

Female Pelvis

Reproductive Block

Color Index

Main Text

Male's Slides

Female's Slides


Important


Doctor's Notes


Extra Info


[The Editing File](#) 


Objectives

 Describe the anatomy of the **pelvic wall, bones, joints & muscle.**

 Describe the **boundaries and subdivisions of the pelvis.**

 Differentiate the different **types of the female pelvis.**

 Describe the **components & function of the pelvic diaphragm.**

 List the **arterial & nerve supply and the lymph & venous drainage of the pelvis.**

This lecture was presented by :

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We recommend you watch these 2 videos:
[Vid1](#) & [Vid2](#)



[You can find more quizzes by Clicking HERE!](#)

★ **Special Thanks to Saleh Aljanah and Abdulaziz Alqarni!**



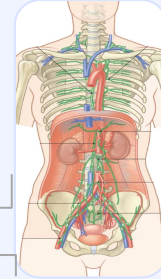
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The pelvis

1

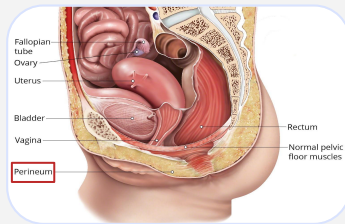
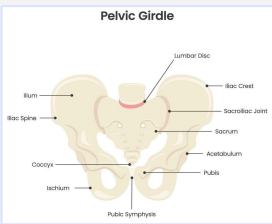
The most inferior part of the trunk



Trunk

Pelvis

Pelvic Girdle

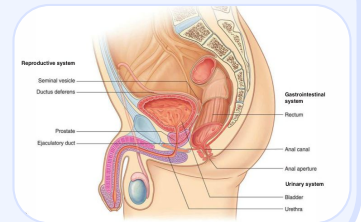
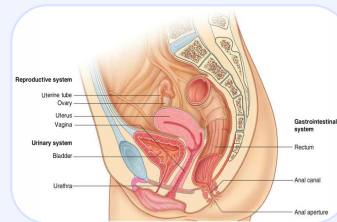


It consists of the pelvic Girdle & perineum

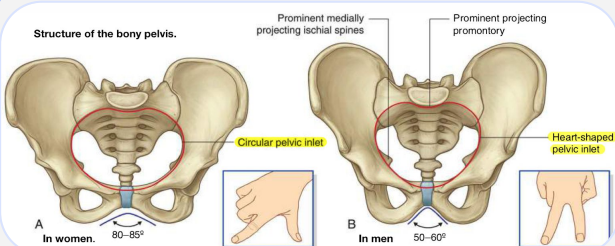
2

3

Supports the urinary & Reproductive organs



Structure of the bony pelvis.



The female pelvis is broader and larger than the male pelvis Why?

To provide a comfortable environment for fetus development.

4

The pelvis

Bony pelvis is composed of 4 bones:

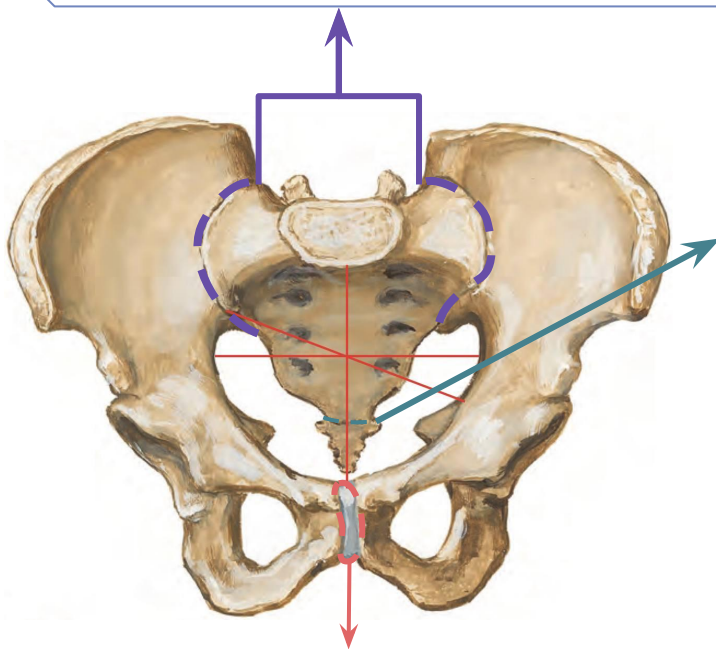
2 Hip bones	Which form the anterior & lateral walls.	<ul style="list-style-type: none"> ▶ These 4 bones are connected by 4 joints & lined by 4 muscles. ▶ The bony pelvis with its joints & muscles form a strong basin-shaped شكل الحوض structure (with multiple foramina). To allow passage of structures from pelvis to lower limbs ▶ The pelvis contains and protects: <ol style="list-style-type: none"> 1- Lower parts of the Alimentary tract 2- Urinary tracts 3- Internal organs of reproduction
Sacrum	Which form the posterior wall.	
Coccyx		

Pelvic joints

1- Posterolaterally:

