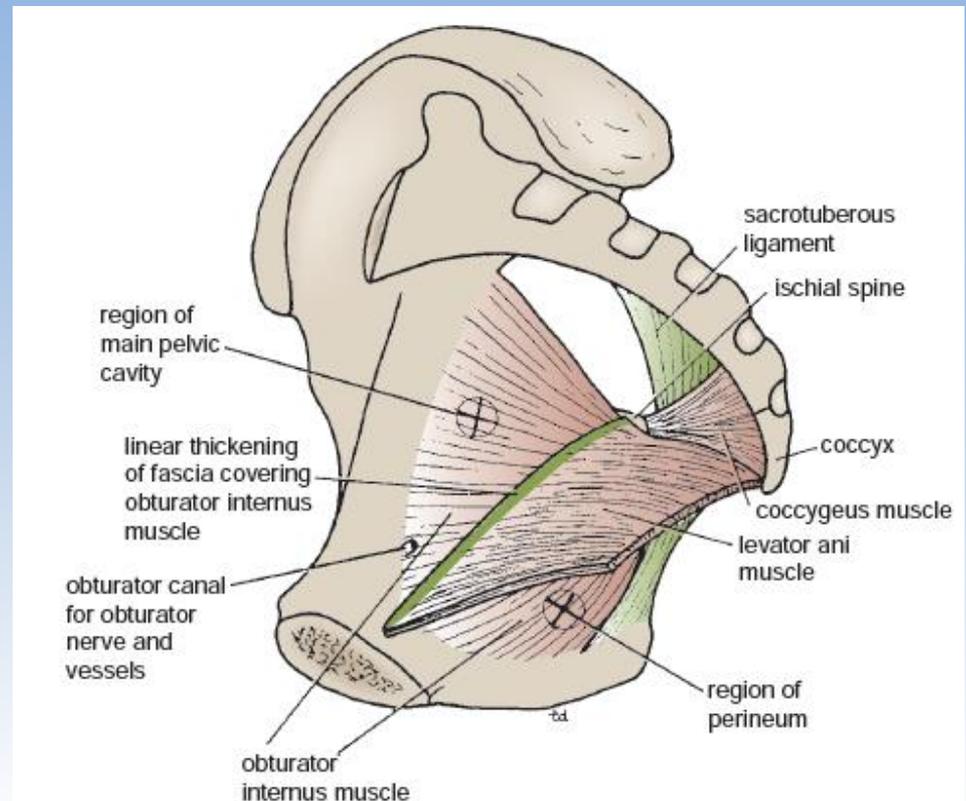
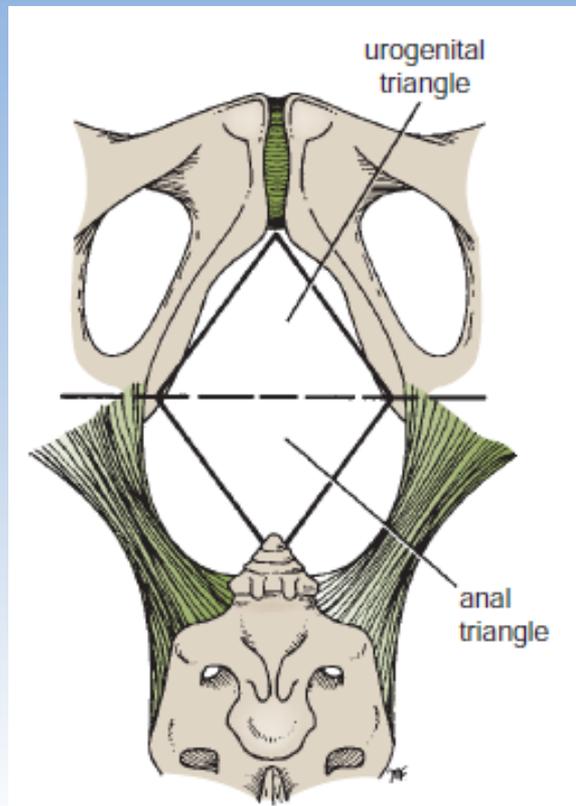


# Períneum

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College of Medicine.  
University of Anbar.*

