sub Part 2.2.3: Family and social history
- **Part 2.3: General and Abdominal Examination**
 - Sub Part 2.3.1: General examination
 - Sub Part 2.3.2: Abdominal examination
 - Sub Part 2.3.3: Abdominal palpation for pelvic masses
- **Part 2.4: Pelvic Examination**
 - Sub Part 2.4.1: Inspection and speculum examination
 - Sub Part 2.4.2: Bimanual pelvic examination
 - Sub Part 2.4.3: Rectal and rectovaginal examination
- **Part 2.5: Clinical Reasoning and Differential Diagnosis**
 - Sub Part 2.5.1: Formulating a differential diagnosis from history
 - Sub Part 2.5.2: Correlating examination findings with history
 - Sub Part 2.5.3: Planning initial investigations



Introduction

In the last Series, we explored the anatomy of the pelvis and female genital tract, together with the laboratory, imaging, and surgical methods used to evaluate a gynaecological patient. That anatomical and investigative knowledge means little, however, without the clinical skill to know what to ask, what to look for, and how to bring the two together into a coherent differential diagnosis. This Series turns to precisely that skill: taking a structured gynaecological history, performing a competent and respectful examination, and using both to reason your way towards the most likely diagnosis.

The aim of this Series is to equip you with the knowledge and skill to take a structured gynaecological history, perform a competent general, abdominal, and pelvic examination, and use both to formulate a differential diagnosis and plan appropriate initial investigations.

We shall commence this Series by examining the principles and chronological order of gynaecological history taking, from the presenting complaint through to the menstrual and obstetric history. Next, we will consider past medical, surgical, drug, family, and social history. Following that, our attention turns to general and abdominal examination. We will then explore pelvic examination in detail. Finally, we will conclude by examining clinical reasoning, showing how history and examination findings are brought together to formulate a differential diagnosis and plan initial investigations.

Series Learning Outcomes

Upon completing this Series, you should be able to:

- **SLO 2.1:** explain the chronological order and structure of gynaecological history taking,
- **SLO 2.2:** describe the components of past medical, surgical, drug, family, and social history relevant to gynaecological assessment,
- **SLO 2.3:** demonstrate the technique of general and abdominal examination in a gynaecological patient,
- **SLO 2.4:** demonstrate the technique of pelvic examination,
- **SLO 2.5:** use information from history to formulate a differential diagnosis, and
- **SLO 2.6:** correlate examination findings with history to plan initial investigations.

2.1 Principles and Chronological Order of History Taking

2.1.1 Introduction and presenting complaint



A gynaecological history follows the same broad chronological structure as any clinical history, beginning with the patient's biodata (age, marital status, occupation, and parity, all of which carry particular diagnostic weight in gynaecology), followed by the presenting complaint, recorded as far as possible in the patient's own words, and its duration, establishing the immediate reason for the consultation before further detail is explored.

Establishing rapport at the outset is especially important in gynaecology, given the sensitive and often intimate nature of the symptoms being discussed, and a private, unhurried setting with a clear explanation of what will be asked and why helps the patient feel comfortable disclosing potentially embarrassing or distressing details that are essential to reaching an accurate diagnosis.

Fill in the blank: A gynaecological history begins with the patient's _____ before the presenting complaint is explored. The presenting complaint should be recorded as far as possible in the patient's own _____.

2.1.2 History of presenting complaint

The history of presenting complaint explores each symptom systematically using a structured approach, commonly summarised by the mnemonic SOCRATES for pain (site, onset, character, radiation, associated symptoms, timing, exacerbating and relieving factors, and severity), adapted as needed for non-pain symptoms such as bleeding or discharge, where onset, pattern, quantity, colour, odour, and any associated symptoms are explored in similar systematic detail.

Associated symptoms should be actively sought even when not volunteered, including urinary and bowel symptoms (given the close anatomical relationship between the pelvic organs and the bladder and rectum), and any impact on daily activities, work, and relationships, as the functional and psychosocial impact of gynaecological symptoms is often as clinically relevant as the symptoms themselves.

Fill in the blank: The mnemonic commonly used to systematically explore pain is _____. Urinary and bowel symptoms should be actively sought given their close anatomical relationship to the _____ organs.

2.1.3 Menstrual, obstetric, and sexual history

The menstrual history records the age at menarche, the pattern and regularity of the cycle, cycle length and duration of bleeding, the quantity of flow (often estimated by pad or tampon use), the presence of intermenstrual or postcoital bleeding, and, where relevant, the date of the last menstrual period, all of which together provide crucial information for diagnosing menstrual disorders and calculating gestational age in pregnant patients.

The obstetric history is recorded using the gravida and para system (gravida denoting the total number of pregnancies, para the number of pregnancies reaching viable gestation), with details of each pregnancy's outcome, mode of delivery, and any complications, while the sexual history, taken sensitively and without judgement, covers current sexual activity, contraceptive use, and



relevant risk factors for sexually transmitted infection, all essential context for a complete gynaecological assessment.

Fill in the blank: The obstetric history is recorded using the gravida and _____ system. The age at which menstruation begins is termed _____.

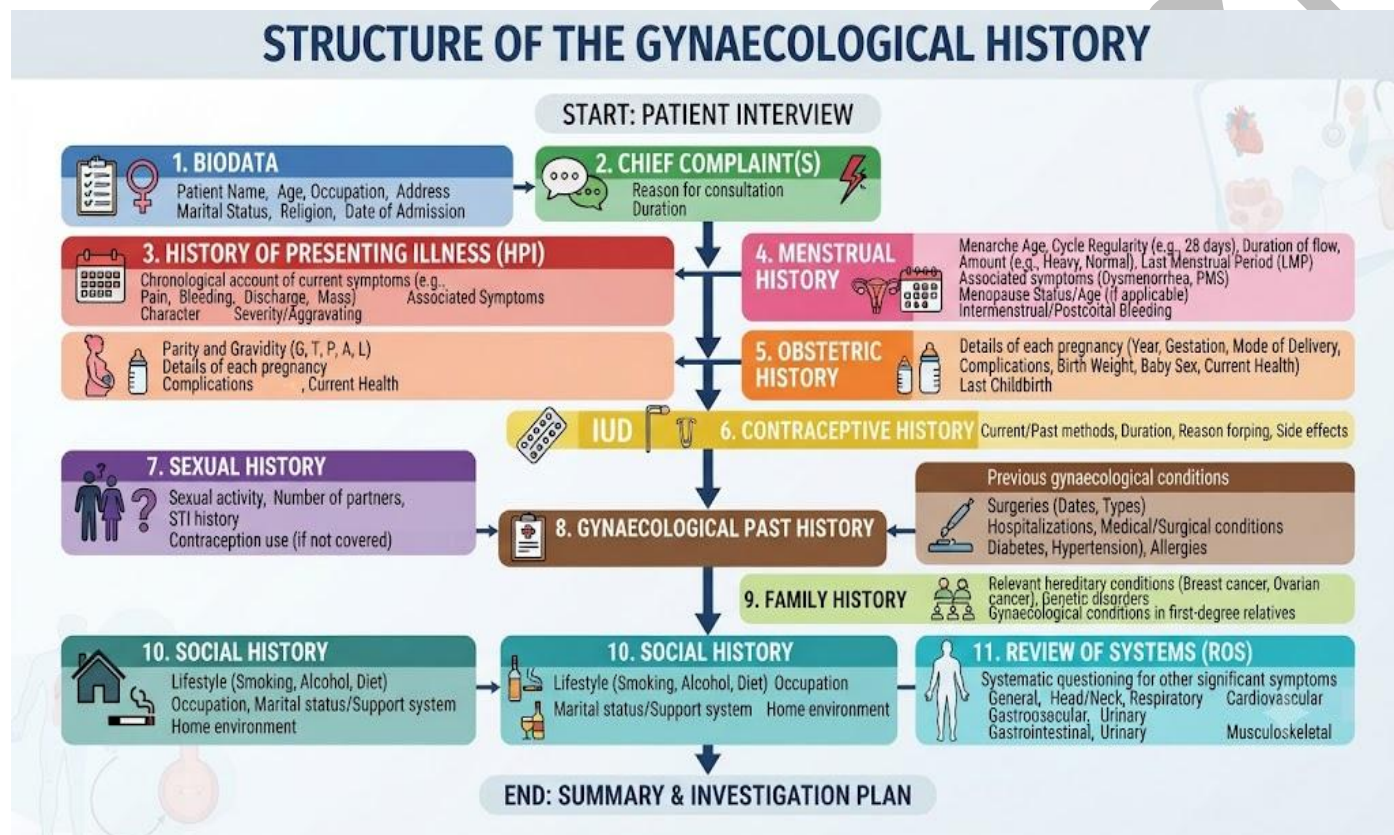


Figure 2.1: Sequential structure of the gynaecological history from biodata to menstrual and obstetric history.

Pilot questions 2.1

- Describe the components of biodata recorded at the start of a gynaecological history. (Linked to SLO 2.1)
- Explain why establishing rapport is especially important in gynaecological history taking. (Linked to SLO 2.1)
- Describe the SOCRATES framework as applied to a gynaecological symptom. (Linked to SLO 2.1)
- Explain why urinary and bowel symptoms should be actively sought in a gynaecological history. (Linked to SLO 2.1)
- Describe the components of the menstrual and obstetric history. (Linked to SLO 2.1)



2.2 Past Medical, Surgical, and Family History

2.2.1 Past medical and surgical history

The past medical history documents chronic conditions relevant to gynaecological assessment and management, including diabetes, hypertension, thromboembolic disease, and any known bleeding disorders, all of which can influence both the differential diagnosis and the safety of proposed investigations, medications, or surgical intervention, making thorough documentation essential rather than a mere formality.

The past surgical history records any previous abdominal or pelvic surgery, including caesarean section, as prior surgery can alter pelvic anatomy, cause adhesions that contribute to chronic pain, and influence the safety and approach of any future surgical intervention, with the specific type and indication for each previous procedure recorded wherever possible rather than a vague description.

Fill in the blank: Documenting chronic conditions such as diabetes and thromboembolic disease can influence the safety of proposed _____. Previous abdominal surgery can cause _____ that contribute to chronic pelvic pain.

2.2.2 Drug history and allergies

The drug history records all current medications, including hormonal contraception and hormone replacement therapy, both of which can directly cause or mask gynaecological symptoms such as abnormal bleeding, and any medications known to interact with proposed treatments, such as anticoagulants relevant to planned surgery or enzyme-inducing drugs relevant to hormonal contraceptive efficacy.

Allergy documentation should specify the precise nature of any reaction (true allergy with features such as rash, swelling, or anaphylaxis, as opposed to simple intolerance), as this distinction has direct implications for the safety of prescribing antibiotics, analgesics, and other medications during subsequent management, and an inaccurate or incomplete allergy history can lead to either unnecessary avoidance of an effective treatment or a genuinely dangerous prescribing error.

Fill in the blank: Hormonal contraception and hormone replacement therapy can directly cause or mask abnormal _____. Allergy documentation should distinguish true allergy from simple _____.

2.2.3 Family and social history

The family history should specifically enquire about gynaecological and breast malignancy, given the recognised hereditary component of ovarian and breast cancer in particular, along with other relevant hereditary conditions such as thromboembolic disease and diabetes, all of which



may influence individual risk assessment and inform decisions around screening or genetic counselling referral where appropriate.

The social history covers occupation, smoking and alcohol use (both relevant to surgical risk and, in the case of smoking, to conditions such as ectopic pregnancy and reduced fertility), and the patient's living and relationship circumstances, all of which provide important context for both diagnosis and the practical planning of subsequent management and follow-up.

Fill in the blank: A family history of ovarian and breast cancer reflects a recognised _____ component that influences individual risk assessment. Smoking is relevant to surgical risk and to conditions such as _____ pregnancy.

Category	Key Elements to Document
<u>Past Medical History</u>	Chronic illnesses (e.g., hypertension, diabetes), infectious diseases, allergies, previous hospitalizations, ongoing medications.
<u>Past Surgical History</u>	Previous operations, indications for surgery, complications, anaesthetic history, blood transfusions.
<u>Family History</u>	Hereditary conditions, familial cancers, cardiovascular disease, diabetes, obstetric/gynaecological disorders, consanguinity.

Table 2.2: Summary of past medical, surgical, drug, family, and social history components.

Pilot questions 2.2

1. Explain why past surgical history is particularly important in gynaecological assessment. (Linked to SLO 2.2)
2. Describe why hormonal medications should be specifically documented in the drug history. (Linked to SLO 2.2)
3. Distinguish true allergy from simple intolerance and explain why this distinction matters. (Linked to SLO 2.2)
4. Explain the relevance of family history of ovarian and breast cancer in gynaecological assessment. (Linked to SLO 2.2)
5. Describe the components of the social history relevant to a gynaecological patient. (Linked to SLO 2.2)

2.3 General and Abdominal Examination

2.3.1 General examination



General examination begins with an overall assessment of the patient's appearance and vital signs (pulse, blood pressure, temperature, and respiratory rate), followed by examination for pallor (suggesting anaemia from heavy menstrual bleeding), jaundice, lymphadenopathy, and signs of hormonal disturbance such as hirsutism or galactorrhoea, all of which can provide important diagnostic clues before the focused pelvic examination begins.

Body mass index should be calculated as part of general examination, as both obesity and being significantly underweight are relevant to menstrual disturbance, fertility, and surgical risk, and thyroid examination should be considered where there is a history suggestive of thyroid dysfunction, given its recognised association with menstrual irregularity and fertility problems.

Fill in the blank: Pallor on general examination may suggest _____ from heavy menstrual bleeding. Both obesity and being significantly underweight are relevant to menstrual disturbance and _____ risk.

2.3.2 Abdominal examination

Abdominal examination follows the standard sequence of inspection, palpation, percussion, and auscultation, with inspection specifically noting any scars from previous surgery, distension, or visible masses, and palpation beginning gently and superficially before proceeding to deeper palpation, always starting away from the area of reported pain to avoid causing unnecessary distress and to allow a more reliable assessment of tenderness.

Percussion helps distinguish a solid pelvic mass (dull to percussion) from ascites (demonstrating shifting dullness) or bowel distension (typically resonant), and auscultation, while less central to gynaecological examination than to general abdominal assessment, may reveal absent or altered bowel sounds suggesting an associated surgical complication requiring urgent further evaluation.

Fill in the blank: Abdominal examination follows the sequence of inspection, palpation, percussion, and _____. Ascites is suggested on percussion by the finding of shifting _____.

2.3.3 Abdominal palpation for pelvic masses

A pelvic mass arising from the abdomen should be assessed for size (in centimetres or, when large, described in relation to gestational uterine size for consistency), consistency (soft, firm, or hard), mobility, tenderness, and whether the examiner can palpate below the mass (a mass palpable from above but not below the umbilicus down to the pelvis is characteristic of an enlarged uterus or ovarian mass arising from the pelvis).

A key distinguishing feature of a pelvic mass is the inability to 'get below' it on abdominal examination, as it arises from the pelvis and is therefore continuous with pelvic structures, unlike an intra-abdominal mass of non-pelvic origin, which can typically be palpated all around; this distinction guides the differential diagnosis and the choice of further imaging to characterise the mass.



Fill in the blank: A pelvic mass characteristically cannot be palpated from _____ on abdominal examination. Large pelvic masses are often described in relation to _____ uterine size for consistency.

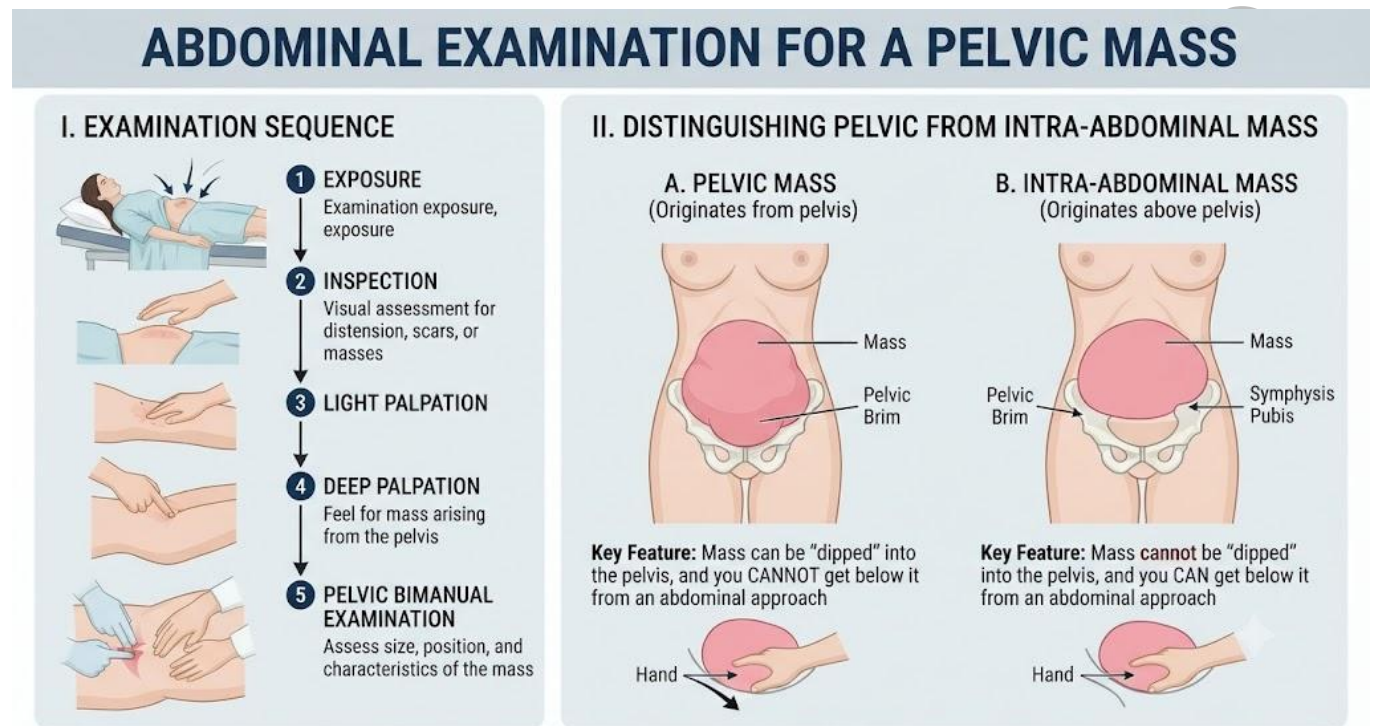


Figure 2.3: Sequence of abdominal examination and the key feature distinguishing a pelvic from an intra-abdominal mass.

Pilot questions 2.3

1. Describe the components of general examination relevant to a gynaecological patient. (Linked to SLO 2.3)
2. Explain the clinical relevance of body mass index in gynaecological assessment. (Linked to SLO 2.3)
3. Describe the standard sequence of abdominal examination. (Linked to SLO 2.3)
4. Explain how percussion helps distinguish a solid mass, ascites, and bowel distension. (Linked to SLO 2.3)
5. Describe the features used to assess a pelvic mass on abdominal palpation. (Linked to SLO 2.3)

2.4 Pelvic Examination



2.4.1 Inspection and speculum examination

Pelvic examination begins with informed consent, an explanation of the procedure, a chaperone offered regardless of examiner gender, and appropriate privacy and positioning (typically the dorsal or left lateral position), followed by inspection of the vulva for any lesion, discoloration, discharge, or atrophic change, before proceeding to speculum examination.

Speculum examination (using a bivalve Cusco's or a Sims' speculum, depending on the purpose and position required) allows direct visualisation of the vaginal walls and cervix, assessment of any discharge, and, where indicated, cervical cytology sampling or swab collection, with gentle technique and adequate lubrication essential to minimise discomfort, particularly in patients who are anxious, postmenopausal, or examined for the first time.

Fill in the blank: A chaperone should be offered for pelvic examination regardless of examiner _____. The two main types of speculum used in gynaecological examination are the Cusco's and _____ speculum.

2.4.2 Bimanual pelvic examination

Bimanual examination involves two gloved fingers inserted into the vagina while the other hand palpates the abdomen, allowing assessment of the cervix (position, consistency, and cervical excitation tenderness, a sign suggestive of pelvic inflammatory disease or ectopic pregnancy), and the size, shape, position, mobility, and tenderness of the uterus.