2 Sacroiliac joints. (Synovial joints)

- ↳ Lies between the sacrum & ilium, which are connected by strong ligaments.
- ↳ The joint is strong, supporting the entire weight of the upper body.
- ↳ In humans, the sacrum supports the spine, and it is supported in turn by an ilium on each side.
- ↳ Has irregular elevations & depressions that produce interlocking of the 2 bones



2- Posteriorly:

Sacrococcygeal joint. (Cartilaginous joint)

- Formed between:
 - Oval surface at the apex of the sacrum
 - Base of the coccyx.
- Slightly moveable joint
- Frequently / partially / completely obliterated in old age. eg: Joints between bodies of vertebrae

3- Anteriorly:

Symphysis Pubis. (Secondary Cartilaginous joint)

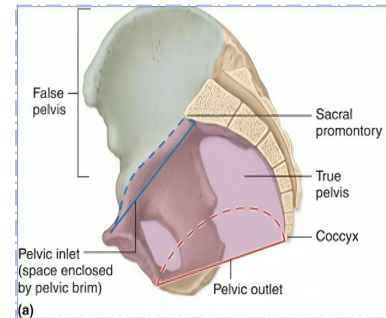
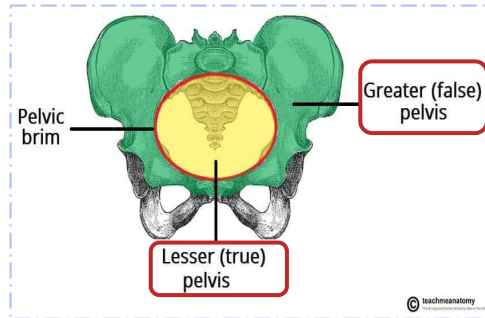
- Lies:
- Between the left & right superior rami of pubis of the hip bones
 - Front of & below the urinary bladder.

Pelvic Brim

The pelvis is divided into 2 parts by the pelvic brim (inlet):

1 True / Lesser pelvis

2 False / Greater pelvis



True / Lesser pelvis

It's located below the brim

Has 3 parts: 1- Inlet 2- Cavity 3- Outlet

- ▶ The Cavity is a short, curved canal, with a shallow anterior wall and a deeper posterior wall.
- ▶ It lies between the inlet and the outlet.

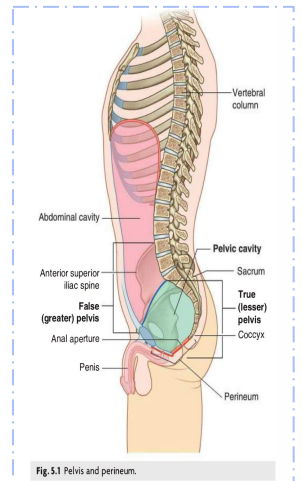
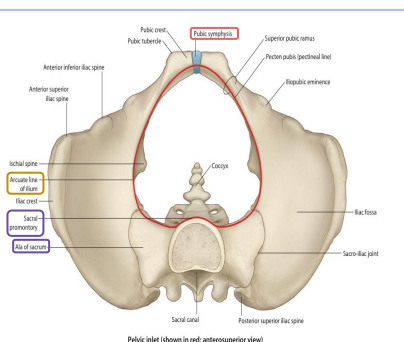


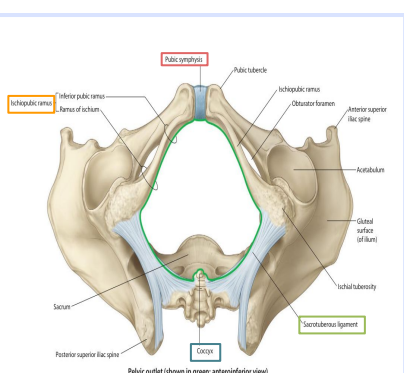
Fig. 5.1 Pelvis and perineum.

Pelvic inlet	Anteriorly	Symphysis pubis. (upper border)
	Posteriorly	Promontory & ala of sacrum. Promontory it's an anterior projection of the first sacrum vertebrae
	Laterally	Iliopectineal (arcuate) lines.



Pelvic inlet (shown in red; anterosuperior view)

Pelvic Outlet (Diamond shaped)	Anteriorly	Symphysis pubis. (Lower border)
	Posteriorly	Coccyx.
	Anterolaterally	Ischiopubic ramus
	Posterolaterally	Sacrospinous ligament



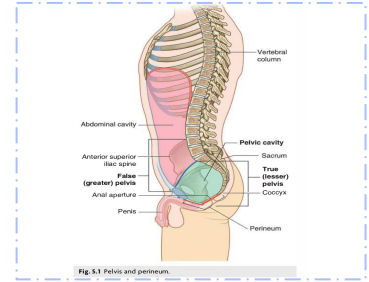
Pelvic outlet (shown in green; anterosuperior view)

False / Greater pelvis

It's located Above the brim.

It's part of the abdominal cavity.