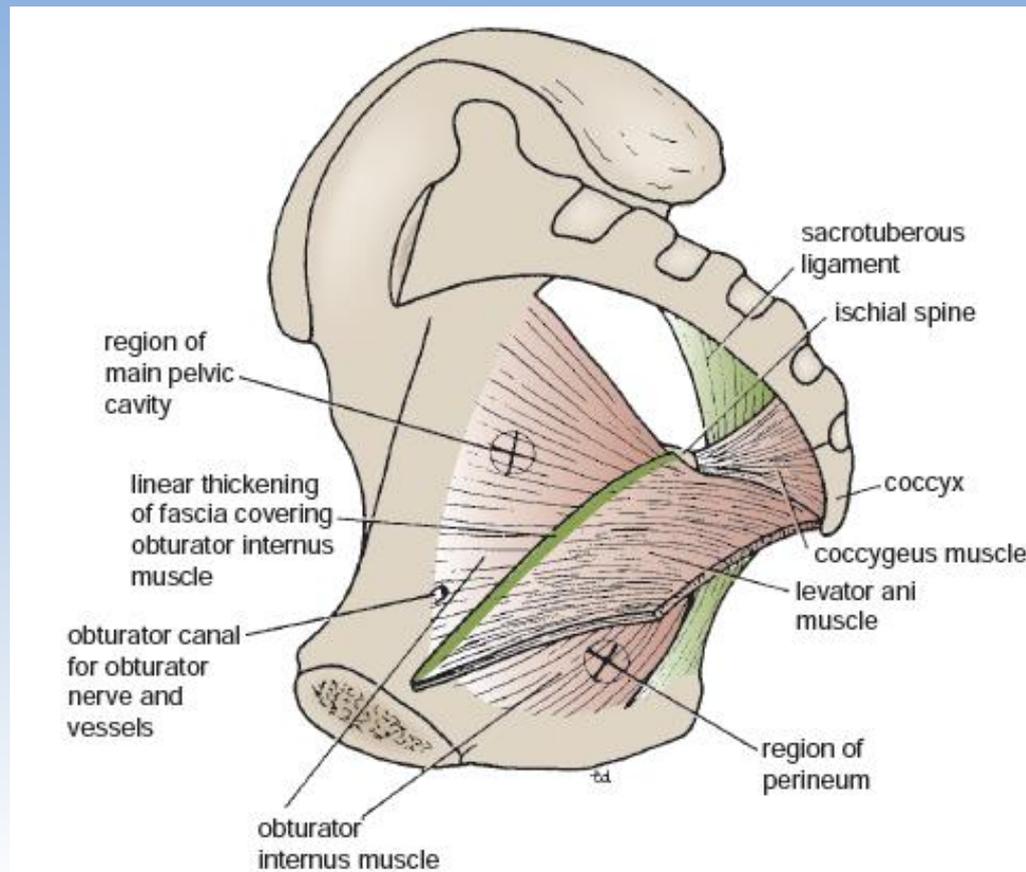
## Definition of Perineum

- The cavity of the pelvis is divided by the pelvic diaphragm into the **main pelvic cavity** above and the **perineum** below.
- When seen from below with the thighs abducted, the perineum is **diamond shaped** and is bounded anteriorly by the **symphysis pubis**, posteriorly by the tip of the **coccyx**, and laterally by the **ischial tuberosities**.