The adnexa (fallopian tubes and ovaries) are assessed for any palpable mass, tenderness, or fullness, though normal ovaries are frequently not palpable, particularly in an obese patient, and any adnexal mass identified should be further characterised by size, mobility, and tenderness, findings that together with the history guide the differential diagnosis and the choice of further imaging.

Fill in the blank: Pain elicited on movement of the cervix during bimanual examination is called cervical _____ tenderness. The fallopian tubes and ovaries are collectively referred to as the _____.

2.4.3 Rectal and rectovaginal examination

Rectal examination is not routine in every gynaecological assessment but is indicated when assessing posterior pelvic pathology, such as suspected rectovaginal endometriosis or a mass in the pouch of Douglas, and in the staging assessment of cervical or other pelvic malignancy, where it provides information about parametrial and rectal wall involvement not always accessible on vaginal examination alone.

Rectovaginal examination (with one finger in the vagina and one in the rectum simultaneously) allows more precise assessment of the rectovaginal septum, uterosacral ligaments, and pouch of Douglas than either examination performed alone, and is of particular value in the assessment of



suspected deep infiltrating endometriosis, where nodularity or tenderness in this region is a characteristic finding.

Fill in the blank: Rectal examination is particularly indicated in the assessment of suspected rectovaginal _____. Rectovaginal examination is of particular value in assessing deep infiltrating _____.

Step	Key Action
Consent and Chaperone	Obtain informed consent and ensure presence of a chaperone.
Preparation	Explain procedure, ensure privacy, position patient appropriately.
Inspection	Visual examination of external genitalia for lesions, discharge, or abnormalities.
Speculum Examination	Insert speculum to inspect vagina and cervix, collect swabs if indicated.
Bimanual Examination	Assess uterus size, position, adnexal masses, and tenderness.
Rectal Examination	Performed when indicated to evaluate posterior pelvic structures.

Box 2.4: Correct sequence and key steps of pelvic examination.

Pilot questions 2.4

1. Describe the essential preliminary steps before beginning a pelvic examination. (Linked to SLO 2.4)
2. Compare the Cusco's and Sims' speculum and their indications. (Linked to SLO 2.4)
3. Describe the technique and findings assessed on bimanual pelvic examination. (Linked to SLO 2.4)
4. Explain the significance of cervical excitation tenderness. (Linked to SLO 2.4)
5. Describe the indications for rectal and rectovaginal examination. (Linked to SLO 2.4)

2.5 Clinical Reasoning and Differential Diagnosis

2.5.1 Formulating a differential diagnosis from history

A **structured approach** to formulating a differential diagnosis begins with identifying the key presenting symptom or symptom cluster, then systematically considering the possible causes across each relevant anatomical structure and pathological category (congenital, infective,



inflammatory, neoplastic, hormonal, and traumatic), rather than jumping prematurely to the most obvious or most recently encountered diagnosis, a common source of diagnostic error.

Age and reproductive status substantially narrow the differential diagnosis in gynaecology, as the likely causes of a given symptom differ considerably between a prepubertal child, a woman of reproductive age, and a postmenopausal woman, making these two pieces of information, obtained early in the history, powerful tools for focusing subsequent questioning and examination on the most probable diagnoses.

Fill in the blank: A structured differential diagnosis considers pathological categories including congenital, infective, inflammatory, neoplastic, hormonal, and _____. Age and reproductive status substantially narrow the differential diagnosis by focusing on the most _____ diagnoses.

2.5.2 Correlating examination findings with history

Examination findings should always be interpreted in the context of the history rather than in isolation, as the same finding, such as a pelvic mass, carries a very different differential diagnosis in an asymptomatic young woman found incidentally compared with a postmenopausal woman with associated weight loss and ascites, illustrating why examination can never substitute for, but only supplement, a thorough history.

Discrepancies between the history and examination findings, such as reported severe pain without corresponding tenderness, or a normal examination despite a highly suggestive history, should prompt careful reconsideration rather than premature reassurance, as such discrepancies may reflect an early-stage condition not yet detectable on examination, or occasionally indicate a non-organic contributing factor requiring a broader, more holistic assessment.

Fill in the blank: The differential diagnosis for a pelvic mass differs substantially between an asymptomatic young woman and a _____ woman with weight loss and ascites. A discrepancy between history and examination findings should prompt careful _____ rather than premature reassurance.

2.5.3 Planning initial investigations

Initial investigations should be selected purposefully to help distinguish between the leading differential diagnoses identified from history and examination, rather than requested as a routine, undirected panel, with the specific choice of laboratory tests, imaging, or further procedures guided directly by the working differential diagnosis established at the end of the clinical assessment.

A clear, prioritised differential diagnosis also helps determine the urgency of investigation, distinguishing conditions that can be safely investigated in the outpatient setting from those, such as suspected ectopic pregnancy or ovarian torsion, that require urgent same-day assessment, underscoring why the entire process of history, examination, and differential diagnosis formulation exists ultimately to guide safe, timely, and appropriately targeted clinical action.



Fill in the blank: Initial investigations should be selected purposefully to distinguish between the leading _____ diagnoses. Suspected ectopic pregnancy or ovarian torsion requires _____ same-day assessment.

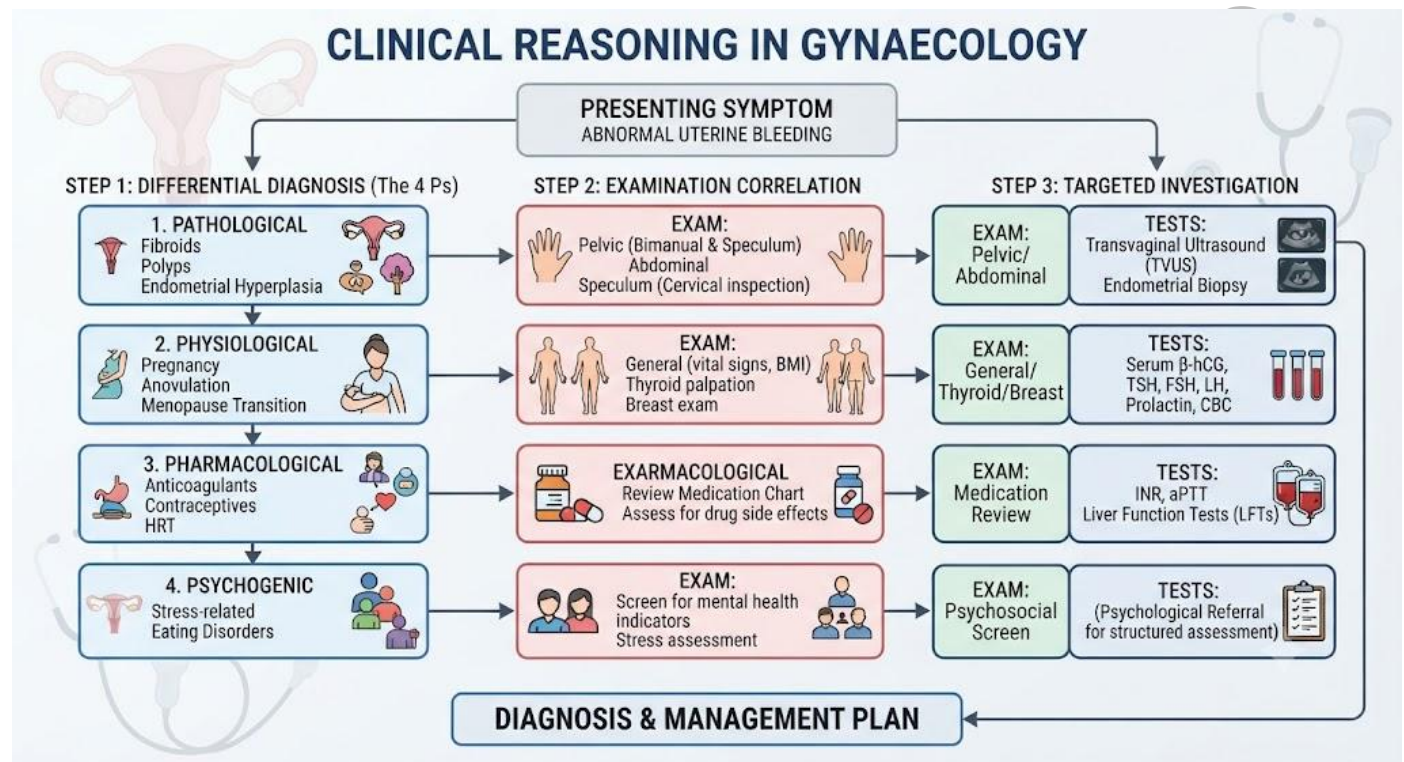


Figure 2.5: The process of clinical reasoning from presenting symptom to targeted investigation.

Pilot questions 2.5

- Describe a structured approach to formulating a differential diagnosis from history. (Linked to SLO 2.5)
- Explain why age and reproductive status are powerful tools in narrowing the differential diagnosis. (Linked to SLO 2.5)
- Explain why examination findings should be interpreted in the context of the history. (Linked to SLO 2.6)
- Describe how a discrepancy between history and examination findings should be managed. (Linked to SLO 2.6)
- Explain how the differential diagnosis guides the selection and urgency of initial investigations. (Linked to SLO 2.6)



Series Summary

This Series has covered the principles and chronological order of gynaecological history taking, from the presenting complaint through to menstrual and obstetric history, followed by past medical, surgical, drug, family, and social history. It went on to examine general, abdominal, and pelvic examination technique in detail, before concluding with clinical reasoning, showing how history and examination findings are correlated to formulate a differential diagnosis and plan appropriately targeted initial investigations.

You should now be able to explain the chronological order of gynaecological history taking, describe the components of past medical, surgical, and social history, demonstrate the technique of general, abdominal, and pelvic examination, and use history and examination findings together to formulate a differential diagnosis and plan initial investigations (Linked to SLOs 2.1 to 2.6).

Glossary of Terms

1. **Bimanual examination:** a pelvic examination technique using two gloved fingers in the vagina and the other hand on the abdomen to assess the uterus and adnexa.
2. **Cervical excitation tenderness:** pain elicited on movement of the cervix during bimanual examination, suggestive of pelvic inflammatory disease or ectopic pregnancy.
3. **Chaperone:** an independent observer offered to a patient during an intimate examination, regardless of examiner gender.
4. **Gravida and para:** a system recording the total number of pregnancies (gravida) and the number reaching viable gestation (para).
5. **Menarche:** the age at which menstruation begins.
6. **Rectovaginal examination:** an examination technique with one finger in the vagina and one in the rectum, used to assess the rectovaginal septum and pouch of Douglas.
7. **SOCRATES:** a mnemonic for systematically exploring pain: site, onset, character, radiation, associated symptoms, timing, exacerbating and relieving factors, and severity.
8. **Speculum examination:** direct visualisation of the vaginal walls and cervix using a Cusco's or Sims' speculum.
9. **Adnexa:** the fallopian tubes and ovaries, collectively, as assessed on bimanual pelvic examination.



10. **Differential diagnosis:** a structured list of possible diagnoses considered on the basis of a patient's history and examination findings.
11. **Pouch of Douglas:** the rectouterine pouch, the most dependent part of the female pelvic cavity, assessable on rectal or rectovaginal examination.
12. **Presenting complaint:** the symptom or symptoms that prompted the patient to seek medical attention, recorded as far as possible in the patient's own words.

Concept Check Questions [Series 2]

Objective questions

- The presenting complaint should be recorded as far as possible in the patient's own _____.
- The mnemonic commonly used to systematically explore pain is _____.
- The obstetric history is recorded using the gravida and _____ system.
- A chaperone should be offered for pelvic examination regardless of examiner _____.
- Pain elicited on movement of the cervix during bimanual examination is called cervical _____ tenderness.

Short-answer questions

1. Explain why establishing rapport is especially important in gynaecological history taking. (Linked to SLO 2.1)
2. Distinguish true allergy from simple intolerance and explain why this distinction matters. (Linked to SLO 2.2)
3. Explain how percussion helps distinguish a solid mass, ascites, and bowel distension. (Linked to SLO 2.3)
4. Describe the indications for rectal and rectovaginal examination. (Linked to SLO 2.4)
5. Explain why age and reproductive status are powerful tools in narrowing the differential diagnosis. (Linked to SLO 2.5)



Long-answer questions

6. Describe the chronological structure of a gynaecological history. (Linked to SLO 2.1)
7. Describe the components of past medical, surgical, drug, family, and social history relevant to gynaecological assessment. (Linked to SLO 2.2)
8. Describe the technique of general and abdominal examination in a gynaecological patient. (Linked to SLO 2.3)
9. Describe the technique of pelvic examination, including inspection, speculum, and bimanual examination. (Linked to SLO 2.4)
10. Describe how history and examination findings are correlated to formulate a differential diagnosis and plan investigation. (Linked to SLO 2.5, SLO 2.6)

Answers to Concept Check Questions [Series 2]

Objective questions

11. Words.
12. SOCRATES.
13. Para.
14. Gender.
15. Excitation.

Short-answer questions

16. The sensitive, intimate nature of gynaecological symptoms means patients may find them embarrassing to discuss, so a private, unhurried, respectful approach helps ensure accurate disclosure.
17. True allergy involves features such as rash, swelling, or anaphylaxis, while intolerance does not. This distinction affects whether a medication can be safely prescribed.
18. A solid mass is dull to percussion, ascites shows shifting dullness, and bowel distension is typically resonant, helping distinguish their underlying cause.



19. Suspected rectovaginal endometriosis, a mass in the pouch of Douglas, and staging assessment of cervical or other pelvic malignancy.
20. The likely causes of a given symptom differ considerably between a prepubertal child, a reproductive-age woman, and a postmenopausal woman, focusing subsequent assessment.

Long-answer questions

21. **Basic response:** A gynaecological history begins with biodata and presenting complaint, followed by history of presenting complaint using a structured framework such as SOCRATES, then menstrual and obstetric history.

Value-added response: Establishing rapport and a private, unhurried setting is especially important given the sensitive nature of gynaecological symptoms, helping ensure accurate disclosure.

22. **Basic response:** Past medical, surgical, drug, and allergy history should be documented, alongside family history of malignancy and relevant social factors such as smoking.

Value-added response: Hormonal medications should be specifically documented as they can cause or mask abnormal bleeding, and allergy history should distinguish true allergy from intolerance.

23. **Basic response:** General examination assesses vital signs and signs of anaemia or hormonal disturbance, while abdominal examination follows inspection, palpation, percussion, and auscultation.

Value-added response: A pelvic mass characteristically cannot be palpated from below on abdominal examination, distinguishing it from an intra-abdominal mass of non-pelvic origin.

24. **Basic response:** Pelvic examination begins with consent and chaperone, followed by inspection, speculum examination, and bimanual examination of the uterus and adnexa.

Value-added response: Rectal and rectovaginal examination are reserved for assessing posterior pelvic pathology such as deep infiltrating endometriosis or malignancy staging.

25. **Basic response:** A structured differential diagnosis considers pathological categories systematically, narrowed by age and reproductive status obtained early in the history.

Value-added response: Examination findings should be interpreted in the context of the history, and any discrepancy should prompt careful reconsideration rather than premature reassurance.



Answers to Pilot Questions [Series 2]

Part 2.1

1. Age, marital status, occupation, and parity, all carrying particular diagnostic weight in gynaecology.
2. The sensitive, intimate nature of gynaecological symptoms means a comfortable, private setting helps ensure accurate disclosure.
3. Site, onset, character, radiation, associated symptoms, timing, exacerbating and relieving factors, and severity.
4. The pelvic organs have a close anatomical relationship to the bladder and rectum, so symptoms may overlap or coexist.
5. Menstrual history covers menarche, cycle pattern and length, flow quantity, and intermenstrual bleeding; obstetric history uses the gravida and para system.

Part 2.2

6. Prior surgery can alter pelvic anatomy, cause adhesions contributing to chronic pain, and influence the safety of future surgery.
7. Hormonal medications can directly cause or mask abnormal bleeding, an important gynaecological symptom.
8. True allergy involves rash, swelling, or anaphylaxis, unlike intolerance; the distinction affects safe prescribing decisions.
9. Ovarian and breast cancer have a recognised hereditary component, influencing risk assessment and screening or genetic counselling decisions.
10. Occupation, smoking and alcohol use, and living and relationship circumstances, relevant to surgical risk and management planning.

Part 2.3

11. Vital signs, assessment for pallor, jaundice, lymphadenopathy, and signs of hormonal disturbance such as hirsutism or galactorrhoea.



12. Both obesity and being underweight are relevant to menstrual disturbance, fertility, and surgical risk.
13. Inspection, palpation, percussion, and auscultation, starting away from the area of reported pain.
14. A solid mass is dull to percussion, ascites shows shifting dullness, and bowel distension is typically resonant.
15. Size, consistency, mobility, tenderness, and whether the examiner can palpate below the mass.

Part 2.4

1. Informed consent, explanation of the procedure, offering a chaperone, and ensuring privacy and appropriate positioning.
2. Cusco's speculum is bivalve and commonly used for general visualisation; Sims' speculum suits lateral positioning and specific clinical situations.
3. Two gloved fingers assess the cervix and uterus for position, size, consistency, mobility, and tenderness, while the other hand palpates the abdomen.
4. It suggests pelvic inflammatory disease or ectopic pregnancy, both important differentials for pelvic pain.
5. Suspected rectovaginal endometriosis, a mass in the pouch of Douglas, and staging assessment of pelvic malignancy.

Part 2.5

1. Identify the key symptom, then systematically consider causes across each pathological category rather than jumping to the most obvious diagnosis.
2. The likely causes of a symptom differ considerably by life stage, focusing subsequent questioning and examination on the most probable diagnoses.
3. The same finding carries a different differential diagnosis depending on the patient's history, so examination alone cannot substitute for a thorough history.
4. A discrepancy should prompt careful reconsideration, as it may reflect an early-stage condition or a non-organic contributing factor.



- Investigations are selected to distinguish the leading differentials, with urgency guided by the possibility of conditions requiring same-day assessment.

References and Attributions [Series 2]

Textual References

- Hoffman, B. L., Schorge, J. O., Halvorson, L. M. et al. (2020). Williams Gynecology (4th ed.). McGraw Hill.
- Berek, J. S. and Berek, D. L. (2019). Berek and Novak's Gynecology (16th ed.). Wolters Kluwer.
- Talley, N. J. and O'Connor, S. (2017). Clinical Examination: A Systematic Guide to Physical Diagnosis (8th ed.). Elsevier.
- Royal College of Obstetricians and Gynaecologists (2022). Gynaecological Examination: Guidance for Clinicians. RCOG Press.

Figures, Plates, Tables, and Boxes

- Figure 2.1: Sequential structure of the gynaecological history from biodata to menstrual and obstetric history. AI-generated using the prompt: "Create a professional medical flowchart titled Structure of the Gynaecological History, showing the sequential flow of history taking from biodata to menstrual and obstetric history. Clean clinical educational diagram style."
- Table 2.2: Summary of past medical, surgical, drug, family, and social history components. AI-generated using the prompt: "Create a clean reference table titled Components of Past Medical, Surgical, and Family History, listing key elements to document under each heading. Simple clinical reference table style with outside border."
- Figure 2.3: Sequence of abdominal examination and the key feature distinguishing a pelvic from an intra-abdominal mass. AI-generated using the prompt: "Create a professional medical diagram titled Abdominal Examination for a Pelvic Mass, showing the examination sequence and distinguishing a pelvic from an intra-abdominal mass. Clean clinical educational diagram style."
- Box 2.4: Correct sequence and key steps of pelvic examination. AI-generated using the prompt: "Create a simple single-column reference box with an outside border titled



Sequence of Pelvic Examination, listing the correct steps from consent through to rectal examination. Clinical reference box style."

5. Figure 2.5: The process of clinical reasoning from presenting symptom to targeted investigation. AI-generated using the prompt: "Create a professional medical flowchart titled Clinical Reasoning in Gynaecology, showing the process from presenting symptom through differential diagnosis, examination correlation, and targeted investigation. Clean clinical educational diagram style."