False: Not used during delivery process
Greater : Larger in size



The false pelvis is bounded by:

Anteriorly	<ul style="list-style-type: none"> » Lower part of the anterior abdominal wall » It supports the lower abdominal contents.
Posteriorly	Lumbar vertebrae
Laterally	Iliac fossae & the iliacus muscle

Female pelvis

All of these help in delivery process

The **Sacrum** is usually wider and shorter.
(To protect the fetus.)

- The **Angle** of the pubic arch is wider. **clinical importance:** It is important in the growth and delivery of the baby.
- The **promontory** and the **ischial spines** are less projecting (*everted*) **طالعة للخارج**.
- **Circular / oval shaped inlet.**

Male pelvis

The **Sacrum** is usually longer, narrowest and curved.

- The promontory and the ischial spines are more projecting (*inverted*) **داخلة لجوة**.
- The Angle of the pubic arch is acute **ضيقة**.
- **Heart shaped inlet.**

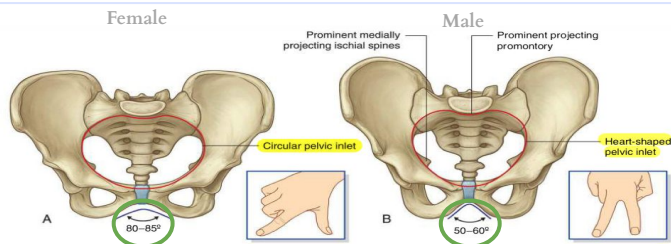
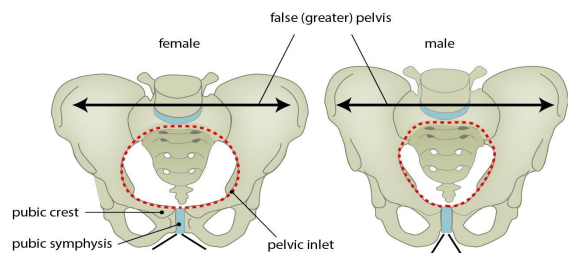
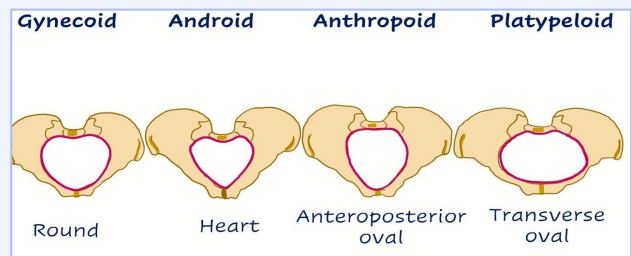
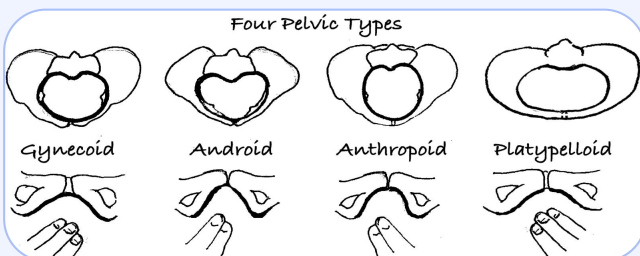


Fig. 5.27 Structure of the bony pelvis. A. In women. B. In men. The angle formed by the pubic arch can be approximated by the angle between the thumb and index finger for women and the angle between the index finger and middle finger for men as shown in the insets.



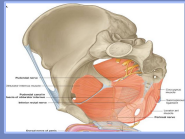
Types of the Female Pelvis

Information of the shape and dimensions of the female pelvis is of **great importance for obstetrics** because it is the **bony canal through which the child passes during birth.**



Pelvic walls

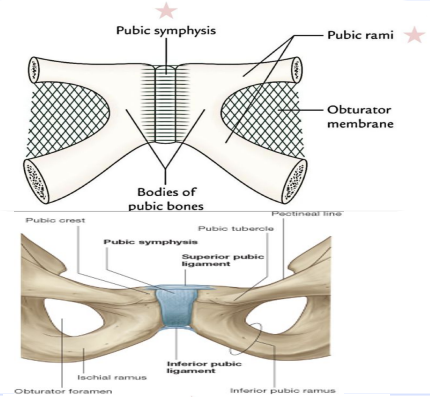
4 Walls formed by bones & ligaments, lined with muscles covered with fascia & parietal peritoneum



Anterior pelvic wall (Very narrow)

The shallowest wall **with no muscles**.
Formed by:

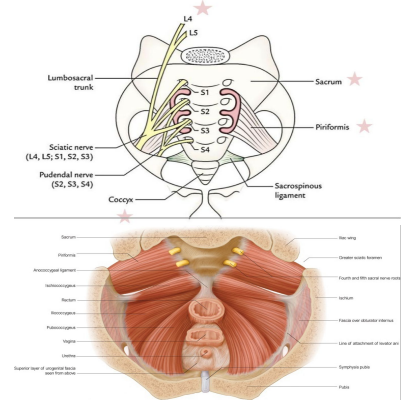
- Posterior surface of the bodies of the pubic bones
- Pubic rami
- Symphysis pubis