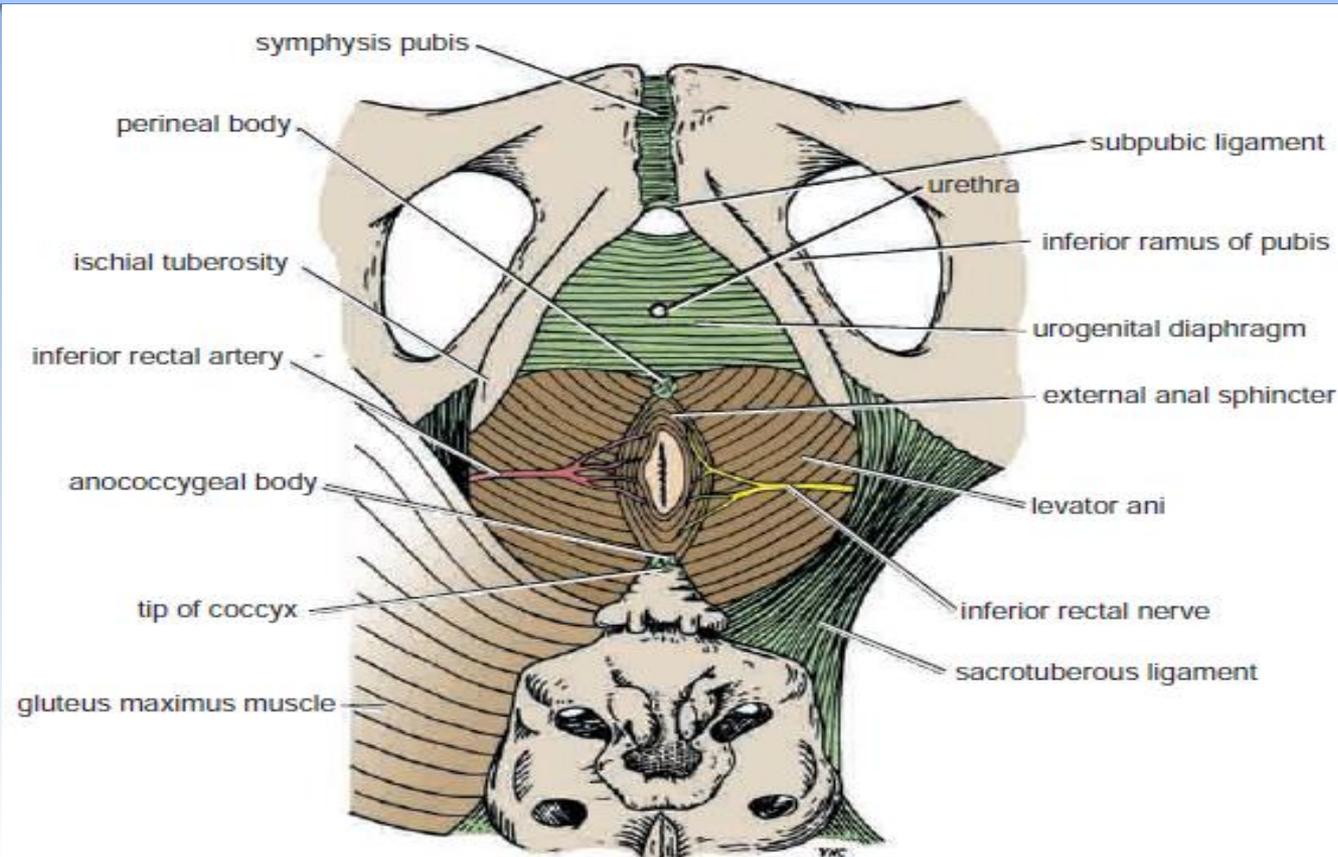
# Pelvic Diaphragm

- The pelvic diaphragm is formed by the important **levatores ani** muscles and the small **coccygeus** muscles and their **covering fasciae**.
- It is incomplete anteriorly to allow passage of the urethra in males and the urethra and the vagina in females.



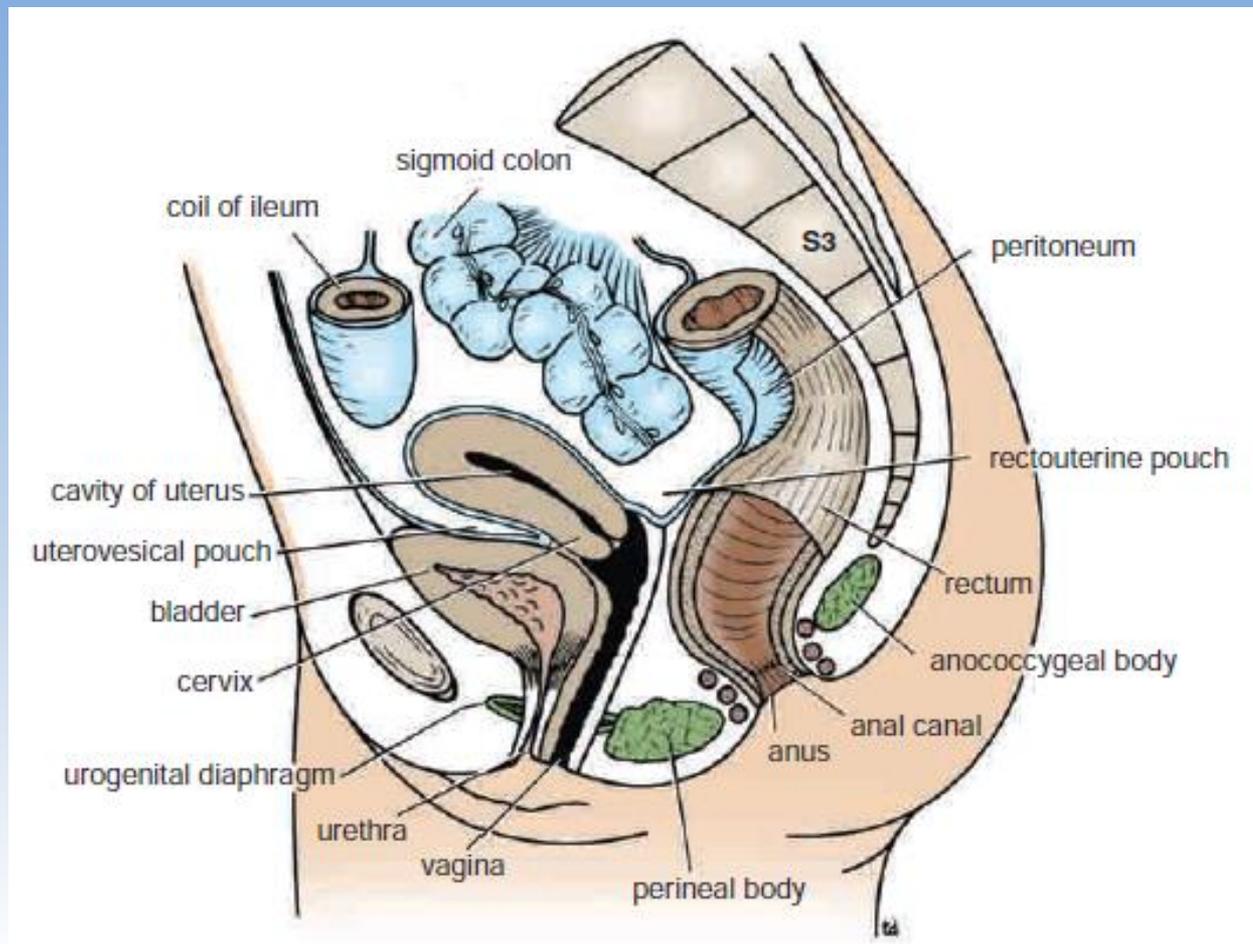
# Contents of Anal Triangle

- The anal triangle is bounded behind by the tip of the **coccyx** and on each side by the **ischial tuberosity** and the **sacrospinous ligament**, overlapped by the border of the gluteus maximus muscle.
- The **anus**, or lower opening of the anal canal, lies in the midline, and on each side is the ischioanal fossa. The skin around the anus is supplied by the inferior rectal (hemorrhoidal) nerve.
- The lymph vessels of the skin drain into the medial group of the superficial inguinal nodes.