Course code: OBG 501

Course title: General Gynaecology

Course credit load: 3 Units

Series 3: Pregnancy Physiology and Antenatal Care

- **Part 3.1: Cardiovascular, Respiratory, and Haematological Changes in Pregnancy**
 - Sub Part 3.1.1: Cardiovascular changes in pregnancy
 - Sub Part 3.1.2: Respiratory changes in pregnancy
 - Sub Part 3.1.3: Haematological changes in pregnancy
- **Part 3.2: Renal, Gastrointestinal, and Endocrine Changes in Pregnancy**
 - Sub Part 3.2.1: Renal and urinary tract changes
 - Sub Part 3.2.2: Gastrointestinal changes
 - Sub Part 3.2.3: Endocrine and metabolic changes
- **Part 3.3: Principles and Components of Antenatal Care**
 - Sub Part 3.3.1: Concept and goals of antenatal care
 - Sub Part 3.3.2: Booking visit and schedule of antenatal visits
 - Sub Part 3.3.3: Components of routine antenatal care
- **Part 3.4: Antenatal Investigations and Quality of Care**
 - Sub Part 3.4.1: Routine antenatal investigations
 - Sub Part 3.4.2: Screening and diagnostic tests in pregnancy
 - Sub Part 3.4.3: Quality antenatal care and pregnancy outcomes
- **Part 3.5: Maternal Mortality in Nigeria**
 - Sub Part 3.5.1: Maternal mortality rate and ratio
 - Sub Part 3.5.2: Causes of maternal mortality
 - Sub Part 3.5.3: Prevention of maternal mortality in Nigeria



Introduction

In the last Series, we explored history taking, examination, and clinical reasoning, the practical skills underpinning every gynaecological consultation. We now turn to pregnancy itself, first understanding how thoroughly the maternal body is transformed to support fetal growth and development, and then examining the antenatal care system designed to safeguard both mother and baby through this transformation. We close this Series with one of the most sobering realities of obstetric practice in Nigeria: maternal mortality, its scale, its causes, and, most importantly, how it can be prevented.

The aim of this Series is to equip you with an understanding of the physiological changes of pregnancy, the principles and components of antenatal care, and the causes and prevention of maternal mortality in Nigeria.

We shall commence this Series by examining the cardiovascular, respiratory, and haematological changes of pregnancy. Next, we will consider the renal, gastrointestinal, and endocrine changes. Following that, our attention turns to the principles and components of antenatal care. We will then explore antenatal investigations and the relationship between quality of care and pregnancy outcomes. Finally, we will conclude by examining maternal mortality in Nigeria, its measurement, its causes, and its prevention.

Series Learning Outcomes

Upon completing this Series, you should be able to:

- **SLO 3.1:** enumerate the cardiovascular, respiratory, and haematological physiological changes in pregnancy,
- **SLO 3.2:** enumerate the renal and gastrointestinal physiological changes in pregnancy,
- **SLO 3.3:** discuss how endocrine and metabolic changes in pregnancy affect maternal and fetal wellbeing,
- **SLO 3.4:** explain the concept and components of antenatal care,
- **SLO 3.5:** discuss why various investigations are carried out on pregnant women during antenatal care,
- **SLO 3.6:** elucidate how quality antenatal care leads to good pregnancy outcomes,
- **SLO 3.7:** discuss the maternal mortality rate and ratio in different parts of Nigeria, and



- **SLO 3.8:** enumerate the causes of maternal mortality and explain its prevention in Nigeria.

3.1 Cardiovascular, Respiratory, and Haematological Changes in Pregnancy

3.1.1 Cardiovascular changes in pregnancy

Cardiac output rises by approximately 30 to 50 percent during pregnancy, driven by an increase in both stroke volume and heart rate, beginning early in the first trimester and peaking around 28 to 32 weeks, changes that meet the increased metabolic demands of the growing fetus and placenta but which also mean that women with pre-existing cardiac disease may decompensate as pregnancy advances, particularly around this peak.

Systemic vascular resistance falls under the influence of progesterone and prostaglandins, causing a physiological reduction in blood pressure that reaches its lowest point in the second trimester before gradually returning towards pre-pregnancy levels by term, a pattern important to recognise, as failure of blood pressure to fall as expected, or its later rise above normal limits, can be an early clue to the development of pre-eclampsia.

Fill in the blank: Cardiac output rises by approximately 30 to 50 percent, peaking around _____ weeks of gestation. Blood pressure reaches its lowest point in the _____ trimester before rising again towards term.

3.1.2 Respiratory changes in pregnancy

Progesterone acts as a respiratory stimulant in pregnancy, increasing tidal volume and minute ventilation, producing a state of mild chronic hyperventilation and a corresponding fall in maternal arterial carbon dioxide tension, a physiological adaptation that facilitates the diffusion gradient favouring transfer of carbon dioxide from the fetus to the mother across the placenta.

The enlarging uterus elevates the diaphragm by up to four centimetres by term, reducing functional residual capacity, though this is substantially compensated by an increase in chest wall diameter and diaphragmatic excursion, so that vital capacity is largely preserved despite the mechanical restriction, explaining why healthy pregnant women generally tolerate exertion well despite feeling more breathless than before pregnancy.

Fill in the blank: Progesterone causes a state of mild chronic _____ in pregnancy, lowering maternal carbon dioxide tension. The enlarging uterus elevates the _____ by up to four centimetres by term.

3.1.3 Haematological changes in pregnancy

Plasma volume increases substantially more than red cell mass during pregnancy, producing a relative or physiological anaemia (the dilutional effect commonly termed physiological anaemia



of pregnancy), which must be distinguished from true iron deficiency anaemia, a distinction of considerable practical importance given how frequently both coexist in Nigerian antenatal populations, where dietary iron intake is often marginal.

Pregnancy is also a hypercoagulable state, with increases in several clotting factors and a reduction in fibrinolytic activity, an evolutionary adaptation that reduces the risk of catastrophic haemorrhage at delivery but which also substantially increases the risk of venous thromboembolism throughout pregnancy and, particularly, in the postpartum period, a risk further elevated by any coexisting risk factor such as obesity or immobility.

Fill in the blank: The dilutional fall in haemoglobin concentration from disproportionate plasma volume expansion is termed physiological _____ of pregnancy. Pregnancy is a hypercoagulable state that increases the risk of venous _____.

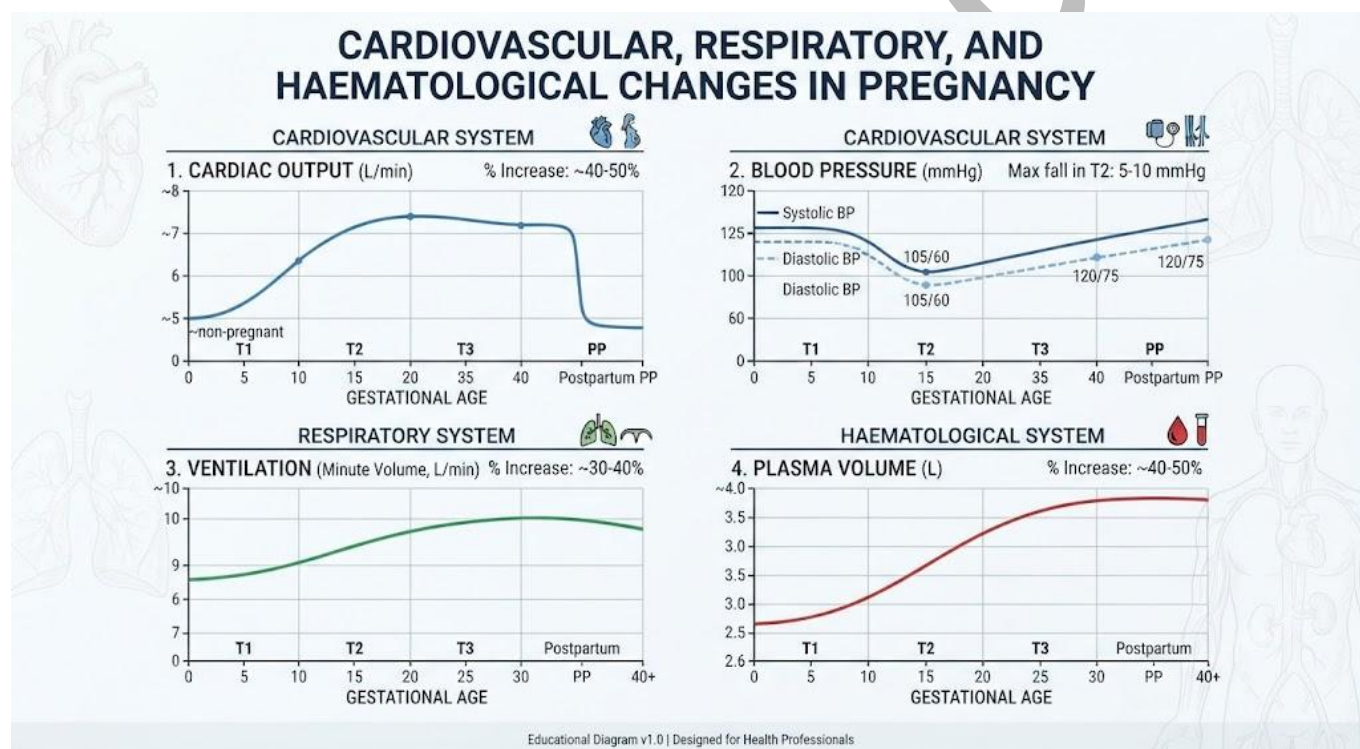


Figure 3.1: Trends in cardiovascular, respiratory, and haematological parameters across gestation.

Pilot questions 3.1

- Describe the changes in cardiac output during pregnancy and their timing. (Linked to SLO 3.1)
- Explain why blood pressure falls in the second trimester of pregnancy. (Linked to SLO 3.1)
- Describe the respiratory changes that occur in pregnancy. (Linked to SLO 3.1)



- Distinguish physiological anaemia of pregnancy from true iron deficiency anaemia. (Linked to SLO 3.1)
- Explain why pregnancy is considered a hypercoagulable state. (Linked to SLO 3.1)

3.2 Renal, Gastrointestinal, and Endocrine Changes in Pregnancy

3.2.1 Renal and urinary tract changes

Renal plasma flow and glomerular filtration rate both increase substantially in pregnancy, from early gestation onwards, causing a fall in serum creatinine and urea below the non-pregnant reference range, an important point to remember when interpreting renal function tests in pregnancy, as a creatinine value considered normal outside pregnancy may in fact represent significant renal impairment in a pregnant woman.

The renal pelvis and ureters dilate under the combined influence of progesterone-mediated smooth muscle relaxation and mechanical compression by the enlarging uterus, more marked on the right side due to dextrorotation of the uterus, a physiological hydronephrosis of pregnancy that predisposes to urinary stasis and, consequently, an increased risk of urinary tract infection and pyelonephritis during pregnancy.

Fill in the blank: Serum creatinine and urea both _____ in pregnancy due to increased glomerular filtration rate. Physiological hydronephrosis of pregnancy is typically more marked on the _____ side.

3.2.2 Gastrointestinal changes

Progesterone-mediated smooth muscle relaxation slows gastrointestinal transit throughout pregnancy, contributing to constipation, and relaxes the lower oesophageal sphincter, predisposing to gastro-oesophageal reflux, which is further worsened as the growing uterus displaces and compresses the stomach in later pregnancy, making heartburn one of the most common gastrointestinal complaints reported by pregnant women.

Nausea and vomiting of pregnancy (commonly termed morning sickness, though it may occur at any time of day) affects the majority of pregnant women, typically beginning around six weeks and resolving by 16 to 20 weeks in most cases, thought to relate to rising human chorionic gonadotropin and oestrogen levels, with hyperemesis gravidarum representing the severe end of this spectrum, causing dehydration, electrolyte disturbance, and weight loss requiring active medical management.

Fill in the blank: Relaxation of the lower oesophageal sphincter in pregnancy predisposes to gastro-oesophageal _____. The severe form of pregnancy sickness causing dehydration and weight loss is termed hyperemesis _____.



3.2.3 Endocrine and metabolic changes

The placenta functions as a major endocrine organ, producing human chorionic gonadotropin (maintaining the corpus luteum in early pregnancy), human placental lactogen (promoting maternal insulin resistance to divert glucose towards the fetus), and progressively increasing oestrogen and progesterone, together orchestrating the profound physiological adaptation of pregnancy across virtually every maternal organ system.

Maternal insulin resistance increases progressively through pregnancy, particularly in the second and third trimesters, as a physiological mechanism ensuring adequate glucose supply to the fetus, but in women with limited pancreatic reserve, this same physiological adaptation can unmask or precipitate gestational diabetes mellitus, making universal or risk-based screening for this condition an established part of routine antenatal care.

Fill in the blank: Human placental lactogen promotes maternal insulin _____ to divert glucose towards the fetus. Progressive insulin resistance in pregnancy can unmask or precipitate gestational _____.

System	Physiological Change	Mechanism	Clinical Implication
<u>Renal</u>	Increased glomerular filtration rate (GFR)	Hormonal effects (progesterone, relaxin) → renal vasodilation	Lower serum creatinine and urea; increased risk of glycosuria and UTIs
	Hydronephrosis and hydroureter	Mechanical compression by gravid uterus	Predisposition to urinary stasis and infection
<u>Gastrointestinal</u>	Reduced gastric motility and delayed emptying	Progesterone-induced smooth muscle relaxation	Nausea, vomiting, reflux, constipation
	Increased risk of gallstones	Reduced gallbladder contractility	Biliary colic, cholelithiasis
<u>Endocrine</u>	Increased thyroid-binding globulin and altered thyroid function	Oestrogen stimulation	Mild physiological hyperthyroidism; careful interpretation of thyroid tests
	Insulin resistance	Placental hormones (human placental lactogen, progesterone, cortisol)	Predisposition to gestational diabetes mellitus

Table 3.2: Summary of renal, gastrointestinal, and endocrine changes in pregnancy and their clinical implications.



Pilot questions 3.2

1. Explain why serum creatinine falls in normal pregnancy. (Linked to SLO 3.2)
2. Describe the mechanism and consequence of physiological hydronephrosis of pregnancy. (Linked to SLO 3.2)
3. Describe the gastrointestinal changes that occur in pregnancy. (Linked to SLO 3.2)
4. Describe the hormonal functions of the placenta in pregnancy. (Linked to SLO 3.3)
5. Explain how maternal insulin resistance in pregnancy can unmask gestational diabetes. (Linked to SLO 3.3)

3.3 Principles and Components of Antenatal Care

3.3.1 Concept and goals of antenatal care

Antenatal care is the systematic supervision (examination and advice) given to a woman during pregnancy, aiming to monitor the progress of pregnancy to promote maternal and fetal health, identify and manage risk factors and complications early, prepare the woman and her family for childbirth, and provide health education on nutrition, danger signs, and birth preparedness, all directed towards achieving the best possible outcome for both mother and baby.

The World Health Organization now recommends a minimum of eight antenatal contacts for a positive pregnancy experience, a marked increase from the previously recommended four-visit focused model, reflecting accumulating evidence that more frequent contact reduces perinatal mortality and improves women's overall satisfaction with their care, even though implementing this expanded schedule remains a genuine resource challenge in many Nigerian health facilities.

Fill in the blank: The World Health Organization now recommends a minimum of _____ antenatal contacts for a positive pregnancy experience. Antenatal care aims to identify and manage risk factors and _____ early in pregnancy.

3.3.2 Booking visit and schedule of antenatal visits

The booking visit (ideally before 12 weeks of gestation) is the first, most comprehensive antenatal visit, establishing baseline information through detailed history, examination, and initial investigations, calculating the estimated date of delivery, and identifying risk factors that will determine whether the woman is suitable for routine midwife-led care or requires referral for consultant-led or specialist care throughout the remainder of pregnancy.

Subsequent visits are traditionally scheduled at four-weekly intervals until 28 weeks, two-weekly until 36 weeks, and weekly thereafter until delivery in a low-risk pregnancy, with the frequency increased for women with identified risk factors or complications, an approach that



balances adequate surveillance for early detection of problems against the practical burden of frequent attendance on the woman and the healthcare system.

Fill in the blank: The booking visit should ideally take place before _____ weeks of gestation. In a low-risk pregnancy, visits are traditionally weekly from _____ weeks until delivery.

3.3.3 Components of routine antenatal care

Each routine antenatal visit typically includes measurement of blood pressure (screening for hypertensive disorders of pregnancy), urinalysis (screening for proteinuria and glycosuria), symphysio-fundal height measurement (assessing fetal growth), assessment of fetal movement and heart rate, and review of any new symptoms, together forming a structured, repeatable surveillance process at every contact throughout pregnancy.

Health education delivered throughout antenatal care covers nutrition and iron and folic acid supplementation, danger signs requiring urgent review (such as severe headache, visual disturbance, reduced fetal movement, or vaginal bleeding), birth preparedness and complication readiness planning, and, in the Nigerian context, malaria prevention through intermittent preventive treatment and insecticide-treated bed nets, all integral components of comprehensive antenatal care rather than optional additions.

Fill in the blank: Symphysio-fundal height measurement at each antenatal visit assesses fetal _____. Malaria prevention in Nigerian antenatal care is achieved through intermittent preventive treatment and insecticide-treated _____.

Assessment	Key Focus
Blood Pressure	Detect hypertension, pre-eclampsia, or other cardiovascular risks.
Urinalysis	Screen for proteinuria, glycosuria, and urinary tract infection.
Symphysio-Fundal Height	Monitor fetal growth and assess gestational age progression.
Fetal Movement and Heart Rate	Ensure fetal wellbeing and detect early signs of distress.
Danger Sign Review	Counsel on warning symptoms (bleeding, headache, swelling, reduced fetal movement).

Box 3.3: Components assessed at every routine antenatal visit.

Pilot questions 3.3

1. Explain the concept and goals of antenatal care. (Linked to SLO 3.4)
2. Describe the current WHO recommendation for the number of antenatal contacts. (Linked to SLO 3.4)
3. Describe the purpose and key components of the booking visit. (Linked to SLO 3.4)



4. Describe the traditional schedule of antenatal visits in a low-risk pregnancy. (Linked to SLO 3.4)
5. Describe the components assessed at every routine antenatal visit. (Linked to SLO 3.4)

3.4 Antenatal Investigations and Quality of Care

3.4.1 Routine antenatal investigations

Booking investigations routinely include full blood count (screening for anaemia), blood group and rhesus status (identifying women at risk of rhesus alloimmunisation requiring anti-D prophylaxis), haemoglobin genotype (of particular importance in Nigeria given the high prevalence of sickle cell disease and trait), and screening for infections including HIV, hepatitis B, and syphilis, all performed early to allow timely intervention where a positive result is identified.

Urinalysis and blood glucose are also assessed at booking and repeated through pregnancy as indicated, with glucose tolerance testing performed around 24 to 28 weeks in women with risk factors for, or universal screening protocols for, gestational diabetes, reflecting the importance of timely identification of this condition, which if undiagnosed and unmanaged carries significant risk to both mother and fetus.

Fill in the blank: Haemoglobin genotype testing at booking is of particular importance in Nigeria given the high prevalence of _____ disease. Women found to be rhesus-negative require anti-_____ prophylaxis to prevent alloimmunisation.

3.4.2 Screening and diagnostic tests in pregnancy

Ultrasound scanning is performed at key points in pregnancy: an early dating scan (confirming viability, gestational age, and, where relevant, the number of fetuses), an anomaly scan around 18 to 22 weeks (screening for structural fetal abnormalities), and, where indicated, growth scans in the third trimester to monitor fetal wellbeing in pregnancies identified as at higher risk of growth restriction or other complications.

Further screening and diagnostic tests include combined or quadruple screening for chromosomal abnormality (where available), with invasive diagnostic testing (chorionic villus sampling or amniocentesis) reserved for pregnancies at higher calculated risk, and continued surveillance for pre-eclampsia through blood pressure and urinalysis at every subsequent antenatal contact, given the potentially rapid and serious progression of this condition if unrecognised.

Fill in the blank: The anomaly scan, screening for structural fetal abnormalities, is typically performed around _____ weeks of gestation. Invasive diagnostic testing for chromosomal abnormality includes chorionic villus sampling or _____.



3.4.3 Quality antenatal care and pregnancy outcomes

Quality antenatal care (care that is timely, respectful, evidence-based, and delivered by a skilled provider) is consistently associated with improved pregnancy outcomes, including earlier detection and management of complications such as pre-eclampsia and gestational diabetes, higher rates of skilled birth attendance, and improved neonatal outcomes, making investment in quality, not merely quantity, of antenatal contacts a central public health priority.