Posterior pelvic wall (Deep wide)

Large and **deeper than the anterior wall**.
Formed by:

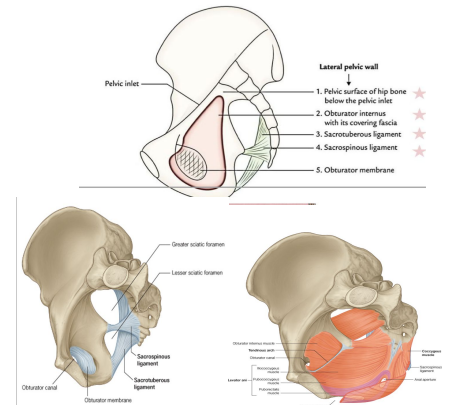
- Sacrum.
- Coccyx.
- **Piriformis muscles** and their covering of parietal pelvic fascia.



Lateral pelvic wall

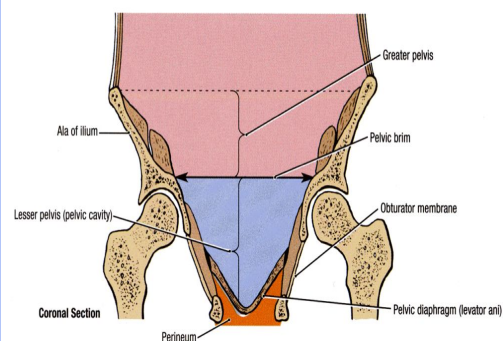
Formed by:

- Part of the **hip bone** below the pelvic inlet.
- **Obturator internus** and its **obturator fascia (The covering)**
- **Sacrotuberous** ligament
- **Sacrospinous** ligament



Inferior pelvic wall (Pelvic floor)

- Basin-like (👉) structure.
- Supports the pelvic viscera.
- Formed by the **pelvic diaphragm**
- Stretches across **the lower part of the true pelvis** and **divides it into**:
 - ▶ **Main (true) pelvic cavity above**, which contains the pelvic viscera.
 - ▶ **Perineum below**: Carries the external genital organs.



Pelvic Muscles (4 Muscles)

1

Piriformis
(part of posterior pelvic wall)

2

Obturator Internus
(part of lateral pelvic wall)

3

Levator Ani
(wide thin sheet-like muscle pelvic wall)
that has a linear origin

4

Coccygeus
(small triangular muscle)

Muscle	Piriformis ★	Obturator Internus ★
Origin	Pelvic surface of the middle 3 sacral vertebrae.	Inner surface of the obturator membrane and the hip bone.
Exit	It leaves the pelvis through the greater sciatic foramen.	It leaves the pelvis through the lesser sciatic foramen
Insertion	Greater trochanter of the femur.	
Nerve supply	Sacral plexus.	Nerve to obturator internus. (from sacral plexus)
Action	Lateral rotator of the femur at the hip joint.	

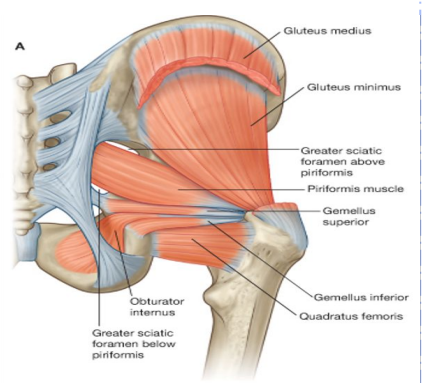
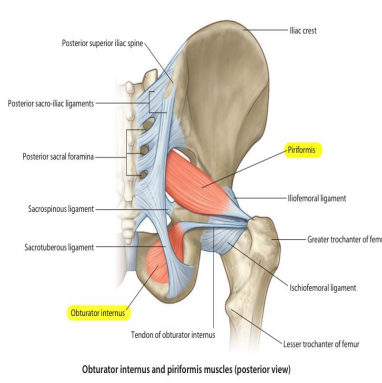
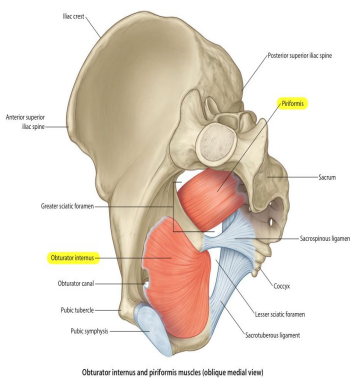
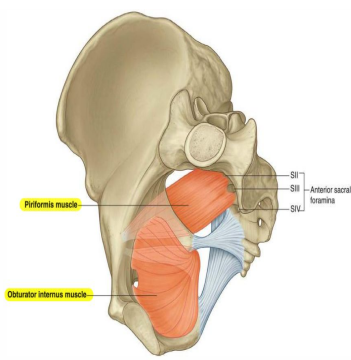
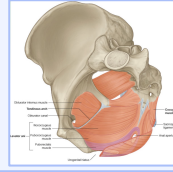


Fig. 530 Obturator internus and piriformis muscles (medial view of right side of pelvis).