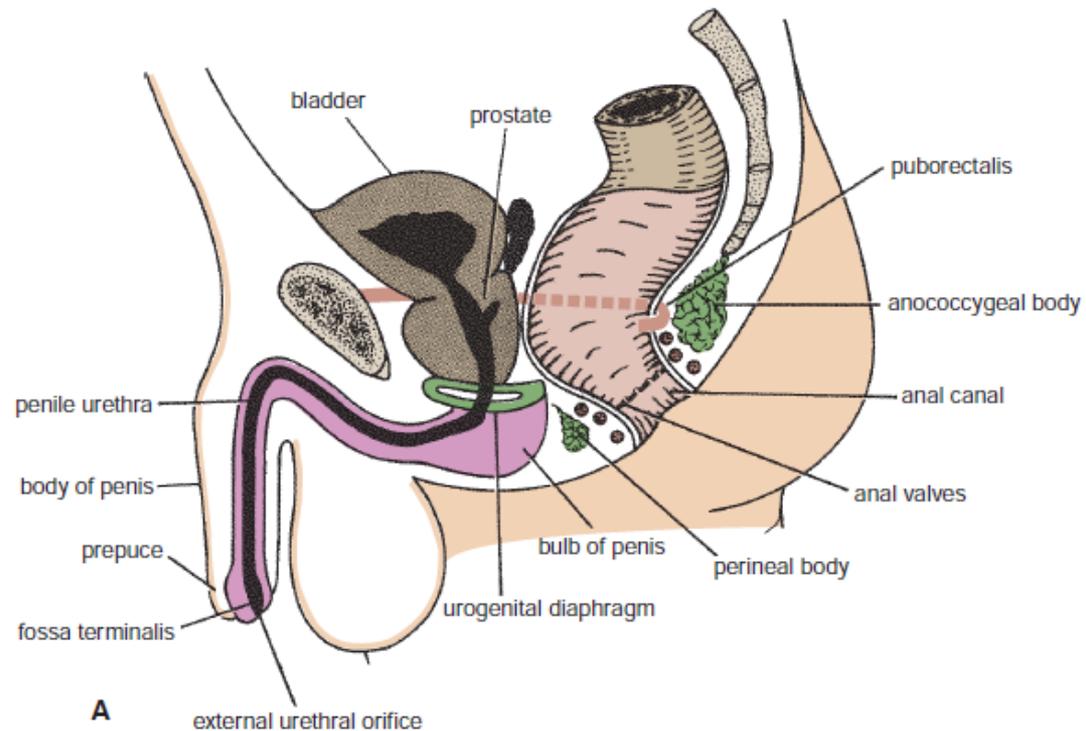
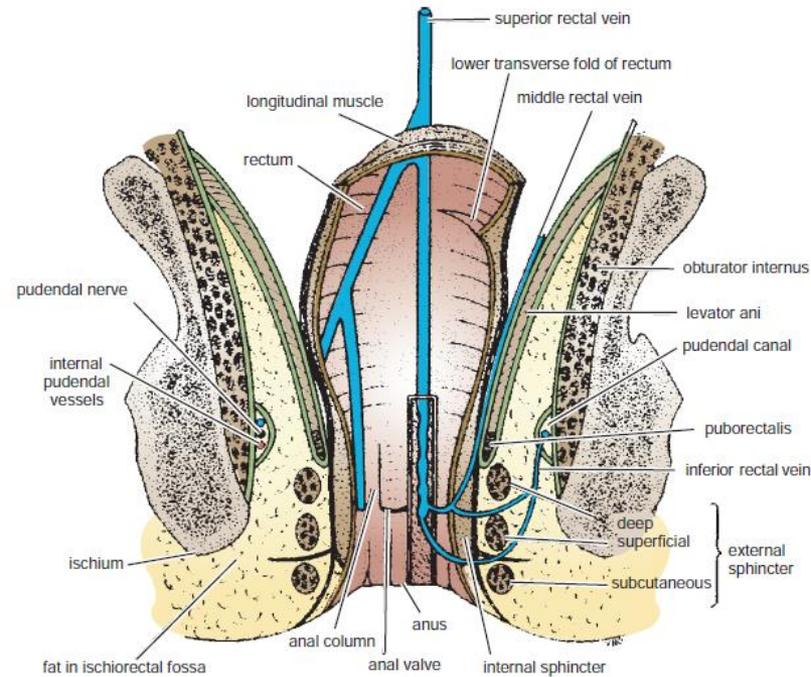
# Anal Canal

- The anal canal is about 4 cm long and passes downward and backward from the rectal ampulla to the anus.
- Except during defecation, its lateral walls are kept in apposition by the levatores ani muscles and the anal sphincters.