Barriers to quality antenatal care in many Nigerian settings include inadequate staffing and equipment, long waiting times that discourage full attendance, financial and geographical access barriers, particularly in rural areas, and gaps in provider training in respectful, evidence-based care, all of which must be addressed alongside simply increasing the recommended number of antenatal visits if genuine improvement in maternal and perinatal outcomes is to be achieved.

Fill in the blank: Quality antenatal care is associated with improved outcomes including earlier detection of pre-eclampsia and gestational _____. Barriers to quality antenatal care in Nigeria include financial and _____ access barriers.

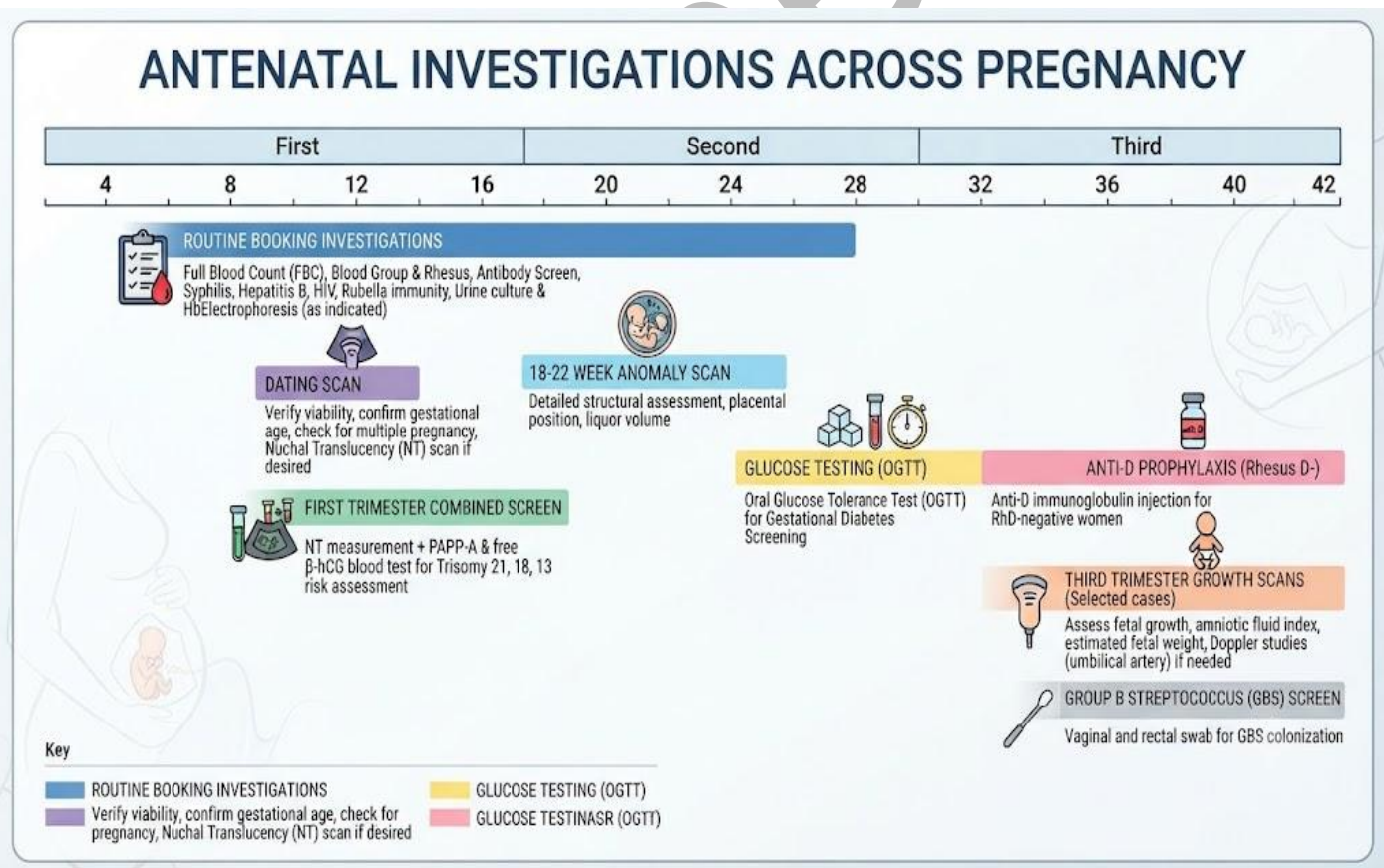


Figure 3.4: Timeline of routine antenatal investigations across gestation.



Pilot questions 3.4

1. Describe the routine investigations performed at the antenatal booking visit. (Linked to SLO 3.5)
2. Explain why haemoglobin genotype testing is particularly important in Nigerian antenatal care. (Linked to SLO 3.5)
3. Describe the purpose of ultrasound scanning at different stages of pregnancy. (Linked to SLO 3.5)
4. Explain how quality antenatal care improves pregnancy outcomes. (Linked to SLO 3.6)
5. Describe the barriers to quality antenatal care in Nigerian settings. (Linked to SLO 3.6)

3.5 Maternal Mortality in Nigeria

3.5.1 Maternal mortality rate and ratio

The maternal mortality ratio (MMR) is defined as the number of maternal deaths per 100,000 live births, distinguishing it from the maternal mortality rate, which expresses maternal deaths relative to the population of women of reproductive age rather than live births, a distinction commonly confused but important for correctly interpreting and comparing published statistics.

Nigeria carries one of the highest maternal mortality burdens in the world, with substantial variation between regions, generally higher in the north than in the south, reflecting differences in access to skilled birth attendance, health facility density, female education, and socioeconomic status, making maternal mortality as much a reflection of broader health system and social determinants as of any single clinical cause.

Fill in the blank: The maternal mortality ratio is defined as the number of maternal deaths per 100,000 _____. Maternal mortality in Nigeria is generally higher in the _____ than in the south.

3.5.2 Causes of maternal mortality

Direct obstetric causes account for the majority of maternal deaths in Nigeria and include postpartum haemorrhage (the leading single cause), hypertensive disorders of pregnancy (pre-eclampsia and eclampsia), sepsis (including that following unsafe abortion), obstructed labour, and complications of unsafe abortion, most of which are preventable with timely access to appropriate emergency obstetric care.

Indirect causes of maternal death arise from pre-existing or coincidental medical conditions aggravated by the physiological demands of pregnancy, including anaemia (itself often multifactorial, related to malaria, poor nutrition, and haemoglobinopathy), malaria, and cardiac



disease, all of which require specific attention during antenatal risk assessment rather than being treated as incidental to the pregnancy itself.

Fill in the blank: The leading single direct cause of maternal death in Nigeria is postpartum _____. Indirect causes of maternal death include anaemia, malaria, and _____ disease.

3.5.3 Prevention of maternal mortality in Nigeria

The three delays model provides a useful framework for understanding preventable maternal death: delay in deciding to seek care (often related to poor recognition of danger signs or financial and social barriers), delay in reaching a health facility (related to distance, transport, and infrastructure), and delay in receiving adequate care once at the facility (related to staffing, equipment, blood, and drug availability), with effective prevention requiring intervention at all three levels simultaneously.

National and community-level strategies to reduce maternal mortality in Nigeria include strengthening emergency obstetric and newborn care services, task-shifting to expand skilled birth attendance, community health insurance and free maternal healthcare schemes to remove financial barriers, improving referral and transport systems, and sustained investment in female education, all recognised as complementary rather than competing approaches to this complex, multifactorial public health challenge.

Fill in the blank: The three delays model describes delay in deciding to seek care, delay in reaching a facility, and delay in receiving adequate _____. Expanding skilled birth attendance through redistributing tasks among health workers is known as task-_____.



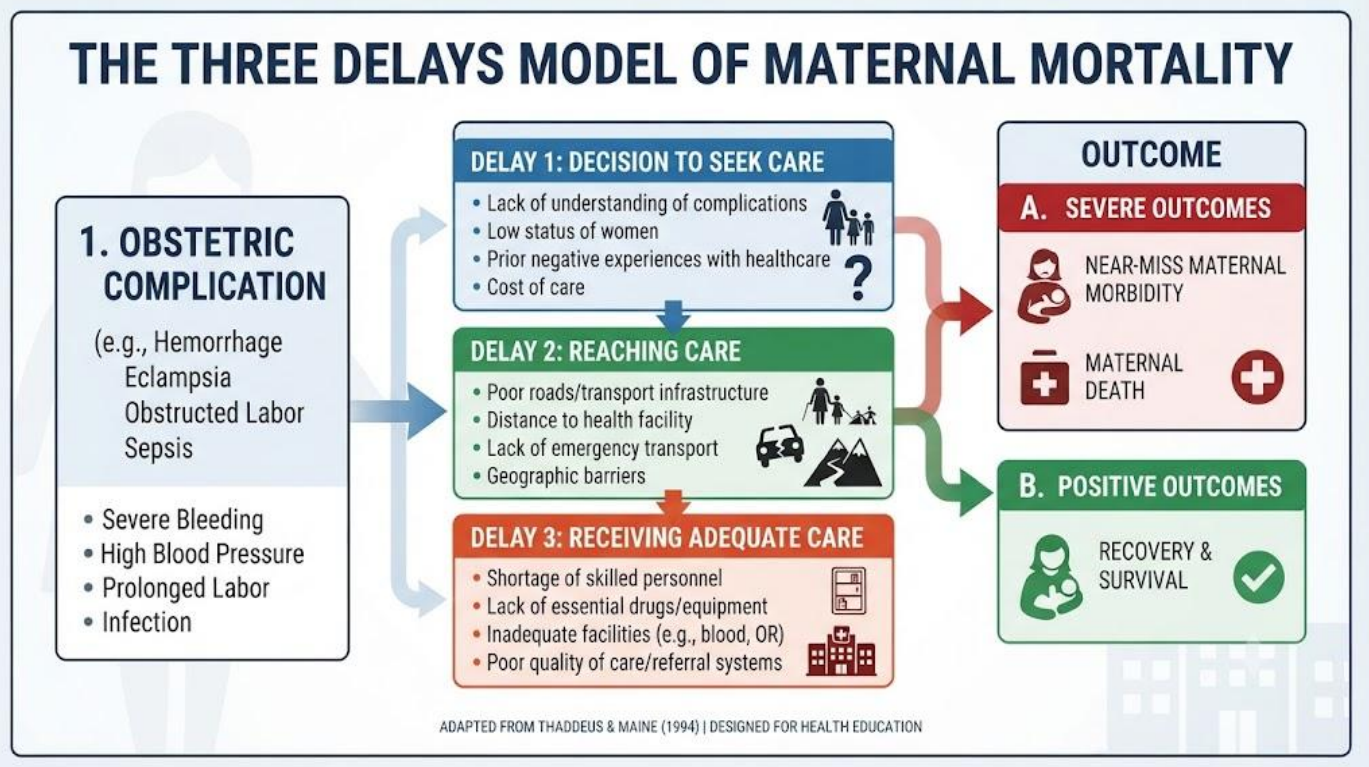


Figure 3.5: The three delays model of preventable maternal mortality.

Pilot questions 3.5

- Distinguish the maternal mortality ratio from the maternal mortality rate. (Linked to SLO 3.7)
- Describe the regional variation in maternal mortality within Nigeria and its likely causes. (Linked to SLO 3.7)
- List the leading direct causes of maternal mortality in Nigeria. (Linked to SLO 3.8)
- Describe the three delays model of preventable maternal death. (Linked to SLO 3.8)
- Describe national and community-level strategies to reduce maternal mortality in Nigeria. (Linked to SLO 3.8)

Series Summary

This Series has covered the cardiovascular, respiratory, and haematological changes of pregnancy, followed by the renal, gastrointestinal, and endocrine changes. It went on to examine



the principles, components, and investigations of antenatal care, and the relationship between quality of care and pregnancy outcomes, before concluding with maternal mortality in Nigeria, its measurement, its leading causes, and evidence-based strategies for its prevention.

You should now be able to enumerate the physiological changes of pregnancy across all major organ systems, explain the concept and components of antenatal care, discuss why antenatal investigations are performed and how quality care improves outcomes, and discuss the causes and prevention of maternal mortality in Nigeria (Linked to SLOs 3.1 to 3.8).

Glossary of Terms

1. **Anti-D prophylaxis:** an injection given to rhesus-negative women to prevent rhesus alloimmunisation.
2. **Booking visit:** the first, most comprehensive antenatal visit, ideally before 12 weeks of gestation.
3. **Gestational diabetes mellitus:** diabetes first identified during pregnancy, related to progressive physiological insulin resistance.
4. **Human placental lactogen:** a placental hormone that promotes maternal insulin resistance to divert glucose towards the fetus.
5. **Hyperemesis gravidarum:** severe nausea and vomiting of pregnancy causing dehydration, electrolyte disturbance, and weight loss.
6. **Maternal mortality ratio (MMR):** the number of maternal deaths per 100,000 live births.
7. **Physiological anaemia of pregnancy:** a dilutional fall in haemoglobin concentration from plasma volume expansion exceeding red cell mass expansion.
8. **Physiological hydronephrosis of pregnancy:** dilatation of the renal pelvis and ureters from progesterone-mediated relaxation and uterine compression.
9. **Symphysio-fundal height:** a measurement from the pubic symphysis to the uterine fundus, used to assess fetal growth at antenatal visits.
10. **Task-shifting:** redistributing healthcare tasks among different categories of health workers to expand access to skilled care.
11. **The three delays model:** a framework describing delay in deciding to seek care, reaching a facility, and receiving adequate care as contributors to preventable maternal death.



12. **Postpartum haemorrhage:** excessive bleeding after childbirth, the leading direct cause of maternal death in Nigeria.

Concept Check Questions [Series 3]

Objective questions

- Cardiac output rises by approximately 30 to 50 percent, peaking around _____ weeks of gestation.
- Physiological hydronephrosis of pregnancy is typically more marked on the _____ side.
- The World Health Organization now recommends a minimum of _____ antenatal contacts for a positive pregnancy experience.
- Women found to be rhesus-negative require anti-_____ prophylaxis to prevent alloimmunisation.
- The maternal mortality ratio is defined as the number of maternal deaths per 100,000 _____.

Short-answer questions

1. Distinguish physiological anaemia of pregnancy from true iron deficiency anaemia. (Linked to SLO 3.1)
2. Describe the gastrointestinal changes that occur in pregnancy. (Linked to SLO 3.2)
3. Describe the purpose and key components of the booking visit. (Linked to SLO 3.4)
4. Explain why haemoglobin genotype testing is particularly important in Nigerian antenatal care. (Linked to SLO 3.5)
5. Describe the three delays model of preventable maternal death. (Linked to SLO 3.8)

Long-answer questions

6. Describe the cardiovascular, respiratory, and haematological changes of pregnancy. (Linked to SLO 3.1)



7. Describe the renal, gastrointestinal, and endocrine changes of pregnancy. (Linked to SLO 3.2, SLO 3.3)
8. Explain the concept, components, and schedule of antenatal care. (Linked to SLO 3.4)
9. Describe the investigations performed during antenatal care and their purpose. (Linked to SLO 3.5, SLO 3.6)
10. Describe the causes of maternal mortality in Nigeria and strategies for its prevention. (Linked to SLO 3.7, SLO 3.8)

Answers to Concept Check Questions [Series 3]

Objective questions

11. 28 to 32.
12. Right.
13. Eight.
14. D.
15. Live births.

Short-answer questions

16. Physiological anaemia results from disproportionate plasma volume expansion, while iron deficiency reflects true reduced iron stores; both frequently coexist and require careful distinction.
17. Slowed gastrointestinal transit causing constipation, relaxed lower oesophageal sphincter causing reflux, and nausea and vomiting, most pronounced in early pregnancy.
18. The booking visit, ideally before 12 weeks, establishes baseline history, examination, and investigations, calculates the estimated date of delivery, and identifies risk factors.
19. Nigeria has a high prevalence of sickle cell disease and trait, making haemoglobin genotype an essential early antenatal screening test.
20. Delay in deciding to seek care, delay in reaching a facility, and delay in receiving adequate care once there, requiring intervention at all three levels.



Long-answer questions

21. **Basic response:** Cardiac output and plasma volume increase substantially in pregnancy, blood pressure falls in the second trimester, and mild hyperventilation and physiological anaemia are expected findings.

Value-added response: Recognising these expected changes is essential, as deviation from the normal pattern, such as failure of blood pressure to fall, can be an early clue to pre-eclampsia.

22. **Basic response:** Renal plasma flow and glomerular filtration rate increase, gastrointestinal transit slows, and the placenta functions as a major endocrine organ driving progressive insulin resistance.

Value-added response: These changes have direct clinical implications, including altered interpretation of renal function tests and the physiological basis for gestational diabetes screening.

23. **Basic response:** Antenatal care is systematic supervision throughout pregnancy, beginning with a comprehensive booking visit and continuing on a schedule determined by risk status.

Value-added response: Investigations at each stage of antenatal care are purposefully timed, from booking bloods to the anomaly scan and glucose tolerance testing, to detect and manage complications early.

24. **Basic response:** Nigeria has one of the highest maternal mortality burdens globally, with postpartum haemorrhage, hypertensive disorders, and sepsis as leading direct causes.

Value-added response: The three delays model and strategies such as task-shifting and improved referral systems together address the multifactorial nature of preventable maternal death.

Answers to Pilot Questions [Series 3]

Part 3.1

1. Cardiac output rises 30 to 50 percent from stroke volume and heart rate increases, peaking around 28 to 32 weeks.



2. Progesterone and prostaglandins reduce systemic vascular resistance, lowering blood pressure to its nadir in the second trimester.
3. Increased tidal volume and minute ventilation from progesterone, mild chronic hyperventilation, and diaphragmatic elevation with preserved vital capacity.
4. Physiological anaemia is dilutional from plasma volume exceeding red cell mass expansion; iron deficiency reflects true reduced iron stores.
5. Increased clotting factors and reduced fibrinolysis reduce delivery haemorrhage risk but increase venous thromboembolism risk.

Part 3.2

6. Increased glomerular filtration rate clears creatinine and urea more efficiently, lowering their serum concentration below non-pregnant norms.
7. Progesterone relaxes ureteric smooth muscle and the enlarging uterus compresses the ureters, predisposing to urinary stasis and infection.
8. Slowed transit causing constipation, relaxed lower oesophageal sphincter causing reflux, and common nausea and vomiting of pregnancy.
9. The placenta produces hCG, human placental lactogen, oestrogen, and progesterone, orchestrating maternal physiological adaptation.
10. Progressive insulin resistance ensures fetal glucose supply but can unmask gestational diabetes in women with limited pancreatic reserve.

Part 3.3

11. Monitoring pregnancy progress, identifying risk factors early, preparing for childbirth, and providing health education for the best maternal and fetal outcome.
12. A minimum of eight antenatal contacts, up from the previous four-visit focused model.
13. Detailed history, examination, initial investigations, calculation of estimated delivery date, and risk stratification for the level of care required.
14. Four-weekly until 28 weeks, two-weekly until 36 weeks, and weekly thereafter until delivery in a low-risk pregnancy.



15. Blood pressure, urinalysis, symphysio-fundal height, fetal movement and heart rate, and review of new symptoms.

Part 3.4

1. Full blood count, blood group and rhesus status, haemoglobin genotype, and screening for HIV, hepatitis B, and syphilis.
2. Nigeria has a high prevalence of sickle cell disease and trait, making genotype testing an essential early screening step.
3. The dating scan confirms viability and gestational age, the anomaly scan screens for structural abnormality, and growth scans monitor fetal wellbeing in higher-risk pregnancies.
4. It enables earlier detection of complications such as pre-eclampsia and gestational diabetes, improving skilled birth attendance and neonatal outcomes.
5. Inadequate staffing and equipment, long waiting times, financial and geographical access barriers, and gaps in provider training.

Part 3.5

1. MMR is deaths per 100,000 live births; maternal mortality rate is deaths relative to the population of women of reproductive age.
2. Mortality is generally higher in the north, reflecting differences in skilled birth attendance, facility density, education, and socioeconomic status.
3. Postpartum haemorrhage, hypertensive disorders of pregnancy, sepsis, obstructed labour, and complications of unsafe abortion.
4. Delay in deciding to seek care, delay in reaching a facility, and delay in receiving adequate care once there.
5. Strengthening emergency obstetric care, task-shifting, financial barrier removal, improved referral systems, and investment in female education.