Pelvic Diaphragm

Pelvic Diaphragm

- It is **formed** by the **levator ani** and the **coccygeus** muscles with their covering fasciae.
- It is **incomplete anteriorly** to allow passage of:
 - Urethra in males.
 - Urethra and vagina in females.



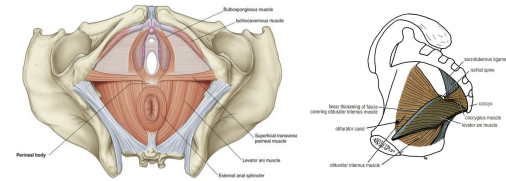
Female Dr said : according to the last edition of snell's textbook, I will change these fibers and resend the slides to you, here are the changes :

- Anterior compartment of levator ani:
 - Levator prostate (in males)
 - Pubovaginalis (in females)
- Intermediate compartment:
 - Puborectalis
 - Pubococcygeus
- Iliococcygeus (posterior compartment)

Levatores Ani Muscle 'It is a wide thin sheet-like muscle'

Origin

- Back of the body of the **pubis**.
- Tendinous arch of the **obturator fascia**.
- Spine of the **ischium**.



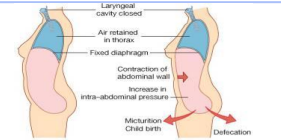
Fibers*

- Pubococcygeus.**
- Puborectalis**
- Iliococcygeus.**

Nerve Supply

- Perineal branch of the **4th sacral nerve**.
- Perineal branch of the **puddental nerve**.

- it's a part of pubococcygeus
- around the rectum .



Actions

- The muscles of the two sides form an efficient muscular sling that **supports and maintains the pelvic viscera in position**.
- They **resist the rise in intra pelvic pressure during the straining** and expulsive efforts of the **abdominal muscles** (as in **coughing**).
- They have a very important role in maintaining **fecal continence**.
- They serve as a **vaginal sphincter** in the female.

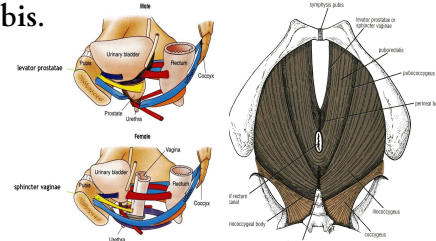
Levatores Ani Muscle (Fibers)*

Anterior Fibers

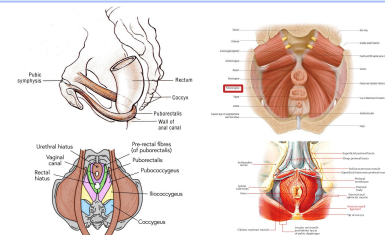
- Levator prostate (in males).
- Pubovaginalis (in females).

Intermediate Part

- Pubococcygeus:**
Origin: originates from the posterior surface of the body of the **pubis**.
Insertion: inserted into the **perineal body** and **coccyx**.
Actions:
 - Supports the **prostate** (or constricts the **vagina**).
 - Stabilizes the **perineal body**.
 - Forms a **sling** around the **prostate** or the **vagina**.



- Puborectalis:**
 - Forms a **sling** around the **recto-anal Junction**.**It has a very important role in maintaining fecal continence**

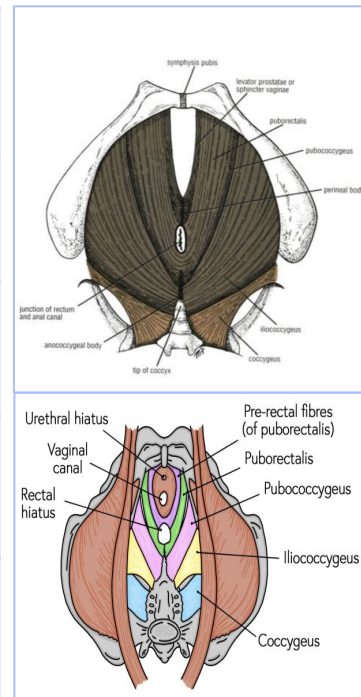


Posterior Part

- Iliococcygeus:**
Insertion: Inserted into the **anococcygeal body** and the **coccyx**.

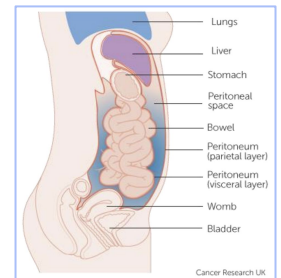
Pelvic Diaphragm

Coccygeus Muscle 'Small triangle muscle'	
Origin	Ischial spine.
Insertion	Lower end of sacrum and coccyx.
Nerve Supply	Branches of the 4th and 5th sacral nerves.
Action	Assist the levator ani in supporting the pelvic viscera.



Pelvic Peritoneum

Male
Slides



The peritoneum is a connective tissue membrane which lines the abdominal cavity and covers the abdominal organs (viscera).