# Relations of the Anal Canal

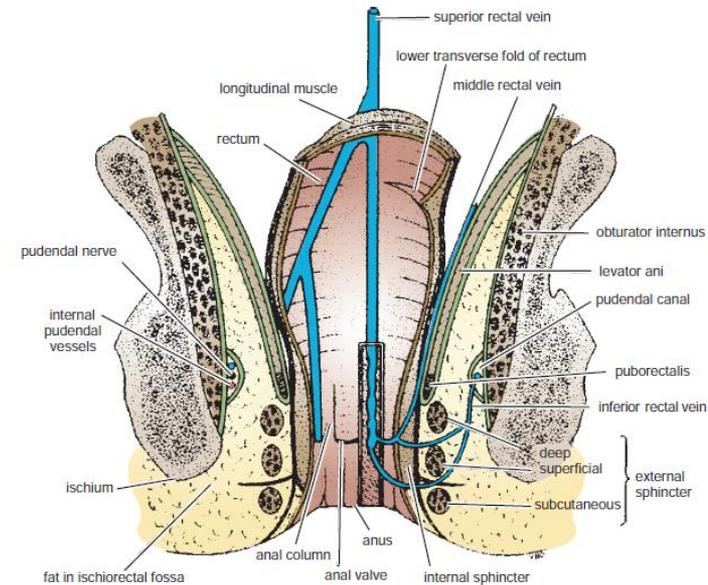
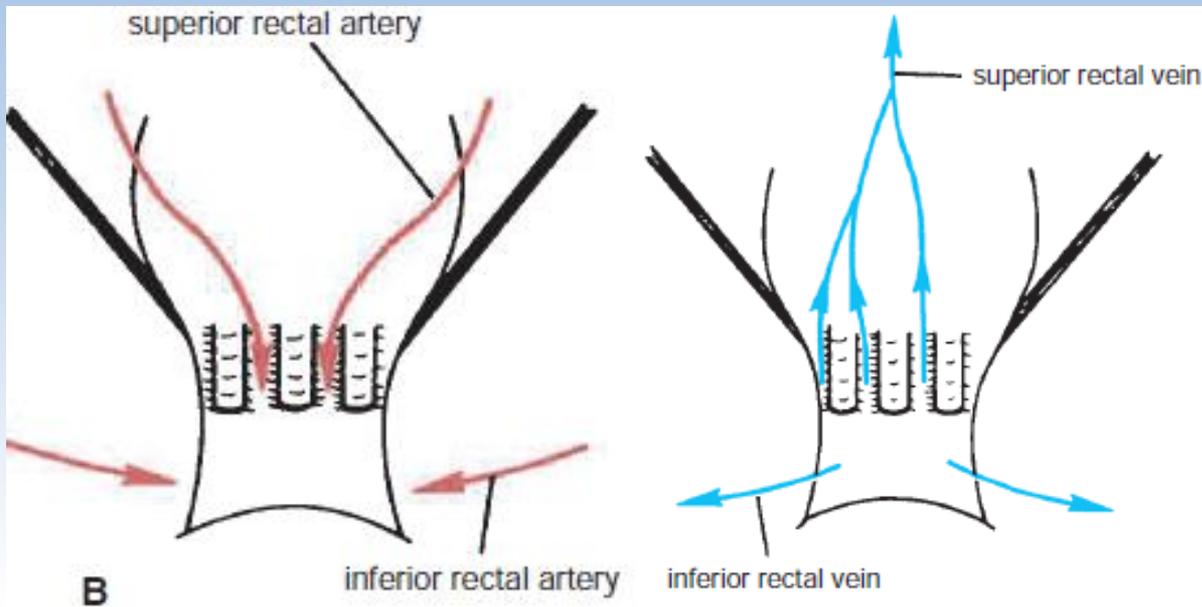
- **Posteriorly:** The **anococcygeal body**, which is a mass of fibrous tissue lying between the anal canal and the coccyx.
- **Laterally:** The fat-filled ischiorectal fossae.
- **Anteriorly:** In the male, the perineal body, the urogenital diaphragm, the membranous part of the urethra, and the bulb of the penis. In the female, the perineal body, the urogenital diaphragm, and the lower part of the vagina.