References and Attributions [Series 3]

Textual References



6. Hoffman, B. L., Schorge, J. O., Halvorson, L. M. et al. (2020). Williams Gynecology (4th ed.). McGraw Hill.
7. Cunningham, F. G., Leveno, K. J., Dashe, J. S. et al. (2022). Williams Obstetrics (26th ed.). McGraw Hill.
8. World Health Organization (2016). WHO Recommendations on Antenatal Care for a Positive Pregnancy Experience. WHO Press.
9. National Population Commission and ICF (2019). Nigeria Demographic and Health Survey 2018. NPC and ICF.

Figures, Plates, Tables, and Boxes

1. Figure 3.1: Trends in cardiovascular, respiratory, and haematological parameters across gestation. AI-generated using the prompt: "Create a professional medical diagram titled Cardiovascular, Respiratory, and Haematological Changes in Pregnancy, showing trend graphs of cardiac output, blood pressure, ventilation, and plasma volume against gestational age. Clean clinical educational diagram style."
2. Table 3.2: Summary of renal, gastrointestinal, and endocrine changes in pregnancy and their clinical implications. AI-generated using the prompt: "Create a clean reference table titled Renal, Gastrointestinal, and Endocrine Changes in Pregnancy, listing each change, its mechanism, and clinical implication. Simple clinical reference table style with outside border."
3. Box 3.3: Components assessed at every routine antenatal visit. AI-generated using the prompt: "Create a simple single-column reference box with an outside border titled Components of Every Routine Antenatal Visit, listing the key assessments performed at each contact. Clinical reference box style."
4. Figure 3.4: Timeline of routine antenatal investigations across gestation. AI-generated using the prompt: "Create a professional medical timeline diagram titled Antenatal Investigations Across Pregnancy, plotting booking investigations, dating scan, anomaly scan, glucose testing, and growth scans against gestational age. Clean clinical educational diagram style."
5. Figure 3.5: The three delays model of preventable maternal mortality. AI-generated using the prompt: "Create a professional medical diagram titled The Three Delays Model of Maternal Mortality, showing the pathway from obstetric complication through the three delays to outcome, with example contributing factors. Clean clinical educational diagram style."



Course code: OBG 501

Course title: General Gynaecology

Course credit load: 3 Units

Series 4: Gynaecological Disorders and Management

- **Part 4.1: Paediatric and Congenital Gynaecology**
 - Sub Part 4.1.1: Congenital anomalies of the female genital tract
 - Sub Part 4.1.2: Intersex disorders (disorders of sexual development)
 - Sub Part 4.1.3: Acquired gynaecological disorders of childhood
- **Part 4.2: Endometriosis, Adenomyosis, and Chronic Pelvic Pain**
 - Sub Part 4.2.1: Endometriosis
 - Sub Part 4.2.2: Adenomyosis
 - Sub Part 4.2.3: Chronic pelvic pain
- **Part 4.3: Genital Tract Injuries and Acquired Gynaetresia**
 - Sub Part 4.3.1: Genital tract injuries
 - Sub Part 4.3.2: Acquired gynaetresia
 - Sub Part 4.3.3: Dilatation and curettage
- **Part 4.4: Abnormal Uterine Bleeding and Ectopic Gestation**
 - Sub Part 4.4.1: Intermenstrual and post-coital bleeding
 - Sub Part 4.4.2: Postmenopausal bleeding
 - Sub Part 4.4.3: Ectopic gestation
- **Part 4.5: Displacements of the Female Genitalia**
 - Sub Part 4.5.1: Uterine prolapse
 - Sub Part 4.5.2: Retroversion and other uterine displacements
 - Sub Part 4.5.3: Management of pelvic organ prolapse



Introduction

In the last Series, we explored the physiological changes of pregnancy and the antenatal care system built around them. We now return to general gynaecology, examining a wide range of disorders spanning the entire reproductive lifespan, from congenital anomalies identified in infancy to prolapse presenting decades later in a postmenopausal woman. This breadth reflects the reality of gynaecological practice, where the same clinic can see a teenager with primary amenorrhoea, a woman in her thirties with endometriosis-related infertility, and a grandmother with a symptomatic vault prolapse, each requiring a distinct but equally thorough clinical approach.

The aim of this Series is to equip you with the knowledge to recognise and manage the common gynaecological disorders spanning childhood through to the postmenopausal years, including endometriosis, abnormal uterine bleeding, ectopic gestation, and pelvic organ prolapse.

We shall commence this Series by examining paediatric and congenital gynaecology, including congenital anomalies and disorders of sexual development. Next, we will consider endometriosis, adenomyosis, and chronic pelvic pain. Following that, our attention turns to genital tract injuries, acquired gynaetresia, and dilatation and curettage. We will then explore abnormal uterine bleeding and ectopic gestation. Finally, we will conclude by examining displacements of the female genitalia, including uterine prolapse and its management.

Series Learning Outcomes

Upon completing this Series, you should be able to:

- **SLO 4.1:** describe the congenital anomalies of the female genital tract and disorders of sexual development,
- **SLO 4.2:** describe the acquired gynaecological disorders of childhood,
- **SLO 4.3:** describe the clinical presentation, diagnosis, and management of endometriosis and adenomyosis,
- **SLO 4.4:** discuss the causes and multidisciplinary management of chronic pelvic pain,
- **SLO 4.5:** describe the causes and presentation of genital tract injuries and acquired gynaetresia,
- **SLO 4.6:** describe the indications for, and risks of, dilatation and curettage,
- **SLO 4.7:** describe the causes, investigation, and management of abnormal uterine bleeding and ectopic gestation, and



- **SLO 4.8:** describe the causes, presentation, and management of displacements of the female genitalia.

4.1 Paediatric and Congenital Gynaecology

4.1.1 Congenital anomalies of the female genital tract

Mullerian duct anomalies result from abnormal development, fusion, or resorption of the paired paramesonephric (Mullerian) ducts during embryogenesis, ranging from Mullerian agenesis (Mayer-Rokitansky-Kuster-Hauser syndrome, absent or rudimentary uterus and upper vagina in a phenotypically normal female with normal ovaries and karyotype) to septate, bicornuate, and didelphic uterus, each carrying differing implications for fertility and obstetric outcome.

Imperforate hymen is the most common congenital obstructive anomaly of the lower genital tract, typically presenting at puberty with cyclical abdominal pain and primary amenorrhoea from accumulated menstrual blood (haematocolpos), palpable as a lower abdominal mass with a bulging, bluish membrane visible at the introitus, managed with surgical incision to allow drainage once diagnosed.

Fill in the blank: Absent or rudimentary uterus with normal ovaries and karyotype is termed _____ syndrome. Accumulated menstrual blood behind an imperforate hymen is called _____.

4.1.2 Intersex disorders (disorders of sexual development)

Disorders of sexual development (DSD) are congenital conditions in which chromosomal, gonadal, or anatomical sex is atypical, broadly classified as 46,XX DSD (most commonly congenital adrenal hyperplasia, causing virilisation of an otherwise chromosomally and gonadally female fetus), 46,XY DSD (including androgen insensitivity syndrome, where a genetically male fetus develops a female phenotype due to end-organ resistance to androgens), and disorders of gonadal development.

Management of DSD requires a specialist multidisciplinary team, including paediatric endocrinology, urology or gynaecology, psychology, and genetics, with decisions around gender assignment, timing of any surgical intervention, and long-term hormonal management approached individually, sensitively, and, wherever possible, with the affected individual's own voice central to decisions as they reach an appropriate age to participate.

Fill in the blank: The most common cause of 46,XX DSD is congenital adrenal _____. In androgen insensitivity syndrome, a genetically _____ fetus develops a female phenotype due to end-organ resistance to androgens.

4.1.3 Acquired gynaecological disorders of childhood



Vulvovaginitis is the most common gynaecological complaint in prepubertal girls, related to the thin, oestrogen-deficient vaginal epithelium and proximity of the anus to the vulva, predisposing to irritation from poor hygiene, non-specific bacterial contamination, or, less commonly, a retained foreign body, which should always be considered in a child with persistent or foul-smelling discharge unresponsive to simple measures.

Precocious puberty (onset of secondary sexual characteristics before age eight) requires prompt referral and investigation to distinguish central (gonadotropin-dependent, most commonly idiopathic but requiring exclusion of an intracranial lesion) from peripheral (gonadotropin-independent, from an ovarian or adrenal source of sex steroid) causes, as the underlying cause determines both the urgency and the specific approach to management.

Fill in the blank: Vulvovaginitis in prepubertal girls is related to the thin, _____-deficient vaginal epithelium. Precocious puberty is defined as onset of secondary sexual characteristics before age _____.

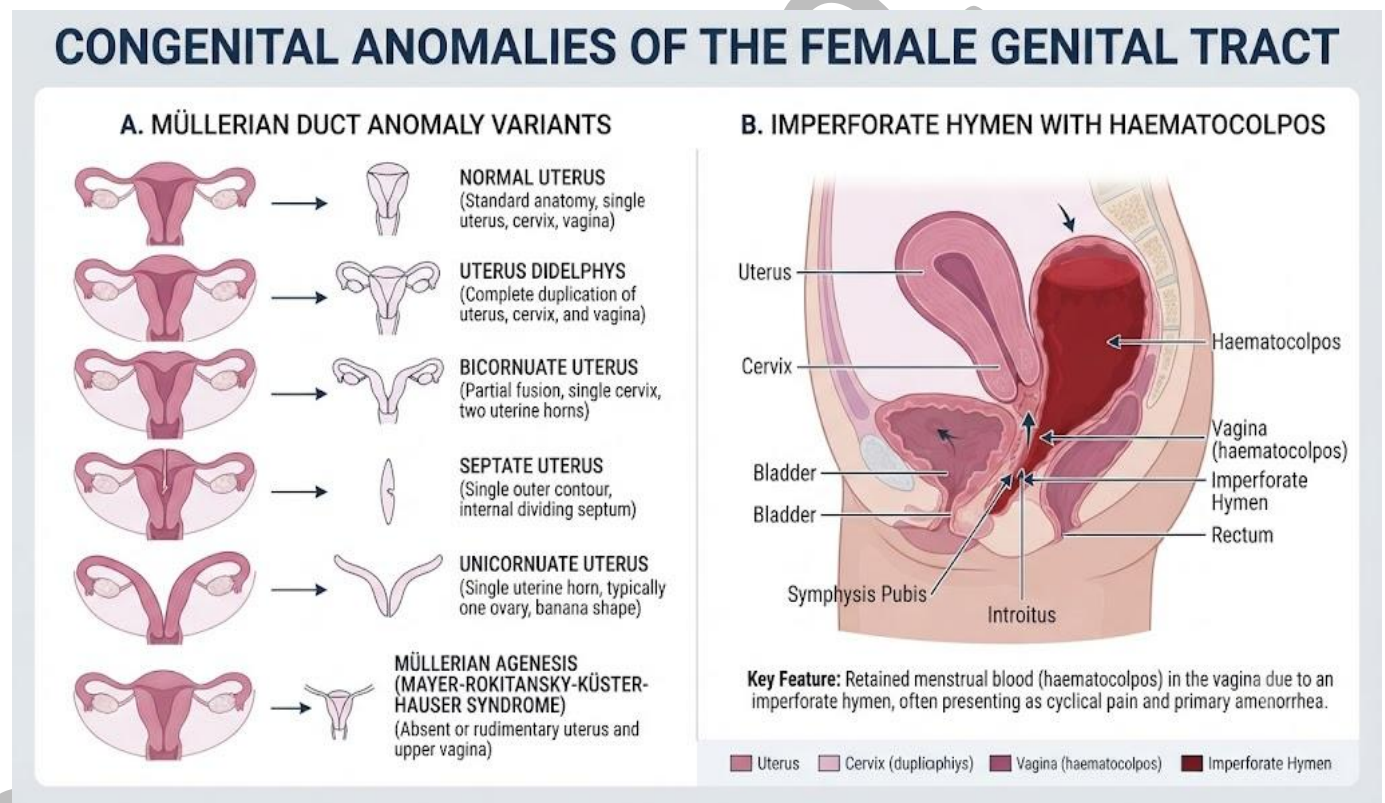


Figure 4.1: Spectrum of Mullerian duct anomalies and imperforate hymen with haematocolpos.

Pilot questions 4.1

- Describe the spectrum of Mullerian duct anomalies. (Linked to SLO 4.1)
- Describe the clinical presentation and management of imperforate hymen. (Linked to SLO 4.1)



- Describe the classification of disorders of sexual development. (Linked to SLO 4.1)
- Describe the most common gynaecological complaint in prepubertal girls and its causes. (Linked to SLO 4.2)
- Distinguish central from peripheral precocious puberty. (Linked to SLO 4.2)

4.2 Endometriosis, Adenomyosis, and Chronic Pelvic Pain

4.2.1 Endometriosis

Endometriosis is the presence of endometrial-like tissue outside the uterine cavity, most commonly affecting the ovaries, pelvic peritoneum, and uterosacral ligaments, presenting with cyclical or chronic pelvic pain, dysmenorrhoea, deep dyspareunia, and, in a significant proportion of affected women, subfertility, with the severity of symptoms often poorly correlated with the extent of disease seen at laparoscopy.

Diagnosis is suggested by history and examination (tenderness or nodularity on rectovaginal examination in deep infiltrating disease) and supported by transvaginal ultrasound or MRI for endometriomas or deep infiltrating disease, but definitive diagnosis requires laparoscopic visualisation with or without histological confirmation, and management ranges from analgesia and hormonal suppression (combined hormonal contraception, progestogens, or GnRH analogues) to surgical excision or ablation of endometriotic deposits.

Fill in the blank: Endometriosis is the presence of endometrial-like tissue _____ the uterine cavity. Definitive diagnosis of endometriosis requires _____ visualisation, with or without histological confirmation.

4.2.2 Adenomyosis

Adenomyosis is the presence of endometrial glands and stroma within the myometrium, causing uterine enlargement and thickening, classically presenting with heavy, painful periods and a diffusely enlarged, tender, boggy uterus on examination, and, unlike endometriosis, most commonly affecting multiparous women in their late reproductive years, though it is increasingly recognised in younger women too.

Diagnosis is suggested by transvaginal ultrasound (showing an enlarged, globular uterus with heterogeneous myometrial texture) or, with greater accuracy, MRI, though definitive diagnosis remains histological, typically only confirmed after hysterectomy, and management for women wishing to preserve fertility or avoid surgery centres on symptomatic control with hormonal treatment or the levonorgestrel intrauterine system, reserving hysterectomy for definitive cure in women who have completed childbearing.



Fill in the blank: Adenomyosis is the presence of endometrial glands and stroma within the _____. Definitive diagnosis of adenomyosis remains _____, typically confirmed only after hysterectomy.

4.2.3 Chronic pelvic pain

Chronic pelvic pain is defined as intermittent or constant pelvic pain lasting six months or longer, not exclusively associated with menstruation or intercourse, arising from a wide range of gynaecological (endometriosis, adenomyosis, adhesions, pelvic inflammatory disease sequelae), gastrointestinal, urological, and musculoskeletal causes, frequently with more than one contributing factor identified in the same patient.

A structured, multidisciplinary approach to assessment, considering all potential systems rather than assuming a purely gynaecological cause, improves diagnostic yield and patient satisfaction, and management similarly often requires a multimodal approach combining analgesia, hormonal treatment where a gynaecological cause is identified, physiotherapy, and psychological support, recognising the substantial impact of chronic pain on quality of life and mental health.

Fill in the blank: Chronic pelvic pain is defined as pain lasting _____ months or longer. Management of chronic pelvic pain often requires a _____ approach addressing multiple contributing factors.

Comparison Point	Endometriosis	Adenomyosis
Typical Patient Profile	Women of reproductive age, often nulliparous	Women in late reproductive age, often multiparous
Presenting Symptoms	Dysmenorrhea, chronic pelvic pain, dyspareunia, infertility	Heavy menstrual bleeding, dysmenorrhea, enlarged tender uterus
Diagnostic Findings	Laparoscopy showing ectopic endometrial implants; imaging may show ovarian endometriomas	Ultrasound/MRI showing diffusely enlarged uterus with heterogeneous myometrium
Management Approach	Medical (NSAIDs, hormonal therapy), surgical excision of lesions, assisted reproduction if needed	Medical (hormonal therapy), hysterectomy for definitive treatment in severe cases

Table 4.2: Comparison of endometriosis and adenomyosis.

Pilot questions 4.2

1. Describe the clinical presentation of endometriosis. (Linked to SLO 4.3)
2. Describe the diagnostic pathway and management options for endometriosis. (Linked to SLO 4.3)



3. Describe the clinical presentation and diagnosis of adenomyosis. (Linked to SLO 4.3)
4. Define chronic pelvic pain and list its potential causes. (Linked to SLO 4.4)
5. Describe the multidisciplinary approach to managing chronic pelvic pain. (Linked to SLO 4.4)

4.3 Genital Tract Injuries and Acquired Gynaetresia

4.3.1 Genital tract injuries

Genital tract injuries may result from obstetric trauma (perineal tears, extensions during instrumental delivery), sexual assault, coital injury, straddle injury, or female genital mutilation, presenting with pain, bleeding, and, depending on severity, haematoma formation or laceration requiring surgical repair, with careful, systematic examination essential to identify the full extent of injury before any repair is attempted.

Vulval and vaginal haematoma can occur following childbirth or trauma even without an obvious external laceration, presenting with severe pain disproportionate to visible findings and, if large, systemic signs of blood loss, and should be actively considered whenever pain seems excessive relative to what is seen, as a concealed haematoma can cause significant, occasionally life-threatening, blood loss if not promptly recognised and evacuated.

Fill in the blank: A vulval or vaginal haematoma may present with pain that is _____ to visible findings. Genital tract injury may result from obstetric trauma, sexual assault, or female genital _____.

4.3.2 Acquired gynaetresia

Gynaetresia refers to acquired stenosis or obstruction of any part of the genital tract, most commonly the cervix or vagina, resulting from scarring after infection (particularly tuberculosis or schistosomiasis in endemic areas), radiotherapy, surgery, female genital mutilation, or severe atrophic change in postmenopausal women, causing outflow obstruction with consequences similar to those of a congenital obstructive anomaly.

Cervical stenosis specifically can follow cervical surgery (such as cone biopsy or LEEP), infection, or radiotherapy, presenting with haematometra (blood accumulation within the uterine cavity), cyclical pain, and, in severe cases, secondary infertility from impaired sperm transport or difficulty accessing the endometrial cavity for assisted reproduction, managed with cervical dilatation, though recurrence is common and may require repeated procedures.

Fill in the blank: Acquired gynaetresia most commonly affects the cervix or _____. Blood accumulation within the uterine cavity from cervical stenosis is termed _____.



4.3.3 Dilatation and curettage

Dilatation and curettage (D&C) involves mechanical dilatation of the cervix followed by curettage or aspiration of the endometrial cavity, historically a common procedure for both diagnostic sampling of the endometrium and therapeutic management of incomplete miscarriage or abnormal uterine bleeding, though it has been substantially superseded by outpatient endometrial sampling (pipelle biopsy) and hysteroscopy for diagnostic purposes given their comparable accuracy with less need for anaesthesia.

Current indications for D&C include therapeutic evacuation of retained products of conception after incomplete miscarriage, particularly where medical management has failed or is contraindicated, and management of significant acute abnormal uterine bleeding not responding to medical treatment, with the procedure carrying recognised risks including uterine perforation, cervical trauma, and, if performed repeatedly or aggressively, intrauterine adhesions (Asherman's syndrome).

Fill in the blank: D&C has been substantially superseded for diagnostic purposes by outpatient pipelle biopsy and _____. A recognised risk of repeated or aggressive D&C is intrauterine adhesions, known as _____ syndrome.

Category	Key Points
Causes of Acquired Gynaetresia	Infection, radiotherapy, surgery, female genital mutilation, atrophic change.
Indications for Dilatation and Curettage	Diagnosis of abnormal uterine bleeding, removal of retained products of conception, evaluation of endometrial pathology, management of incomplete miscarriage, therapeutic evacuation when indicated.

Box 4.3: Causes of acquired gynaetresia and current indications for dilatation and curettage.