Function: It acts to support the viscera and provides a pathway for blood vessels and lymph.

It consists of two layers which are continuous with each other:

1- Parietal Peritoneum: Lines the internal surface of the abdominopelvic wall.

2- Visceral Peritoneum: Covers the majority of the abdominal viscera.

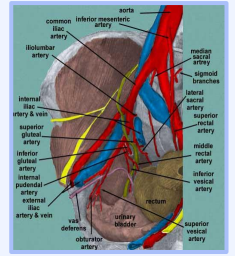
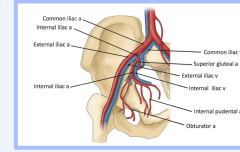
They both consist of a layer of simple squamous epithelial cells, called mesothelium.

Supply of the Pelvis

1 Internal Iliac Artery:

➔ One of the two terminal branches of the **common iliac artery**.
that come from abdominal aorta.

➔ **Course:** Arises in front of the **sacroiliac joint** → It descends downward & backwards **over the pelvic inlet** → It divides at the upper border of the greater sciatic foramen into **anterior** and **posterior** divisions.



Internal Iliac Artery

Posterior division	Parietal branches	<ol style="list-style-type: none"> 1. Iliolumbar artery. 2. Lateral sacral arteries (2 branches). 3. Superior gluteal artery. 	Supplies: <ol style="list-style-type: none"> 1. Posterior abdominal wall. 2. Posterior pelvic wall. 3. Gluteal region.
Anterior division	Parietal branches From the <u>anterior division</u>	<ol style="list-style-type: none"> 1. Obturator artery. 2. Inferior gluteal artery. 	
<small>Give supply to the organs</small>	Visceral branches	<ol style="list-style-type: none"> 1. Umbilical artery: Gives the superior vesical artery, the distal part of this artery fibrosed and forms the Medial Umbilical Ligament. 2. Inferior Vesical artery in male (or vaginal artery in female): in the male it supplies, the prostate and the seminal vesicles. It also gives the artery of the vas deferens. 3. Middle rectal artery. 4. Internal pudendal artery: it is the main arterial supply to the perineum. 	Supplies: <ul style="list-style-type: none"> - Gluteal region. - Perineum. - Pelvic viscera. - Medial (adductor) region of thigh. - The fetus (through the umbilical arteries).
	Visceral branches in (female)	<ol style="list-style-type: none"> 1. Vaginal artery: replaces the inferior vesical artery. 2. Uterine artery: crosses the Ureter superiorly and supplies the uterus & uterine tubes. 	<p>"water under the bridge"</p>

2 Ovarian artery

➔ (Visceral Branch in female): arises from the **abdominal aorta**.

Abdominal aorta give gonadal artery , if it's a female we call it (ovarian A.) if male (artery to the testis)

Supply of the Pelvis

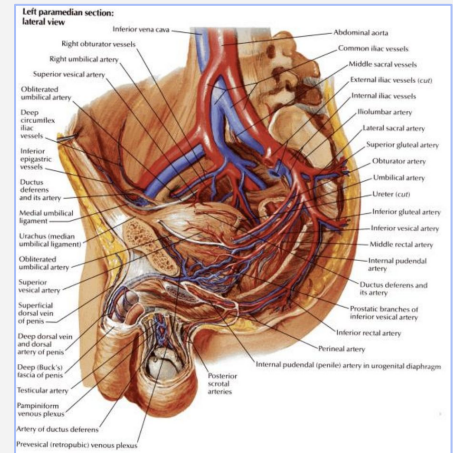
1 Venous drainage

1. Internal Iliac Veins

- It collect tributaries corresponding to the **branches** of the **internal iliac artery**.
- joins the **external iliac vein** in front of the sacroiliac joint to form the **common iliac vein**.

2. Ovarian Vein

- **Right vein drains into IVC.**
- **Left vein drains into left renal Vein.**



2 Lymphatic drainage

- The lymph nodes and vessels are **arranged in a chain along the main blood vessels**.
- Thus, there are:
 - 1-external iliac nodes
 - 2-internal iliac nodes
 - 3-common iliac nodes.
- **Lymph from Common iliac nodes and the (ovaries, uterine tubes and fundus of uterus) passes to lateral aortic (paraaortic) nodes.**

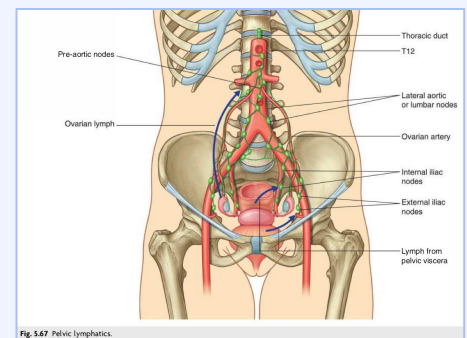


Fig. 547 Pelvic lymphatics.

3 Nerve supply

Somatic:

- Sacral plexus.