A

# Structure of the Anal Canal

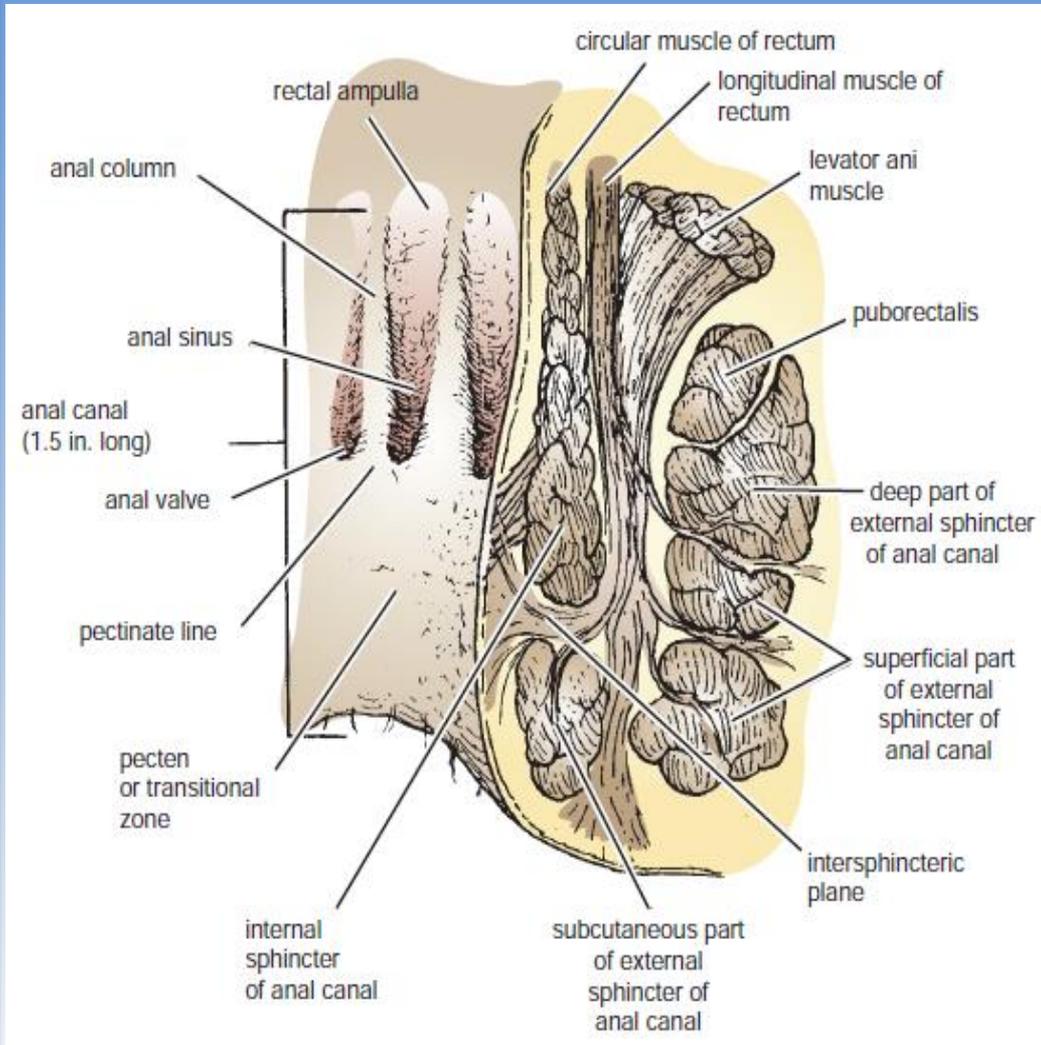
- The **mucous membrane of the upper half of the anal canal** is derived from hindgut **entoderm**. It has the following important anatomic features:
- It is lined by columnar epithelium.
- It is thrown into vertical folds called **anal columns**, which are joined together at their lower ends by small semilunar folds called **anal valves**.
- The **arterial supply** is the superior rectal artery, a branch of the inferior mesenteric artery.
- The **venous drainage** is mainly by the superior rectal vein, a tributary of the inferior mesenteric vein, and the portal vein.



## The mucous membrane of the lower half of the anal canal

- It is derived from **ectoderm** of the proctodeum. It has the following important features:
- It is lined by stratified squamous epithelium, which gradually merges at the anus with the perianal epidermis.
- There are no anal columns.
- The nerve supply is from the somatic inferior rectal nerve; it is thus sensitive to pain, temperature, touch, and pressure.
- The **arterial supply** is the inferior rectal artery, a branch of the internal pudendal artery.
- The **venous drainage** is by the inferior rectal vein, a tributary of the internal pudendal vein, which drains into the internal iliac vein.
- The **lymph drainage** is downward to the medial group of superficial inguinal nodes.
- The **pectinate line** indicates the level where the upper half of the anal canal joins the lower half.