Pilot questions 4.3

1. Describe the causes of genital tract injury. (Linked to SLO 4.5)
2. Explain why a vulval or vaginal haematoma should be actively considered after childbirth or trauma. (Linked to SLO 4.5)
3. Describe the causes and presentation of acquired gynaetresia. (Linked to SLO 4.5)
4. Describe the current indications for dilatation and curettage. (Linked to SLO 4.6)
5. Describe the risks associated with dilatation and curettage. (Linked to SLO 4.6)



4.4 Abnormal Uterine Bleeding and Ectopic Gestation

4.4.1 Intermenstrual and post-coital bleeding

Intermenstrual bleeding (bleeding between otherwise regular menstrual periods) may arise from hormonal causes (including missed or irregularly taken hormonal contraception), cervical pathology (polyp, ectropion, or malignancy), endometrial pathology (polyp or, less commonly at this stage, malignancy), or, in pregnant women, from complications such as miscarriage or ectopic pregnancy, making pregnancy testing an essential first step in any woman of reproductive age presenting with this symptom.

Post-coital bleeding (bleeding after sexual intercourse) is most commonly related to cervical ectropion, a benign finding in which the columnar epithelium extends onto the ectocervix, but must always prompt examination of the cervix to exclude cervical polyp, infection, or, critically, cervical malignancy, particularly in women who are not up to date with cervical screening, given the potentially serious underlying diagnosis it can represent.

Fill in the blank: Pregnancy testing is an essential first step in any woman of reproductive age presenting with _____ bleeding. Post-coital bleeding is most commonly related to a benign finding called cervical _____.

4.4.2 Postmenopausal bleeding

Postmenopausal bleeding is any vaginal bleeding occurring twelve months or more after the last menstrual period, and must always be investigated promptly, as while the majority of cases are due to benign causes such as endometrial or vaginal atrophy, endometrial carcinoma is found in a clinically significant minority, making prompt endometrial assessment mandatory rather than optional in every case.

Investigation begins with transvaginal ultrasound measurement of endometrial thickness, with a thin endometrial stripe carrying a low but not zero risk of malignancy, and any thickened endometrium, persistent or recurrent bleeding despite a thin endometrium, or other risk factors prompting endometrial biopsy (by pipelle or hysteroscopy-directed sampling) to definitively exclude carcinoma before reassurance is given.

Fill in the blank: Postmenopausal bleeding is defined as bleeding occurring _____ months or more after the last menstrual period. Investigation of postmenopausal bleeding begins with transvaginal ultrasound measurement of _____ thickness.

4.4.3 Ectopic gestation

Ectopic pregnancy is implantation of a fertilised ovum outside the uterine cavity, most commonly within the fallopian tube (particularly the ampulla), with risk factors including previous ectopic pregnancy, pelvic inflammatory disease, previous tubal surgery, and assisted reproduction, presenting classically with amenorrhoea, abdominal pain, and vaginal bleeding,



though presentation can be highly variable and a high index of suspicion is essential in any woman of reproductive age with a positive pregnancy test and pain.

Diagnosis combines serum beta-hCG (which characteristically fails to rise as expected for a viable intrauterine pregnancy) with transvaginal ultrasound to look for an intrauterine gestational sac and any adnexal mass, and management ranges from expectant or medical management (methotrexate) in selected, haemodynamically stable, early cases with low beta-hCG, to emergency laparoscopic salpingectomy or salpingotomy when there is tubal rupture or haemodynamic instability, a genuine gynaecological emergency.

Fill in the blank: Ectopic pregnancy most commonly implants within the _____ of the fallopian tube. Medical management of a suitable ectopic pregnancy uses the drug _____.

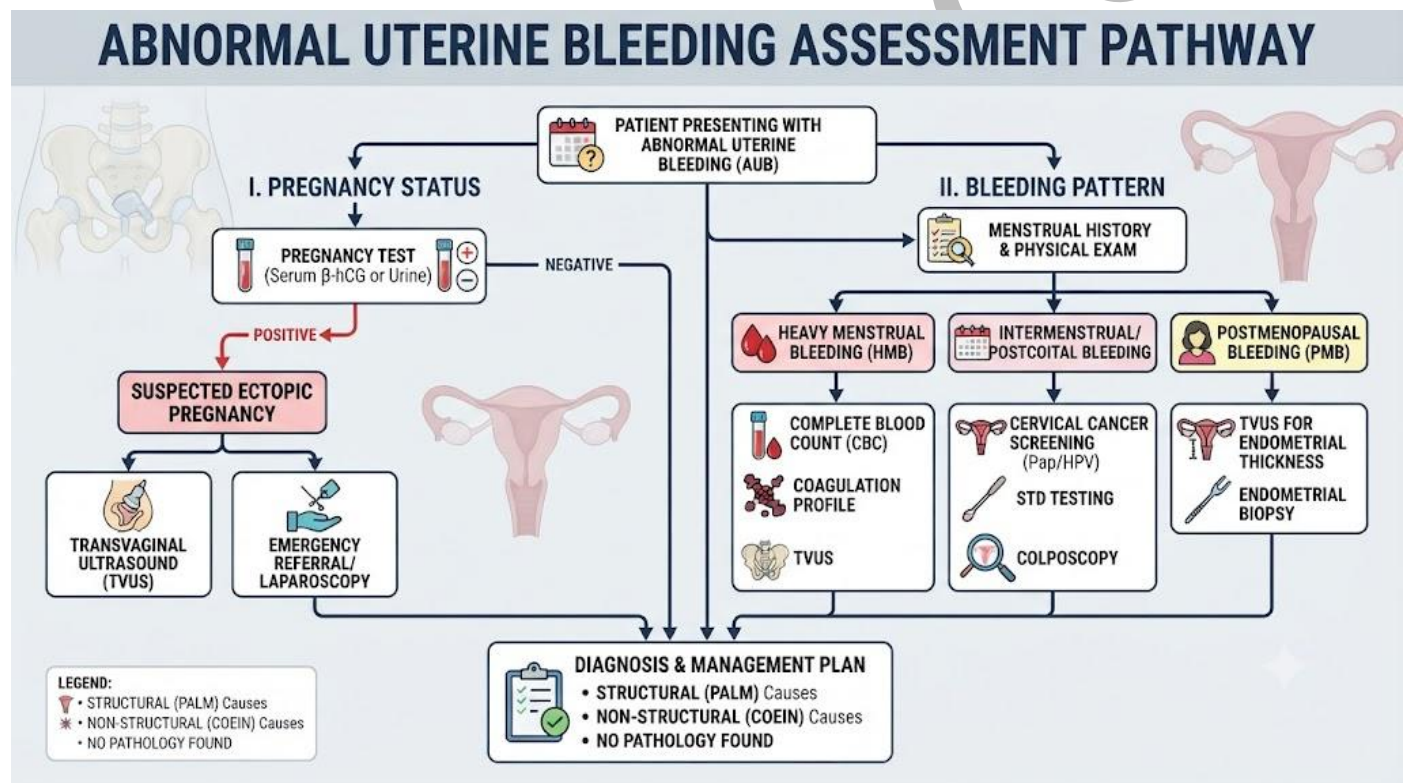


Figure 4.4: Assessment pathway for abnormal uterine bleeding by pattern and pregnancy status.

Pilot questions 4.4

1. Describe the causes of intermenstrual bleeding. (Linked to SLO 4.7)
2. Explain the significance of post-coital bleeding and its most common cause. (Linked to SLO 4.7)
3. Explain why postmenopausal bleeding requires prompt investigation. (Linked to SLO 4.7)



4. Describe the risk factors and clinical presentation of ectopic pregnancy. (Linked to SLO 4.7)
5. Describe the diagnosis and management options for ectopic pregnancy. (Linked to SLO 4.7)

4.5 Displacements of the Female Genitalia

4.5.1 Uterine prolapse

Uterine (pelvic organ) prolapse is the descent of the uterus, vaginal walls, or both, from their normal anatomical position due to weakness of the supporting ligaments and pelvic floor musculature, most commonly resulting from vaginal childbirth (particularly with prolonged second stage or instrumental delivery), advancing age, menopause, chronic raised intra-abdominal pressure (obesity, chronic cough, constipation), and connective tissue disorders.

Prolapse is graded using systems such as the Pelvic Organ Prolapse Quantification (POP-Q) system, and presents with a sensation of vaginal fullness, pressure, or a visible or palpable bulge, often worse at the end of the day or with prolonged standing, along with associated urinary symptoms (stress incontinence or, with severe prolapse, voiding difficulty from kinking of the urethra) and, less commonly, bowel symptoms.

Fill in the blank: Prolapse is graded using systems such as the Pelvic Organ Prolapse _____ (POP-Q) system. Severe prolapse can cause voiding difficulty from kinking of the _____.

4.5.2 Retroversion and other uterine displacements

Uterine retroversion (the uterus tilted posteriorly rather than the normal anteverted position) is a normal anatomical variant in around one in five women, usually asymptomatic and requiring no treatment, though a small proportion of women with a retroverted uterus experience deep dyspareunia or pelvic discomfort, and, rarely, an acutely retroverted gravid uterus can become incarcerated in the pelvis in early pregnancy, causing urinary retention requiring prompt recognition and manual repositioning.

Other displacements include uterine inversion (a rare but serious obstetric emergency in which the uterine fundus inverts through the cervix, typically following mismanaged delivery of the placenta, causing severe pain and haemorrhagic shock requiring immediate manual replacement), and torsion of the uterus or an adnexal mass, both surgical emergencies requiring urgent recognition and intervention.

Fill in the blank: Uterine retroversion is a normal anatomical variant present in around one in _____ women. Uterine inversion is a rare obstetric emergency typically following mismanaged delivery of the _____.



4.5.3 Management of pelvic organ prolapse

Conservative management of pelvic organ prolapse includes pelvic floor muscle training (particularly effective for mild prolapse), lifestyle modification (weight loss, treatment of chronic cough or constipation), and vaginal pessary use, a well-tolerated, reversible, non-surgical option suitable for women wishing to avoid or delay surgery, or those unfit for surgical intervention, requiring regular review and replacement.

Surgical management is considered for symptomatic prolapse not adequately managed conservatively, ranging from native tissue repair (anterior or posterior colporrhaphy) to procedures addressing apical support (sacrospinous fixation or sacrocolpopexy), and, in women who have completed childbearing and where prolapse is severe, vaginal hysterectomy combined with vault support, with the specific procedure chosen according to the compartment and severity of prolapse and the woman's individual priorities and preferences.

Fill in the blank: A well-tolerated, reversible, non-surgical option for managing pelvic organ prolapse is the vaginal _____. Surgical repair of the anterior or posterior vaginal wall is called _____.

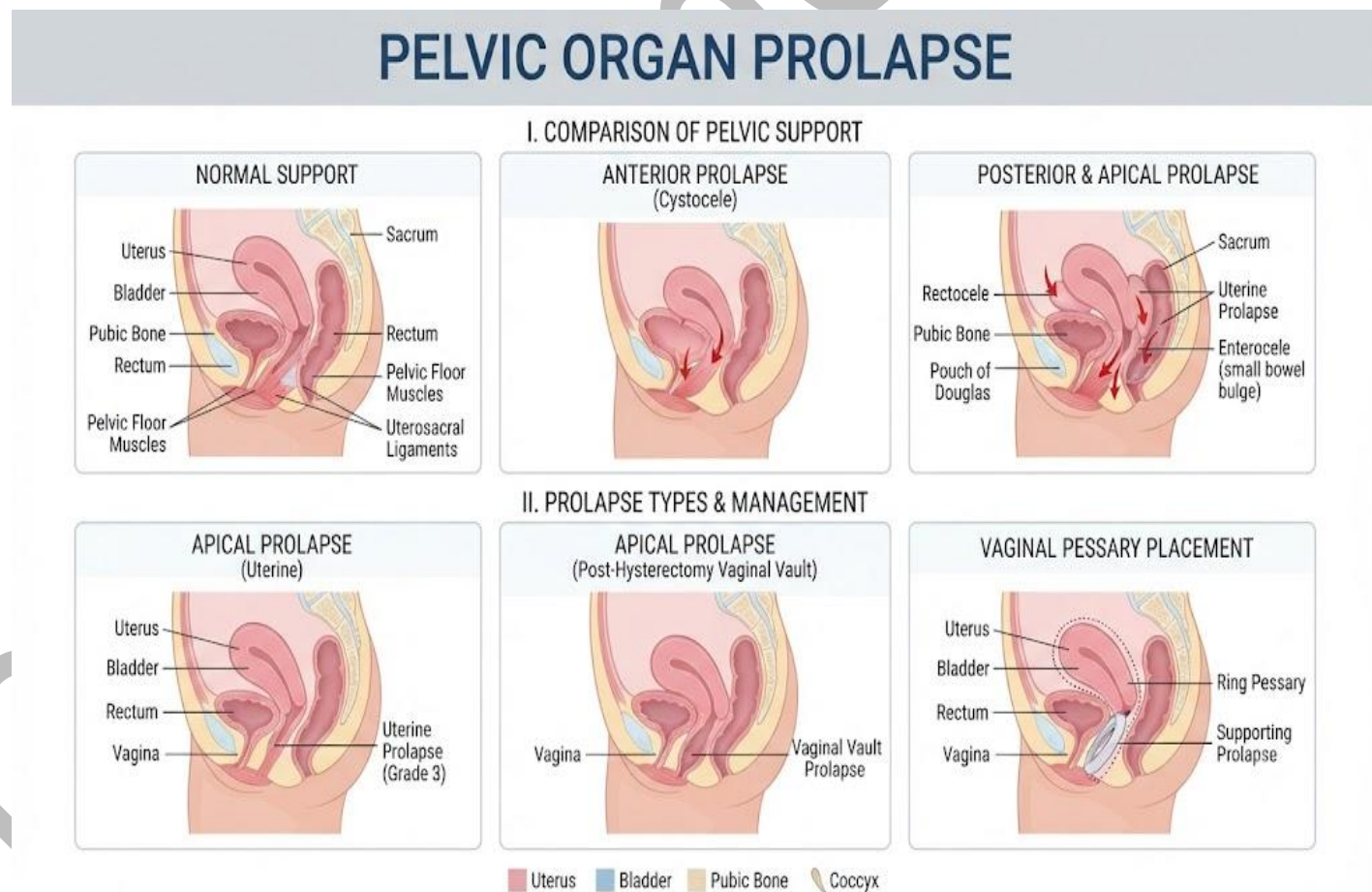


Figure 4.5: Anatomy of pelvic organ prolapse by compartment and vaginal pessary placement.



Pilot questions 4.5

- Describe the risk factors for uterine and pelvic organ prolapse. (Linked to SLO 4.8)
- Describe the grading and clinical presentation of pelvic organ prolapse. (Linked to SLO 4.8)
- Explain the clinical significance of uterine retroversion. (Linked to SLO 4.8)
- Describe uterine inversion and its emergency management. (Linked to SLO 4.8)
- Compare conservative and surgical management options for pelvic organ prolapse. (Linked to SLO 4.8)

Series Summary

This Series has covered paediatric and congenital gynaecology, from Mullerian duct anomalies and disorders of sexual development through to acquired childhood disorders, followed by endometriosis, adenomyosis, and chronic pelvic pain. It went on to examine genital tract injuries, acquired gynaetresia, and dilatation and curettage, then abnormal uterine bleeding and ectopic gestation, before concluding with displacements of the female genitalia, including pelvic organ prolapse and its management.

You should now be able to describe the congenital and acquired gynaecological disorders of childhood, describe the presentation and management of endometriosis, adenomyosis, and chronic pelvic pain, describe genital tract injuries and gynaetresia, describe the causes and management of abnormal uterine bleeding and ectopic gestation, and describe the causes and management of pelvic organ prolapse (Linked to SLOs 4.1 to 4.8).

Glossary of Terms

1. **Adenomyosis:** the presence of endometrial glands and stroma within the myometrium, causing uterine enlargement.
2. **Asherman's syndrome:** intrauterine adhesions, a recognised risk of repeated or aggressive dilatation and curettage.
3. **Cervical ectropion:** a benign finding in which columnar epithelium extends onto the ectocervix, a common cause of post-coital bleeding.



4. **Disorders of sexual development (DSD):** congenital conditions in which chromosomal, gonadal, or anatomical sex is atypical.
5. **Ectopic pregnancy:** implantation of a fertilised ovum outside the uterine cavity, most commonly within the fallopian tube.
6. **Endometriosis:** the presence of endometrial-like tissue outside the uterine cavity.
7. **Gynaetresia:** acquired stenosis or obstruction of any part of the genital tract.
8. **Haematocolpos:** accumulation of menstrual blood in the vagina, typically from an imperforate hymen.
9. **Mullerian agenesis:** absent or rudimentary uterus and upper vagina in a phenotypically normal female with normal ovaries, also called Mayer-Rokitansky-Kuster-Hauser syndrome.
10. **POP-Q system:** the Pelvic Organ Prolapse Quantification system, used to grade the severity of prolapse.
11. **Vaginal pessary:** a reversible, non-surgical device used to manage pelvic organ prolapse.
12. **Vulvovaginitis:** inflammation of the vulva and vagina, the most common gynaecological complaint in prepubertal girls.

Concept Check Questions [Series 4]

Objective questions

- Absent or rudimentary uterus with normal ovaries and karyotype is termed _____ syndrome.
- Definitive diagnosis of adenomyosis remains _____, typically confirmed only after hysterectomy.
- Post-coital bleeding is most commonly related to a benign finding called cervical _____.
- Ectopic pregnancy most commonly implants within the _____ of the fallopian tube.
- Prolapse is graded using systems such as the Pelvic Organ Prolapse _____ (POP-Q) system.



Short-answer questions

1. Distinguish central from peripheral precocious puberty. (Linked to SLO 4.2)
2. Define chronic pelvic pain and list its potential causes. (Linked to SLO 4.4)
3. Explain why a vulval or vaginal haematoma should be actively considered after childbirth or trauma. (Linked to SLO 4.5)
4. Explain why postmenopausal bleeding requires prompt investigation. (Linked to SLO 4.7)
5. Explain the clinical significance of uterine retroversion. (Linked to SLO 4.8)

Long-answer questions

6. Describe the congenital anomalies of the female genital tract and disorders of sexual development. (Linked to SLO 4.1)
7. Describe the clinical presentation, diagnosis, and management of endometriosis. (Linked to SLO 4.3)
8. Describe the causes and presentation of acquired gynaetresia and the current indications for D&C. (Linked to SLO 4.5, SLO 4.6)
9. Describe the causes, investigation, and management of ectopic pregnancy. (Linked to SLO 4.7)
10. Describe the risk factors, presentation, and management of pelvic organ prolapse. (Linked to SLO 4.8)

Answers to Concept Check Questions [Series 4]

Objective questions

11. Mayer-Rokitansky-Kuster-Hauser.
12. Histological.
13. Ectropion.
14. Ampulla.
15. Quantification.



Short-answer questions

16. Central precocious puberty is gonadotropin-dependent, requiring exclusion of an intracranial lesion; peripheral is gonadotropin-independent, from an ovarian or adrenal source.
17. Pain lasting six months or longer, from gynaecological, gastrointestinal, urological, or musculoskeletal causes, often with more than one contributing factor.
18. A concealed haematoma can cause severe, occasionally life-threatening blood loss with pain disproportionate to visible findings, so it must be actively considered.
19. Endometrial carcinoma is found in a clinically significant minority of cases, so prompt assessment is mandatory rather than optional.
20. It is usually a normal asymptomatic variant, though a small proportion experience dyspareunia, and rarely an incarcerated gravid retroverted uterus causes urinary retention.

Long-answer questions

21. **Basic response:** Mullerian duct anomalies range from agenesis to septate and bicornuate uterus, while DSD is classified as 46,XX, 46,XY, or gonadal development disorders.

Value-added response: Management of DSD requires a specialist multidisciplinary team, with decisions individualised and, wherever possible, centred on the affected individual's own voice.

22. **Basic response:** Endometriosis presents with cyclical pelvic pain, dysmenorrhoea, dyspareunia, and subfertility, definitively diagnosed by laparoscopy and managed medically or surgically.

Value-added response: Symptom severity correlates poorly with disease extent, and management should be tailored to the woman's symptoms, fertility wishes, and preferences.

23. **Basic response:** Acquired gynaetresia results from infection, radiotherapy, surgery, or atrophic change, while D&C is now mainly reserved for evacuation of retained products and acute bleeding.

Value-added response: D&C carries recognised risks including uterine perforation and Asherman's syndrome, reinforcing its more selective modern use compared with historical practice.



24. Basic response: Ectopic pregnancy presents with amenorrhoea, pain, and bleeding, diagnosed by serum beta-hCG and ultrasound, managed expectantly, medically, or surgically depending on stability.