Autonomic:

1. Sympathetic (Pelvic part of sympathetic trunk):

- The two sympathetic trunks unite inferiorly in front of the coccyx and form a single ganglion (**Ganglion Impar**).
- Superior & Inferior Hypogastric plexuses.

2. Parasympathetic:

- Pelvic splanchnic nerves (From S2, S3, S4)

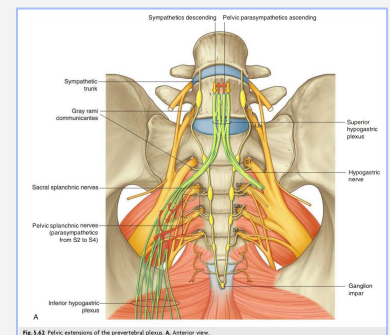
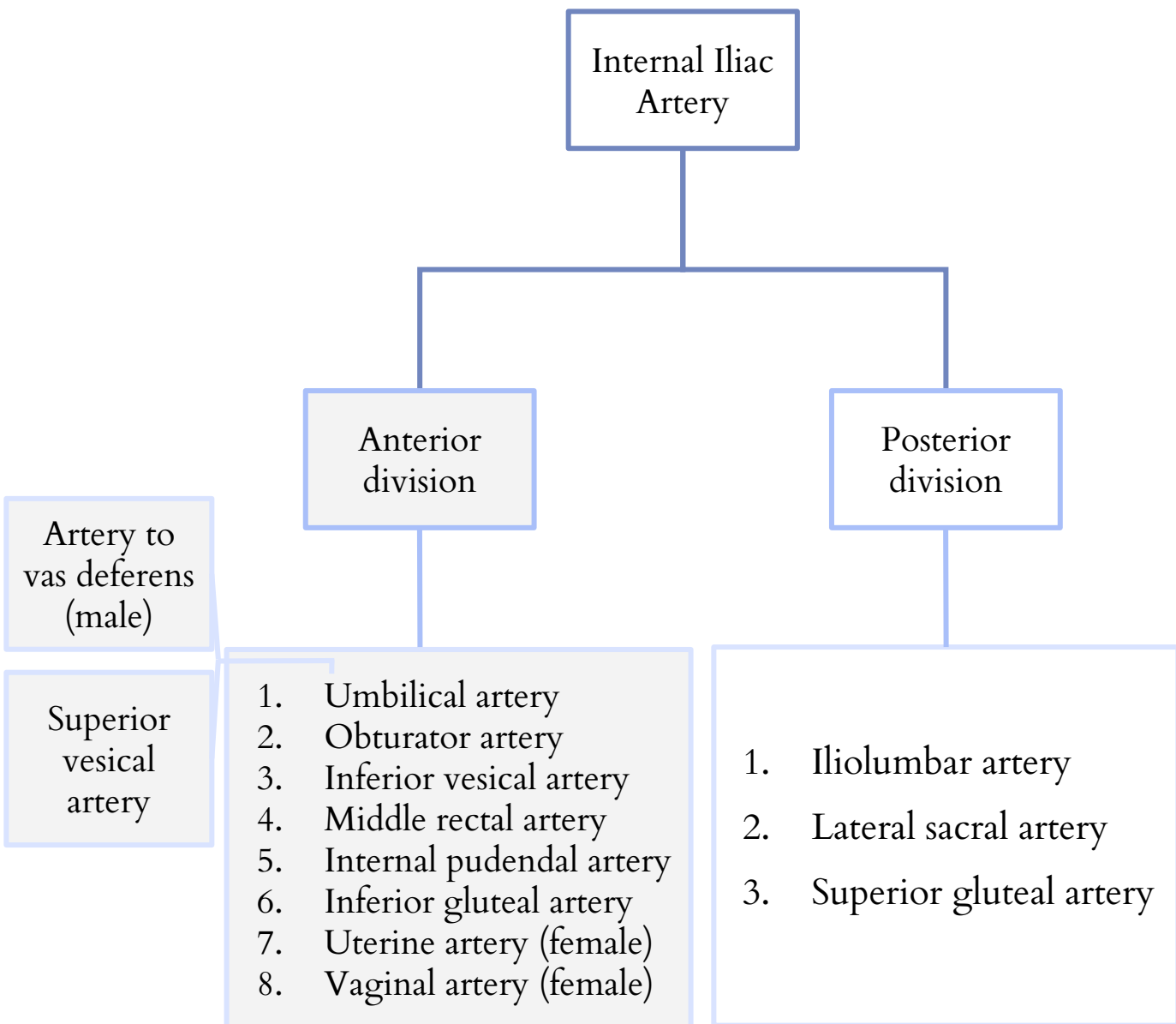


Fig. 543 Pelvic extensions of the prevertebral plexus. A. Anterior view.