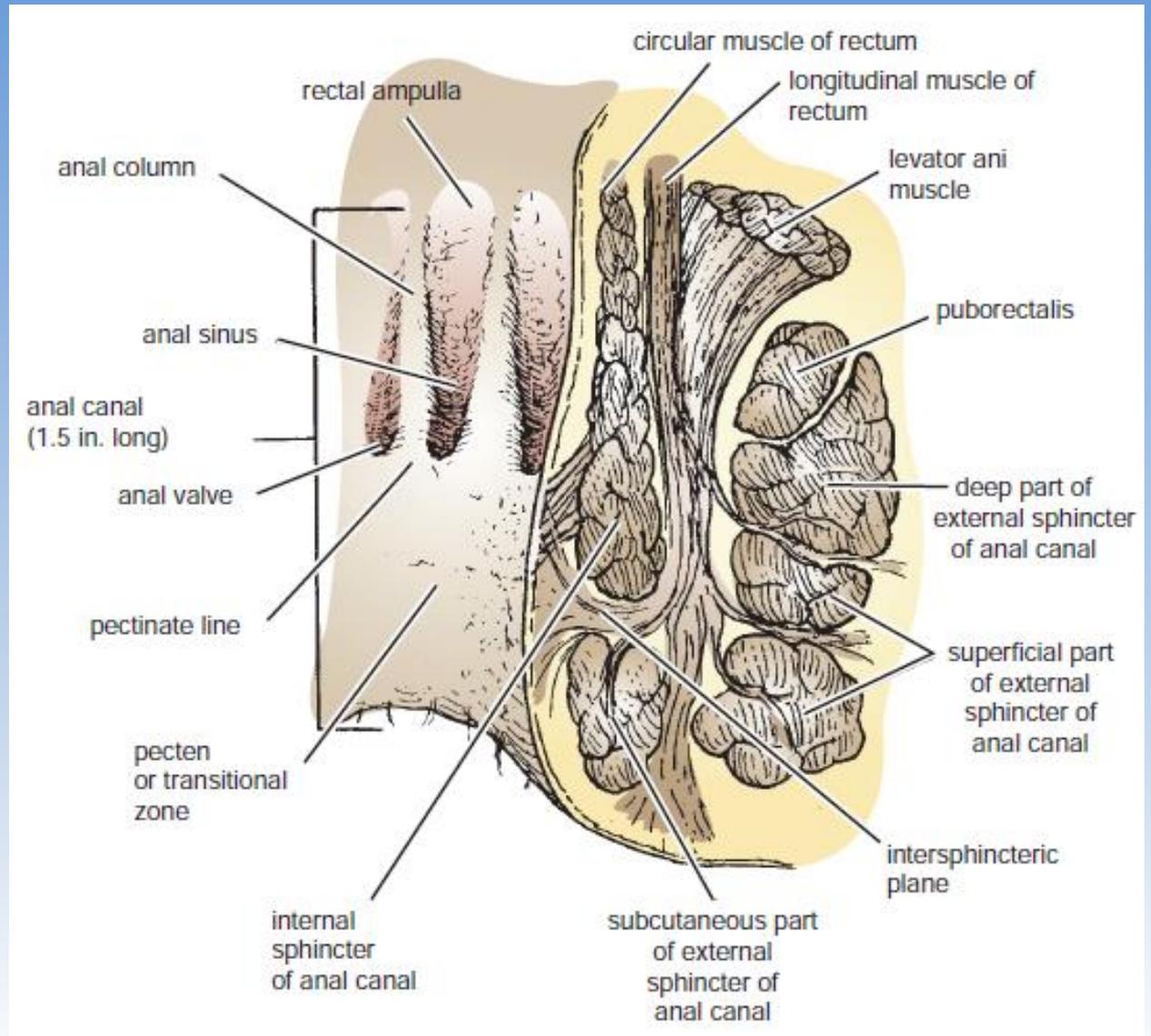
## Anal Canal



## Anal Canal

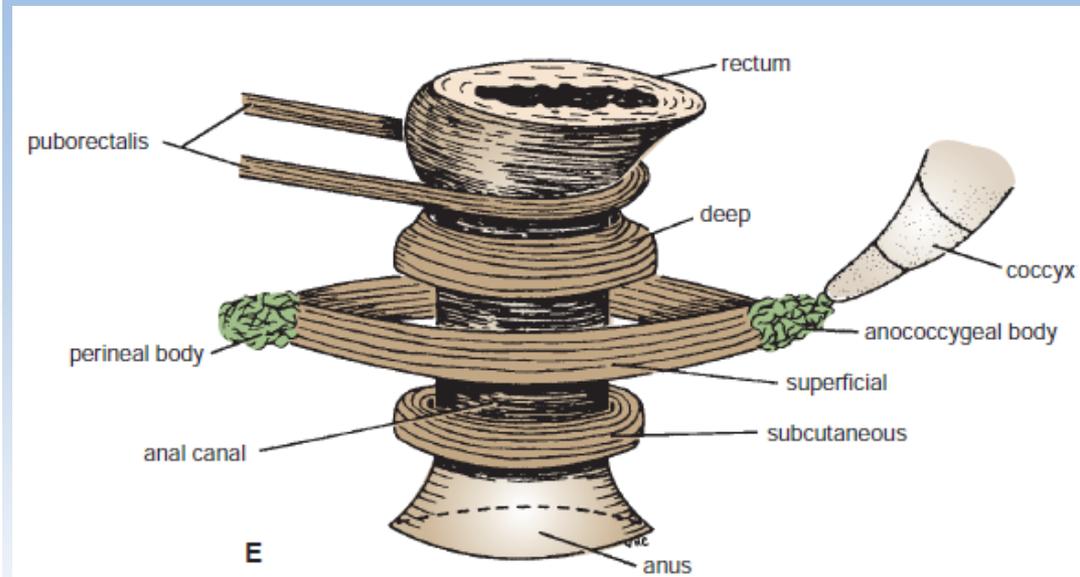
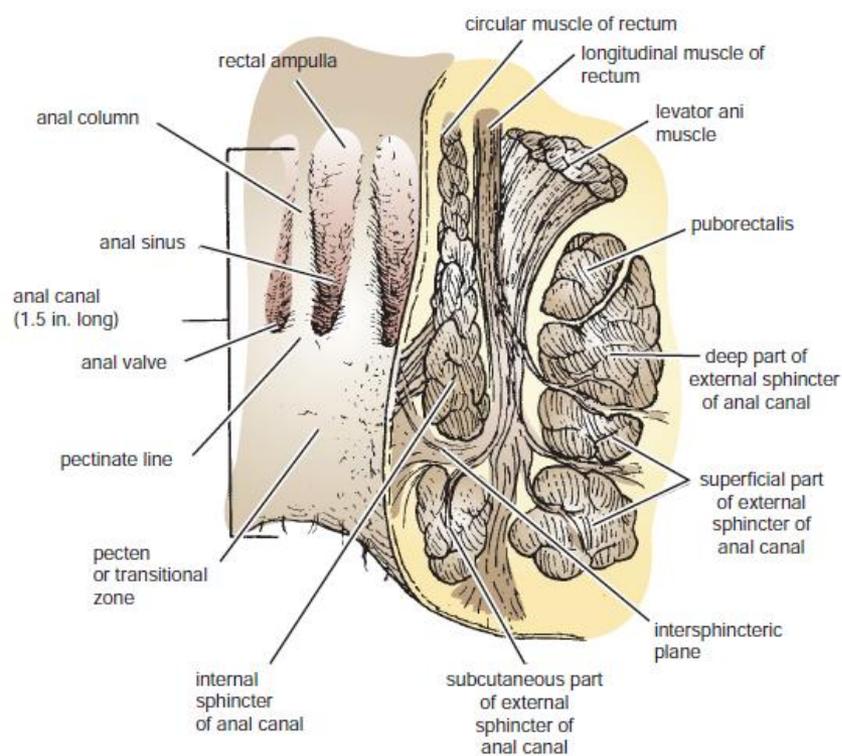
### Muscle Coat

- As in the upper parts of the intestinal tract, it is divided into an outer longitudinal and an inner circular layer of smooth muscle.



# Anal Sphincters

- The anal canal has an involuntary internal sphincter and a voluntary external sphincter.
- The **internal sphincter** is formed from a thickening of the smooth muscle of the circular coat at the upper end of the anal canal.
- The internal sphincter is enclosed by a sheath of striped muscle that forms the voluntary external sphincter.