Value-added response: Ruptured or haemodynamically unstable ectopic pregnancy is a genuine gynaecological emergency requiring immediate surgical intervention.

25. Basic response: Pelvic organ prolapse results from pelvic floor weakness from childbirth, age, and raised intra-abdominal pressure, graded by POP-Q and managed conservatively or surgically.

Value-added response: Vaginal pessary use offers a reversible option for women wishing to avoid or delay surgery, while surgical repair is tailored to the compartment and severity of prolapse.

Answers to Pilot Questions [Series 4]

Part 4.1

1. From Mullerian agenesis to septate, bicornuate, didelphic, and unicornuate uterus, from abnormal fusion or resorption of the paramesonephric ducts.
2. Presents at puberty with cyclical pain and primary amenorrhoea from haematocolpos, managed with surgical incision to allow drainage.
3. 46,XX DSD (commonly congenital adrenal hyperplasia), 46,XY DSD (including androgen insensitivity syndrome), and disorders of gonadal development.
4. Vulvovaginitis, from thin oestrogen-deficient epithelium predisposing to irritation, non-specific infection, or a retained foreign body.
5. Central precocious puberty is gonadotropin-dependent, requiring exclusion of intracranial lesion; peripheral is gonadotropin-independent, from an ovarian or adrenal source.

Part 4.2

6. Cyclical or chronic pelvic pain, dysmenorrhoea, deep dyspareunia, and subfertility, poorly correlated with disease extent at laparoscopy.
7. Ultrasound or MRI suggests the diagnosis; laparoscopy is definitive; management ranges from analgesia and hormonal suppression to surgical excision.



8. Heavy, painful periods with a diffusely enlarged, tender, boggy uterus, most common in multiparous women in their late reproductive years.
9. Pain lasting six months or longer from gynaecological, gastrointestinal, urological, or musculoskeletal causes, often multifactorial.
10. Analgesia, hormonal treatment where a gynaecological cause is identified, physiotherapy, and psychological support.

Part 4.3

11. Obstetric trauma, sexual assault, coital injury, straddle injury, and female genital mutilation.
12. It can cause significant, occasionally life-threatening blood loss with pain disproportionate to visible findings if not promptly recognised.
13. Infection, radiotherapy, surgery, female genital mutilation, or severe atrophic change, causing outflow obstruction.
14. Therapeutic evacuation of retained products after incomplete miscarriage and management of acute abnormal bleeding unresponsive to medical treatment.
15. Uterine perforation, cervical trauma, and, with repeated procedures, intrauterine adhesions (Asherman's syndrome).

Part 4.4

1. Hormonal causes, cervical or endometrial pathology, and, in pregnant women, miscarriage or ectopic pregnancy.
2. Post-coital bleeding is most commonly from cervical ectropion but must always prompt examination to exclude polyp, infection, or malignancy.
3. Endometrial carcinoma is found in a clinically significant minority of cases despite most being benign, requiring mandatory prompt assessment.
4. Previous ectopic pregnancy, pelvic inflammatory disease, previous tubal surgery, and assisted reproduction; presents with amenorrhoea, pain, and bleeding.
5. Serum beta-hCG and transvaginal ultrasound for diagnosis; management from expectant or medical (methotrexate) to emergency surgery depending on stability.



Part 4.5

1. Vaginal childbirth, advancing age, menopause, chronic raised intra-abdominal pressure, and connective tissue disorders.
2. Graded by the POP-Q system, presenting with vaginal fullness, pressure, a bulge, and associated urinary or bowel symptoms.
3. Usually asymptomatic, though a small proportion experience dyspareunia, and rarely an incarcerated gravid uterus causes urinary retention.
4. Inversion of the uterine fundus through the cervix, typically after mismanaged placental delivery, requiring immediate manual replacement.
5. Conservative management includes pelvic floor training and pessary use; surgical management includes native tissue repair and apical support procedures.

References and Attributions [Series 4]

Textual References

6. Hoffman, B. L., Schorge, J. O., Halvorson, L. M. et al. (2020). Williams Gynecology (4th ed.). McGraw Hill.
7. Berek, J. S. and Berek, D. L. (2019). Berek and Novak's Gynecology (16th ed.). Wolters Kluwer.
8. Royal College of Obstetricians and Gynaecologists (2017). Green-top Guideline No. 41: Ectopic Pregnancy and Miscarriage. RCOG Press.
9. Haylen, B. T., Maher, C. F., Barber, M. D. et al. (2016). An International Urogynecological Association and International Continence Society Joint Report on the Terminology for Female Pelvic Organ Prolapse. International Urogynecology Journal, 27(4), 655 to 684.



Figures, Plates, Tables, and Boxes

1. Figure 4.1: Spectrum of Mullerian duct anomalies and imperforate hymen with haematocolpos. AI-generated using the prompt: "Create a professional medical diagram titled Congenital Anomalies of the Female Genital Tract, showing Mullerian duct anomaly variants and imperforate hymen with haematocolpos. Clean clinical educational diagram style."
2. Table 4.2: Comparison of endometriosis and adenomyosis. AI-generated using the prompt: "Create a clean reference table titled Endometriosis versus Adenomyosis, comparing patient profile, symptoms, diagnosis, and management. Simple clinical reference table style with outside border."
3. Box 4.3: Causes of acquired gynaetresia and current indications for dilatation and curettage. AI-generated using the prompt: "Create a simple single-column reference box with an outside border titled Gynaetresia Causes and D&C Indications, listing key causes and current indications. Clinical reference box style."
4. Figure 4.4: Assessment pathway for abnormal uterine bleeding by pattern and pregnancy status. AI-generated using the prompt: "Create a professional medical flowchart titled Abnormal Uterine Bleeding Assessment Pathway, branching by bleeding pattern and pregnancy status to appropriate investigations, including suspected ectopic pregnancy. Clean clinical educational diagram style."
5. Figure 4.5: Anatomy of pelvic organ prolapse by compartment and vaginal pessary placement. AI-generated using the prompt: "Create a professional medical diagram titled Pelvic Organ Prolapse, showing a sagittal comparison of normal support with anterior, posterior, and apical prolapse, plus vaginal pessary placement. Clean clinical educational diagram style."



Course code: OBG 501

Course title: General Gynaecology

Course credit load: 3 Units

Series 5: Medical Ethics, Forensic Issues, and Gender-Based Violence

- **Part 5.1: Medical Ethics in Gynaecology**
 - Sub Part 5.1.1: Historical perspective of medical ethics
 - Sub Part 5.1.2: Principles of medical ethics in gynaecological practice
 - Sub Part 5.1.3: Informed consent
- **Part 5.2: Forensic Medicine and Medicolegal Documentation**
 - Sub Part 5.2.1: Forensic medicine and litigation in gynaecology
 - Sub Part 5.2.2: Sick leave and medical certification
 - Sub Part 5.2.3: Death certification
- **Part 5.3: Abortion and Legal Considerations**
 - Sub Part 5.3.1: Legal and ethical framework of abortion in Nigeria
 - Sub Part 5.3.2: Clinical management of abortion
 - Sub Part 5.3.3: Complications of unsafe abortion
- **Part 5.4: Sexual Assault**
 - Sub Part 5.4.1: History taking from victims of sexual assault
 - Sub Part 5.4.2: Physical examination of victims of sexual assault
 - Sub Part 5.4.3: Investigations, sample collection, and the psychological toll of rape
- **Part 5.5: Domestic and Gender-Based Violence**
 - Sub Part 5.5.1: Epidemiology and risk factors for domestic violence
 - Sub Part 5.5.2: Healthcare implications and signs and symptoms of domestic violence



- Sub Part 5.5.3: Documentation in suspected domestic violence

Introduction

In the last Series, we explored a wide range of gynaecological disorders spanning the entire reproductive lifespan. We conclude this course, and this entire journey through General Gynaecology, with a Series unlike any other: the ethical, legal, and forensic dimensions of practice, and the care of women affected by sexual assault and domestic violence. These topics ask something different of you as a clinician, not just clinical knowledge, but judgement, compassion, and an unwavering commitment to the dignity of every patient who places their trust in you, often at their most vulnerable moment.

The aim of this Series is to equip you with the ethical, legal, and forensic knowledge required for gynaecological practice, and the skills to provide sensitive, competent care to survivors of sexual assault and domestic violence.

We shall commence this Series by examining medical ethics in gynaecology, from its historical origins through to the principles of informed consent. Next, we will consider forensic medicine, litigation, sick leave, and death certification. Following that, our attention turns to the legal and clinical aspects of abortion in Nigeria. We will then explore the care of survivors of sexual assault, covering history, examination, and investigation. Finally, we will conclude by examining domestic and gender-based violence, its recognition, and appropriate documentation.

Series Learning Outcomes

Upon completing this Series, you should be able to:

- **SLO 5.1:** discuss the historical perspective and principles of medical ethics in gynaecology,
- **SLO 5.2:** explain the principle and process of informed consent in gynaecological practice,
- **SLO 5.3:** describe forensic medicine, litigation, sick leave, and death certification in gynaecological practice,
- **SLO 5.4:** discuss the legal, ethical, and clinical aspects of abortion in Nigeria,
- **SLO 5.5:** describe history taking and physical examination of victims of sexual assault,
- **SLO 5.6:** describe relevant investigations, sample collection, and the psychological toll of rape,



- **SLO 5.7:** discuss who is affected by domestic violence and its healthcare implications, risk factors, and lethality issues, and
- **SLO 5.8:** recognise the signs and symptoms of domestic violence and describe appropriate documentation.

5.1 Medical Ethics in Gynaecology

5.1.1 Historical perspective of medical ethics

Medical ethics traces its formal origins to the Hippocratic Oath, which first articulated the duty to benefit the patient and avoid harm, but modern medical ethics as practised today was substantially shaped by the aftermath of documented historical abuses, including unethical research practices, which prompted the development of formal ethical codes and, eventually, institutional research ethics review as a safeguard against the recurrence of such abuses.

Contemporary medical ethics in gynaecology has continued to evolve in response to advances such as assisted reproduction, prenatal diagnosis, and expanding surgical capability, each raising new ethical questions around consent, resource allocation, and patient autonomy that were simply not anticipated by earlier ethical frameworks, underscoring that medical ethics is a living discipline that must adapt as clinical practice itself advances.

Fill in the blank: Medical ethics traces its formal origins to the _____ Oath. Documented historical research abuses prompted the development of formal ethical codes and institutional research ethics _____.

5.1.2 Principles of medical ethics in gynaecological practice

The four pillars of medical ethics widely applied in clinical practice are autonomy (the patient's right to make informed decisions about their own care), beneficence (acting in the patient's best interest), non-maleficence (avoiding harm), and justice (fair and equitable distribution of healthcare resources), each carrying particular weight in gynaecological practice given its frequent intersection with deeply personal decisions around fertility, sexuality, and bodily autonomy.

Confidentiality is a further cornerstone principle of particular importance in gynaecological and obstetric practice, given the sensitive nature of much of the information disclosed, though it is not absolute, and situations such as a genuine risk of serious harm to the patient or a third party, or a legal requirement to disclose, may justify a carefully considered breach, always applying the minimum necessary disclosure.

Fill in the blank: The four pillars of medical ethics are autonomy, beneficence, non-maleficence, and _____. Confidentiality is not absolute and may be justifiably breached where there is a genuine risk of serious _____.



5.1.3 Informed consent

Valid informed consent requires that the patient has capacity to make the decision, has received adequate information about the proposed intervention (including its purpose, risks, benefits, and reasonable alternatives, including the option of no treatment), and gives consent voluntarily, free from coercion, with these three elements, capacity, information, and voluntariness, all required together for consent to be considered legally and ethically valid.

Consent for gynaecological procedures carries particular sensitivity given its frequent implications for fertility and sexual function, and the discussion should specifically address these implications wherever relevant, with written consent generally required for any invasive procedure and verbal consent, carefully documented, sufficient for less invasive examinations and interventions such as a routine pelvic examination.

Fill in the blank: Valid informed consent requires capacity, information, and _____.
Consent discussions for gynaecological procedures should specifically address implications for fertility and sexual _____.

Principle	Definition
Autonomy	Respecting the patient's right to make informed decisions about their own care.
Beneficence	Acting in the best interest of the patient to promote wellbeing.
Non-Maleficence	Avoiding harm and minimizing risks in medical practice.
Justice	Ensuring fairness, equity, and equal access to healthcare.
Elements of Consent	Consent must be informed, voluntary, and given by a competent patient.

Box 5.1: The four pillars of medical ethics and the elements of valid informed consent.

Pilot questions 5.1

- Describe the historical origins of formal medical ethics. (Linked to SLO 5.1)
- Explain how contemporary medical ethics in gynaecology has evolved with advancing clinical practice. (Linked to SLO 5.1)
- Describe the four pillars of medical ethics. (Linked to SLO 5.1)
- Explain the circumstances in which patient confidentiality may be justifiably breached. (Linked to SLO 5.1)



- Describe the three elements required for valid informed consent. (Linked to SLO 5.2)

5.2 Forensic Medicine and Medicolegal Documentation

5.2.1 Forensic medicine and litigation in gynaecology

Forensic gynaecology applies medical knowledge to legal questions arising in gynaecological practice, most commonly in cases of sexual assault, disputed paternity, or age assessment, requiring meticulous, objective documentation, as clinical records may later form central evidence in legal proceedings, making accuracy and completeness at the time of examination far more valuable than any later reconstruction from memory.

Medical litigation in gynaecological practice most commonly arises from alleged failure to obtain adequate informed consent, delayed diagnosis (particularly of malignancy or ectopic pregnancy), and surgical complications, with thorough, contemporaneous documentation of clinical reasoning, consent discussions, and the information given to the patient representing the single most effective protection against successful litigation, alongside, of course, providing genuinely competent clinical care.

Fill in the blank: Forensic gynaecology requires meticulous, objective _____, as clinical records may later form central evidence in legal proceedings. A common cause of gynaecological litigation is delayed diagnosis, particularly of malignancy or _____ pregnancy.

5.2.2 Sick leave and medical certification

Medical certification for sick leave requires the certifying doctor to have personally assessed the patient and to certify only the period of incapacity genuinely supported by clinical findings, as issuing a certificate without adequate assessment, or for a period not clinically justified, constitutes a serious breach of professional integrity with potential legal and regulatory consequences for the certifying doctor.

Gynaecological conditions commonly requiring sick leave certification include the postoperative recovery period following major gynaecological surgery, severe dysmenorrhoea or menorrhagia significantly affecting function, and complications of pregnancy, with the certificate specifying the diagnosis only where the patient consents to its disclosure to the employer, respecting the patient's right to medical confidentiality wherever this can reasonably be balanced against the employer's legitimate need for information.

Fill in the blank: A sick leave certificate should specify only the period of incapacity genuinely supported by _____ findings. The diagnosis should be disclosed on a sick leave certificate only where the patient gives _____.

5.2.3 Death certification



Death certification requires accurate documentation of the immediate cause of death and any underlying or contributing conditions, following a structured format distinguishing the immediate cause (part 1a), any antecedent causes leading to it (part 1b and 1c), and other significant conditions contributing to death but not directly causing it (part 2), a distinction commonly a source of error if not carefully applied.

Maternal deaths require particular care in certification, as accurate identification of a death as maternal (occurring during pregnancy or within 42 days of its end, from a cause related to or aggravated by the pregnancy) is essential for accurate national maternal mortality surveillance, and any death that may fall into this category should trigger the relevant institutional maternal death review process in addition to standard certification.

Fill in the blank: A maternal death is defined as occurring during pregnancy or within _____ days of its end, from a cause related to the pregnancy. The immediate cause of death is recorded in part _____ of the death certificate.

Section	Description	Example
<u>Part 1a – Immediate Cause</u>	The final disease or condition directly leading to death	Myocardial infarction
<u>Part 1b – Antecedent Cause</u>	Condition giving rise to the immediate cause	Coronary artery thrombosis
<u>Part 1c – Antecedent Cause</u>	Underlying condition initiating the chain of events	Atherosclerosis
<u>Part 2 – Other Significant Conditions</u>	Other diseases or factors contributing to death but not part of the direct sequence	Diabetes mellitus

Table 5.2: Structure of the death certificate and its component parts.

Pilot questions 5.2

1. Explain why meticulous documentation is essential in forensic gynaecology. (Linked to SLO 5.3)
2. Describe the common causes of medical litigation in gynaecological practice. (Linked to SLO 5.3)
3. Describe the principles governing sick leave certification. (Linked to SLO 5.3)
4. Describe the structure of a death certificate. (Linked to SLO 5.3)



5. Explain the definition of a maternal death and its significance for certification. (Linked to SLO 5.3)

5.3 Abortion and Legal Considerations

5.3.1 Legal and ethical framework of abortion in Nigeria

Nigerian law restricts abortion to circumstances where it is performed to preserve the life of the pregnant woman, a considerably more restrictive legal framework than in many other countries, resulting in a substantial burden of unsafe abortion performed outside this legal framework, a major and largely preventable contributor to maternal morbidity and mortality across the country.

Healthcare providers have a professional obligation to provide appropriate, non-judgemental care to any woman presenting with a complication of abortion, whether spontaneous or induced, safe or unsafe, regardless of the legal circumstances surrounding it, as the ethical duty to treat and the legal restriction on performing the procedure itself are entirely separate considerations that should never be conflated in clinical practice.

Fill in the blank: Nigerian law restricts abortion to circumstances where it is performed to preserve the _____ of the pregnant woman. Healthcare providers have a professional obligation to provide non-judgemental care regardless of the _____ circumstances of an abortion.

5.3.2 Clinical management of abortion

Management of miscarriage (spontaneous abortion), which is legally and ethically distinct from induced abortion, includes expectant, medical (misoprostol), or surgical management, chosen according to gestational age, the woman's clinical stability and preference, and whether products of conception have been completely or incompletely passed, with all options offering broadly comparable safety and effectiveness in appropriately selected patients.

Postabortion care is a recognised standard of care applicable regardless of the legal circumstances of the abortion, encompassing treatment of any complications, contraceptive counselling to prevent future unwanted pregnancy, and, where appropriate and desired by the patient, referral for further psychological or social support, reflecting a harm-reduction approach to a clinical reality that healthcare providers must engage with compassionately.

Fill in the blank: Management options for miscarriage include expectant, medical, or _____ management, chosen according to gestational age and clinical circumstances. Postabortion care includes treatment of complications and _____ counselling to prevent future unwanted pregnancy.

5.3.3 Complications of unsafe abortion



Unsafe abortion carries substantial risk of serious complications, including incomplete evacuation with retained products of conception, haemorrhage, sepsis (sometimes severe, with the potential to progress to septic shock), uterine perforation, and, particularly with unskilled instrumentation, injury to adjacent structures such as the bowel or bladder, together representing a major, largely preventable contributor to maternal death in Nigeria.

Management of complications follows standard emergency principles: resuscitation, broad-spectrum antibiotics where sepsis is suspected, evacuation of any retained products, and surgical repair of any identified visceral injury, with prompt recognition and aggressive early management critical to reducing the mortality associated with the more severe presentations of unsafe abortion complications.

Fill in the blank: Unsafe abortion carries risk of serious complications including haemorrhage, _____, and uterine perforation. Management of complicated unsafe abortion follows standard emergency principles including _____ and broad-spectrum antibiotics.