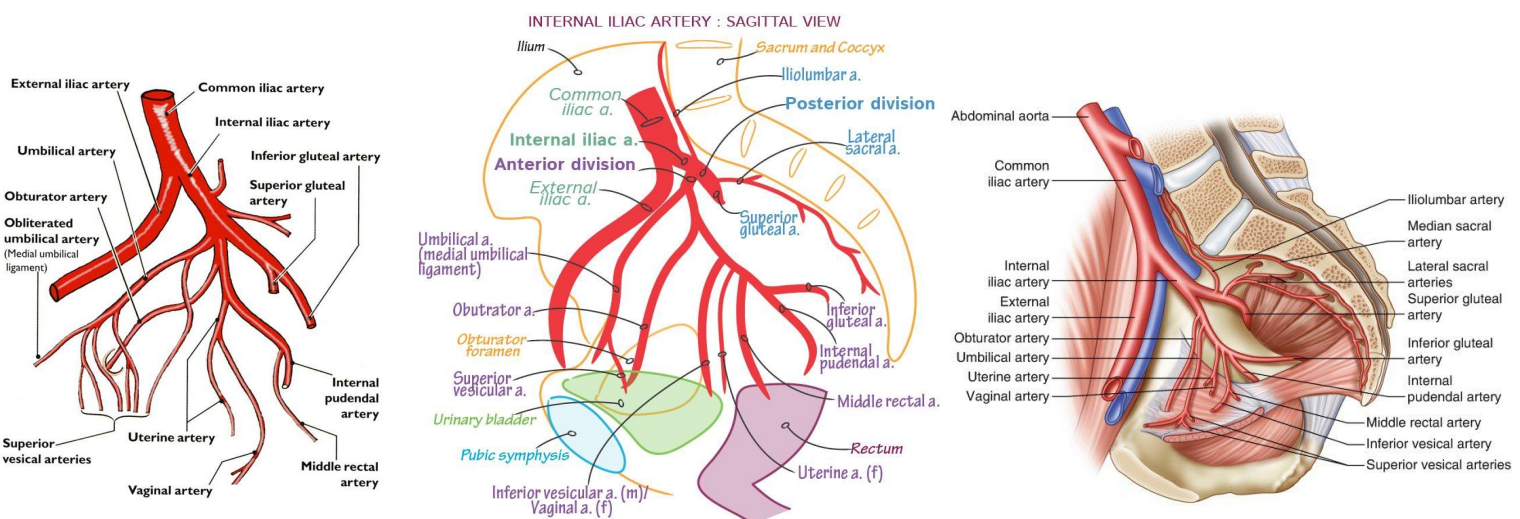
Supply of the Pelvis

Branches of the internal iliac artery

Extra

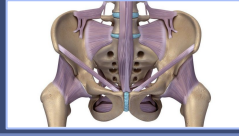


Helpful pictures



Male Dr: just for your knowledge

1. Pelvic Dysfunction



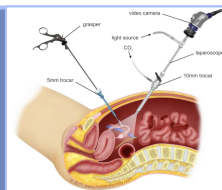
- Pelvic floor dysfunction refers to a range of signs and symptoms that related to abnormal functioning of the pelvic floor muscles.
- In **women**, the pelvic floor muscles support the **urethra, vagina, and anal canal**.
- The **weakening** of these muscles can result in a **loss of structural support to these organs**.

Symptoms:

1. Urinary incontinence.
2. Fecal incontinence.
3. Genitourinary prolapse.
4. Pelvic pain.
5. Sexual dysfunction.

- The **causes** of pelvic floor dysfunction are understood to be multifactorial and include:
obstetric trauma / increasing age / obesity / chronic straining.

2. Hysterectomy



It is the **surgical removal of the uterus**. It has a number of possible indications. The following are the most **common**, but this is not an exhaustive list:

1. Heavy menstrual bleeding.
2. Pelvic pain.
3. Uterine prolapse (vaginal hysterectomy).
4. Gynaecological malignancy (usually ovarian, uterine or cervical).
5. Risk reducing surgery, usually in cases of BRCA 1 or 2 mutations, or Lynch syndrome.

When performing a **hysterectomy**, a good knowledge of **regional anatomy** is needed to **prevent accidentally damaging other structures in the pelvic region**.

MCQs

Q1-Sacrum usually in females is:

A- wider and longer.

B- wider and shorter

C-Narrower and longer

D-Narrower and shorter

Q2-Obturator internus muscle leaves the pelvis through ?

A- Lesser sciatic foramen

B- Greater sciatic foramen

C- Greater trochanter

D- Obturator foramen

Q3- The ovarian artery originated from which artery?

A- Uterine Artery

B- Vaginal Artery

C- Abdominal Artery

D- Internal Iliac Artery

Q4- Which one of the following muscles forms the greater part of pelvic diaphragm?

A- Levator Ani

B- Obturator Internus

C- Piriformis

D- Sphincter Ani Externus

Q5- In females, which artery replaces the inferior vesical artery?

A- Vaginal Artery

B-Uterine Artery

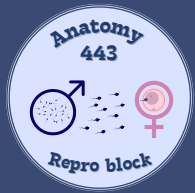
C- Pudendal Artery

D-Superior Vesical Artery

Answers: 1-B 2-A 3-C 4-A 5-A

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