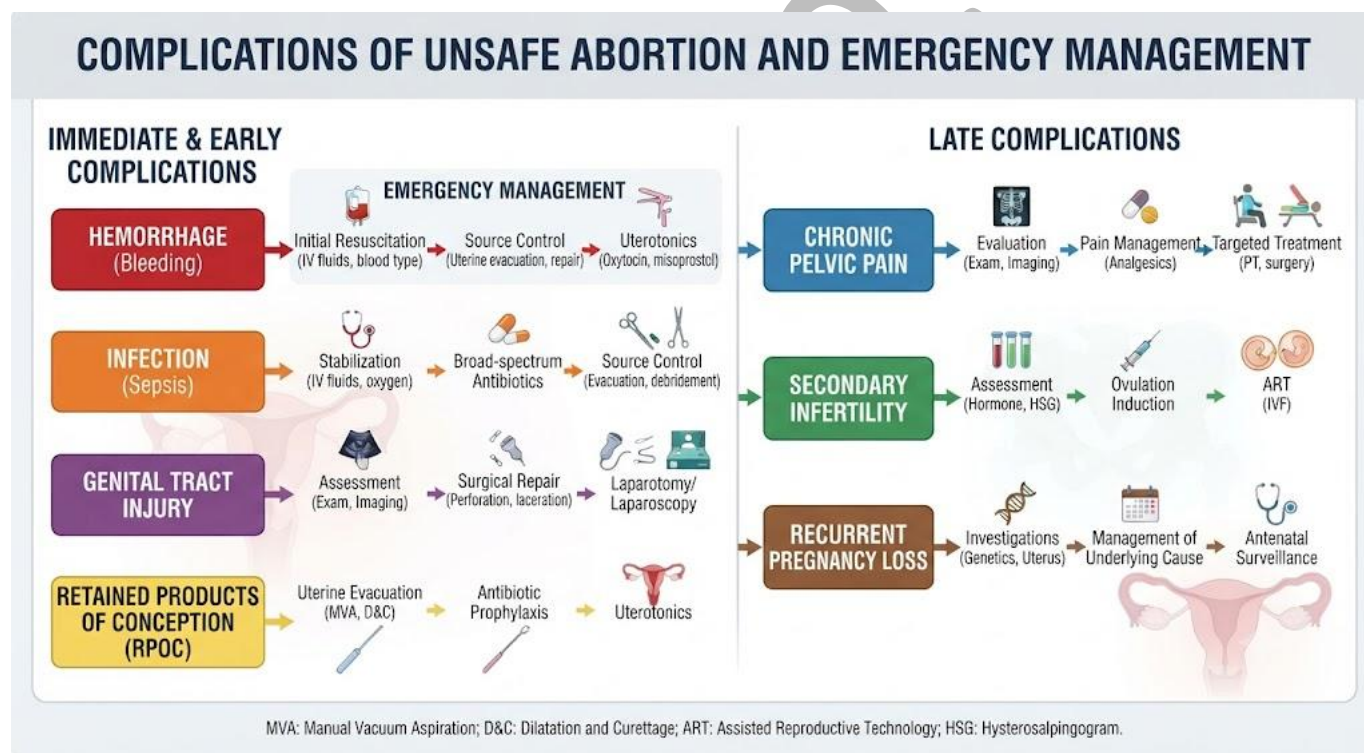


Figure 5.3: Complications of unsafe abortion and their emergency management pathway.

Pilot questions 5.3

1. Describe the legal framework governing abortion in Nigeria. (Linked to SLO 5.4)
2. Explain the ethical obligation of healthcare providers when caring for a woman with a complication of abortion. (Linked to SLO 5.4)
3. Describe the management options for miscarriage. (Linked to SLO 5.4)



4. Describe the components of postabortion care. (Linked to SLO 5.4)
5. Describe the complications of unsafe abortion and their emergency management. (Linked to SLO 5.4)

5.4 Sexual Assault

5.4.1 History taking from victims of sexual assault

History taking from a survivor of sexual assault requires a private, unhurried, non-judgemental setting, beginning with an explanation of the purpose and process of the assessment and explicit reassurance that the survivor retains control over what they choose to share and at what pace, with the history covering the nature and timing of the assault (relevant to forensic sample collection and pregnancy or infection risk assessment), and relevant medical, gynaecological, and contraceptive history.

Throughout the history the clinician should avoid leading questions, judgemental language, or any implication of disbelief, and should be alert to signs of ongoing risk, such as continued contact with the perpetrator or the presence of other vulnerable individuals in the same household, all of which may require safeguarding referral in addition to the immediate medical assessment being undertaken.

Fill in the blank: History taking from a sexual assault survivor should take place in a private, unhurried, and _____ setting. Clinicians should avoid _____ questions and judgemental language throughout the assessment.

5.4.2 Physical examination of victims of sexual assault

Physical examination following sexual assault requires explicit, ongoing consent at every stage, ideally performed by a practitioner with specific forensic examination training where available, systematically documenting any injury (site, size, and characteristics) using body diagrams and, where possible, photography with appropriate consent, as thorough contemporaneous documentation is of considerable importance for both clinical management and any subsequent legal proceedings.

The examination includes general examination for injury beyond the genital area (as assault frequently causes injury elsewhere on the body), genital and, where relevant, anal examination for injury, and collection of forensic samples according to a validated protocol, all conducted with continuous attention to the survivor's comfort, autonomy, and the ability to pause or stop the examination at any point without needing to justify the request.

Fill in the blank: Physical examination following sexual assault requires explicit, ongoing _____ at every stage. Injuries should be documented using body diagrams and, where possible, _____ with appropriate consent.



5.4.3 Investigations, sample collection, and the psychological toll of rape

Forensic sample collection (following a validated protocol and chain of custody procedure to preserve evidential integrity) should be considered within the window in which forensic evidence is likely to remain detectable, typically up to 72 hours though this varies, alongside clinical investigations including pregnancy testing, screening for sexually transmitted infections, and baseline bloods, with emergency contraception and post-exposure prophylaxis for HIV and other infections offered as clinically indicated.

The psychological and emotional toll of rape is profound and can include acute traumatic stress, longer-term post-traumatic stress disorder, depression, anxiety, and substantial disruption to relationships, sexual function, and daily life, and every survivor should be offered onward referral for psychological support and counselling as an integral part of comprehensive care, not an optional addition considered only if time permits.

Fill in the blank: Forensic evidence following sexual assault typically remains detectable for up to _____ hours, though this varies. Every survivor of sexual assault should be offered onward referral for psychological _____ as an integral part of care.

Step	Key Action
Consent-Based History	Obtain informed consent, take sensitive and non-judgmental history.
Forensic Examination	Conduct thorough physical exam, document findings carefully.
Sample Collection	Collect forensic specimens (swabs, clothing, blood) following chain of custody.
Pregnancy and Infection Prophylaxis	Provide emergency contraception, STI prophylaxis, HIV post-exposure prophylaxis.
Psychological Support Referral	Refer for counselling, mental health support, and ongoing care.

Box 5.4: Key steps in the clinical care pathway for a sexual assault survivor.

Pilot questions 5.4

1. Describe the principles of history taking from a survivor of sexual assault. (Linked to SLO 5.5)
2. Describe the key principles of physical examination following sexual assault. (Linked to SLO 5.5)
3. Describe the forensic and clinical investigations performed following sexual assault. (Linked to SLO 5.6)



4. Describe the prophylactic measures offered to a survivor of sexual assault. (Linked to SLO 5.6)
5. Discuss the physical, psychological, and emotional toll of rape. (Linked to SLO 5.6)

5.5 Domestic and Gender-Based Violence

5.5.1 Epidemiology and risk factors for domestic violence

Domestic violence affects individuals across all social, economic, religious, and educational backgrounds, though certain factors, including younger age, pregnancy, financial dependence, and social isolation, are associated with increased vulnerability, and while women are disproportionately affected as victims of intimate partner violence, men, children, and older or disabled family members can also be affected, both as direct victims and as witnesses whose own wellbeing is significantly impacted.

Recognised risk factors for escalating severity and lethality include previous strangulation (a particularly strong predictor of subsequent homicide), threats to kill, access to weapons, escalating frequency or severity of violence, and the victim's own expressed fear for their life, all of which should be specifically and directly asked about whenever domestic violence is suspected or disclosed, as they materially inform urgent safety planning.

Fill in the blank: Factors associated with increased vulnerability to domestic violence include younger age, pregnancy, and financial _____. A particularly strong predictor of subsequent homicide in domestic violence is a history of _____.

5.5.2 Healthcare implications and signs and symptoms of domestic violence

The healthcare implications of domestic violence are extensive, including direct physical injury, chronic pain syndromes, mental health conditions such as depression, anxiety, and post-traumatic stress disorder, adverse pregnancy outcomes when violence occurs during pregnancy, and substantially increased use of healthcare services overall, making routine enquiry about domestic violence, in appropriate and safe circumstances, a genuinely important element of holistic clinical care rather than an optional extra.

Signs and symptoms that should raise suspicion of domestic violence include injuries inconsistent with the explanation given, injuries at different stages of healing (suggesting repeated episodes), delayed presentation for treatment, a partner who is reluctant to leave the consultation or who repeatedly answers on the patient's behalf, and frequent attendance with vague or non-specific symptoms without an identifiable organic cause.

Fill in the blank: A pattern of injuries at different stages of _____ suggests repeated episodes of domestic violence. A partner who is reluctant to leave the consultation or repeatedly answers on the patient's _____ is a recognised warning sign.



5.5.3 Documentation in suspected domestic violence

Careful, objective documentation in suspected domestic violence should record the patient's own words describing the incident in quotation marks wherever possible, a detailed and precise description of any injuries (using body diagrams and photography with consent), and the clinician's own objective observations, explicitly separated from any interpretation or conclusion, as this record may later serve an important role in legal or protective proceedings.

Safety planning and referral should be offered to any patient in whom domestic violence is suspected or disclosed, including information about local support services and, with the patient's consent, referral to specialist domestic violence services or, where children are involved or the risk is judged serious, appropriate safeguarding referral, always respecting the patient's autonomy to make their own informed decisions about disclosure and next steps wherever immediate safety allows.

Fill in the blank: Documentation in suspected domestic violence should record the patient's own words in _____ wherever possible. Clinical observations should be explicitly separated from any _____ or conclusion.

Category	Key Points
Lethality Risk Factors	Previous strangulation, threats to kill, weapon access, escalating severity of violence, victim's expressed fear.
Clinical Warning Signs	Inconsistent explanation of injuries, injuries at different stages of healing, partner's reluctance or controlling presence during consultation.

Table 5.5: Risk factors for domestic violence lethality and recognised clinical warning signs.

Pilot questions 5.5

- Describe who is affected by domestic violence and the factors associated with increased vulnerability. (Linked to SLO 5.7)
- Describe the risk factors associated with escalating severity and lethality in domestic violence. (Linked to SLO 5.7)
- Describe the healthcare implications of domestic violence. (Linked to SLO 5.7)
- Describe the signs and symptoms that should raise suspicion of domestic violence. (Linked to SLO 5.8)
- Describe the principles of appropriate documentation in suspected domestic violence. (Linked to SLO 5.8)



Series Summary

This Series has covered medical ethics in gynaecology, from its historical origins through to the principles of informed consent, followed by forensic medicine, litigation, sick leave, and death certification. It went on to examine the legal and clinical aspects of abortion in Nigeria, then the care of survivors of sexual assault, before concluding with domestic and gender-based violence, its recognition, healthcare implications, and appropriate documentation, bringing this course on General Gynaecology to a close.

You should now be able to discuss the principles of medical ethics and informed consent, describe the forensic and medicolegal aspects of gynaecological practice, discuss the legal and clinical aspects of abortion in Nigeria, describe the care of survivors of sexual assault, and recognise and appropriately document domestic and gender-based violence (Linked to SLOs 5.1 to 5.8).

Glossary of Terms

1. **Autonomy:** the patient's right to make informed decisions about their own care, one of the four pillars of medical ethics.
2. **Confidentiality:** the ethical duty to protect patient information, not absolute and subject to justified exceptions.
3. **Forensic gynaecology:** the application of medical knowledge to legal questions arising in gynaecological practice.
4. **Informed consent:** consent given by a patient with capacity, adequate information, and voluntariness, without coercion.
5. **Maternal death:** death occurring during pregnancy or within 42 days of its end, from a cause related to or aggravated by the pregnancy.
6. **Postabortion care:** a standard of care encompassing treatment of complications, contraceptive counselling, and psychological support after any abortion, regardless of legal circumstances.
7. **Safeguarding referral:** referral to protective services made when a patient, particularly a child or vulnerable adult, is at risk of harm.



8. **Chain of custody:** the documented, unbroken process ensuring the integrity of forensic evidence from collection to legal use.
9. **Intimate partner violence:** domestic violence occurring between individuals in a current or former intimate relationship.
10. **Post-exposure prophylaxis:** medication given after potential exposure to HIV or other infections to reduce the risk of transmission.
11. **Death certificate part 1a:** the section of a death certificate recording the immediate cause of death.
12. **Lethality risk factors:** features such as previous strangulation or threats to kill that predict an increased risk of homicide in domestic violence.

Concept Check Questions [Series 5]

Objective questions

- Medical ethics traces its formal origins to the _____ Oath.
- Valid informed consent requires capacity, information, and _____.
- A maternal death is defined as occurring during pregnancy or within _____ days of its end.
- Nigerian law restricts abortion to circumstances where it is performed to preserve the _____ of the pregnant woman.
- A particularly strong predictor of subsequent homicide in domestic violence is a history of _____.

Short-answer questions

1. Explain the circumstances in which patient confidentiality may be justifiably breached. (Linked to SLO 5.1)
2. Describe the structure of a death certificate. (Linked to SLO 5.3)
3. Describe the components of postabortion care. (Linked to SLO 5.4)
4. Describe the key principles of physical examination following sexual assault. (Linked to SLO 5.5)



5. Describe the signs and symptoms that should raise suspicion of domestic violence. (Linked to SLO 5.8)

Long-answer questions

6. Describe the principles of medical ethics and informed consent in gynaecological practice. (Linked to SLO 5.1, SLO 5.2)
7. Describe the legal and clinical aspects of abortion and the management of its complications in Nigeria. (Linked to SLO 5.4)
8. Describe the approach to history taking and examination of a survivor of sexual assault. (Linked to SLO 5.5, SLO 5.6)
9. Discuss the physical, psychological, and emotional toll of rape and the support that should be offered. (Linked to SLO 5.6)
10. Describe the risk factors, healthcare implications, and appropriate documentation of domestic violence. (Linked to SLO 5.7, SLO 5.8)

Answers to Concept Check Questions [Series 5]

Objective questions

11. Hippocratic.
12. Voluntariness.
13. 42.
14. Life.
15. Strangulation.

Short-answer questions

16. Confidentiality may be breached where there is genuine risk of serious harm to the patient or a third party, or a legal requirement to disclose, applying minimum necessary disclosure.



17. Part 1a records the immediate cause, 1b and 1c antecedent causes, and part 2 other significant contributing conditions not directly causing death.
18. Treatment of complications, contraceptive counselling to prevent future unwanted pregnancy, and referral for psychological or social support where appropriate.
19. Explicit ongoing consent at every stage, systematic documentation of injury using body diagrams and photography, and continuous attention to survivor comfort and autonomy.
20. Injuries inconsistent with the explanation given, injuries at different healing stages, delayed presentation, and a partner reluctant to leave or answering for the patient.

Long-answer questions

21. **Basic response:** Medical ethics rests on the four pillars of autonomy, beneficence, non-maleficence, and justice, with informed consent requiring capacity, information, and voluntariness.

Value-added response: Confidentiality and consent carry particular sensitivity in gynaecological practice given the intersection with fertility, sexuality, and bodily autonomy.

22. **Basic response:** Nigerian law restricts abortion to preserving maternal life, resulting in unsafe abortion as a major contributor to maternal mortality, managed with standard emergency principles.

Value-added response: Postabortion care is a standard of care regardless of legal circumstances, reflecting the ethical obligation to treat separately from the legal restriction on the procedure itself.

23. **Basic response:** History and examination of a sexual assault survivor require a private, consent-based, non-judgemental approach, with systematic documentation of any injury.

Value-added response: The psychological toll of rape is profound and every survivor should be offered psychological support referral as an integral part of comprehensive care.

24. **Basic response:** Domestic violence affects individuals across all backgrounds, with risk factors including younger age, pregnancy, and financial dependence, and significant healthcare implications.

Value-added response: Careful documentation using the patient's own words, separated from clinical interpretation, is essential given its potential role in later legal or protective proceedings.



Answers to Pilot Questions [Series 5]

Part 5.1

1. The Hippocratic Oath, later shaped by documented historical research abuses that prompted formal ethical codes and research ethics review.
2. Advances such as assisted reproduction, prenatal diagnosis, and expanding surgical capability have raised new ethical questions not anticipated by earlier frameworks.
3. Autonomy, beneficence, non-maleficence, and justice.
4. Where there is genuine risk of serious harm to the patient or a third party, or a legal requirement to disclose.
5. Capacity to decide, adequate information about the intervention, and voluntary, uncoerced agreement.

Part 5.2

6. Records may later form central evidence in legal proceedings, making accuracy and completeness at the time of examination essential.
7. Failure to obtain adequate informed consent, delayed diagnosis of malignancy or ectopic pregnancy, and surgical complications.
8. The certifying doctor must have personally assessed the patient and certify only the period of incapacity genuinely supported by clinical findings.
9. Part 1a records the immediate cause, 1b and 1c antecedent causes, and part 2 other significant contributing conditions.
10. A maternal death occurs during pregnancy or within 42 days of its end from a pregnancy-related cause, essential for accurate mortality surveillance.

Part 5.3

11. Nigerian law restricts abortion to preserving the life of the pregnant woman, a more restrictive framework than many other countries.
12. The ethical duty to treat and the legal restriction on performing the procedure are separate considerations that should never be conflated.



13. Expectant, medical (misoprostol), or surgical management, chosen by gestational age, clinical stability, and patient preference.
14. Treatment of complications, contraceptive counselling, and referral for psychological or social support where appropriate.
15. Haemorrhage, sepsis, uterine perforation, and visceral injury, managed with resuscitation, antibiotics, and evacuation or surgical repair as needed.

Part 5.4

1. A private, unhurried, non-judgemental setting, avoiding leading questions, with explicit reassurance that the survivor controls what is shared.
2. Explicit ongoing consent, systematic documentation of injury, and continuous attention to the survivor's comfort and autonomy throughout.
3. Forensic sample collection following a validated protocol, pregnancy testing, sexually transmitted infection screening, and baseline bloods.
4. Emergency contraception and post-exposure prophylaxis for HIV and other infections, offered as clinically indicated.
5. Acute traumatic stress, longer-term post-traumatic stress disorder, depression, anxiety, and substantial disruption to daily life and relationships.

Part 5.5

1. All social, economic, religious, and educational backgrounds, with younger age, pregnancy, and financial dependence increasing vulnerability.
2. Previous strangulation, threats to kill, weapon access, escalating severity, and the victim's own expressed fear for their life.
3. Physical injury, chronic pain, mental health conditions, adverse pregnancy outcomes, and increased healthcare service use overall.
4. Injuries inconsistent with explanation, injuries at different healing stages, delayed presentation, and a reluctant or overly present partner.
5. Recording the patient's own words in quotation marks, detailed injury description, and clinical observations kept separate from interpretation.



References and Attributions [Series 5]

Textual References

6. Hoffman, B. L., Schorge, J. O., Halvorson, L. M. et al. (2020). Williams Gynecology (4th ed.). McGraw Hill.
7. General Medical Council (2020). Confidentiality: Good Practice in Handling Patient Information. GMC.
8. World Health Organization (2013). Responding to Intimate Partner Violence and Sexual Violence against Women: WHO Clinical and Policy Guidelines. WHO Press.
9. Faculty of Forensic and Legal Medicine (2020). Recommendations for the Collection of Forensic Specimens from Complainants and Suspects. FFLM.

Figures, Plates, Tables, and Boxes

1. Box 5.1: The four pillars of medical ethics and the elements of valid informed consent. AI-generated using the prompt: "Create a simple single-column reference box with an outside border titled Four Pillars of Medical Ethics and Elements of Consent, listing each principle with a one-line definition. Clinical reference box style."
2. Table 5.2: Structure of the death certificate and its component parts. AI-generated using the prompt: "Create a clean reference table titled Structure of the Death Certificate, showing parts 1a, 1b, 1c, and 2 with a brief example for each. Simple clinical reference table style with outside border."
3. Figure 5.3: Complications of unsafe abortion and their emergency management pathway. AI-generated using the prompt: "Create a professional medical diagram titled Complications of Unsafe Abortion and Emergency Management, showing complications branching to their emergency management steps. Clean clinical educational diagram style."
4. Box 5.4: Key steps in the clinical care pathway for a sexual assault survivor. AI-generated using the prompt: "Create a simple single-column reference box with an outside border titled Care Pathway for a Sexual Assault Survivor, listing key steps from history through to psychological support referral. Clinical reference box style."
5. Table 5.5: Risk factors for domestic violence lethality and recognised clinical warning signs. AI-generated using the prompt: "Create a clean reference table titled Domestic



Violence Risk Factors and Clinical Warning Signs, listing lethality risk factors and warning signs seen in clinical encounters. Simple clinical reference table style with outside border."