- The **external sphincter** can be divided into three parts:
  - A **subcutaneous part**, which encircles the lower end of the anal canal and has no bony attachments.
  - A **superficial part**, which is attached to the coccyx behind and the perineal body in front.
  - A **deep part**, which encircles the upper end of the anal canal and has no bony attachments.



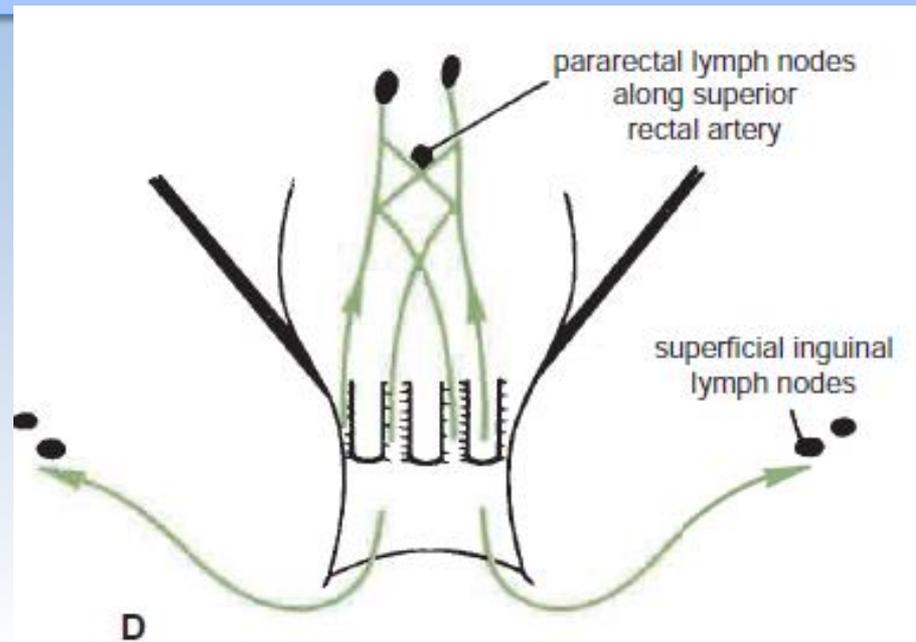
# Anal Canal

## Lymph Drainage

- The upper half of the anal canal drains into the pararectal nodes and then the superior mesenteric nodes. The lower half drains into the superficial inguinal nodes.

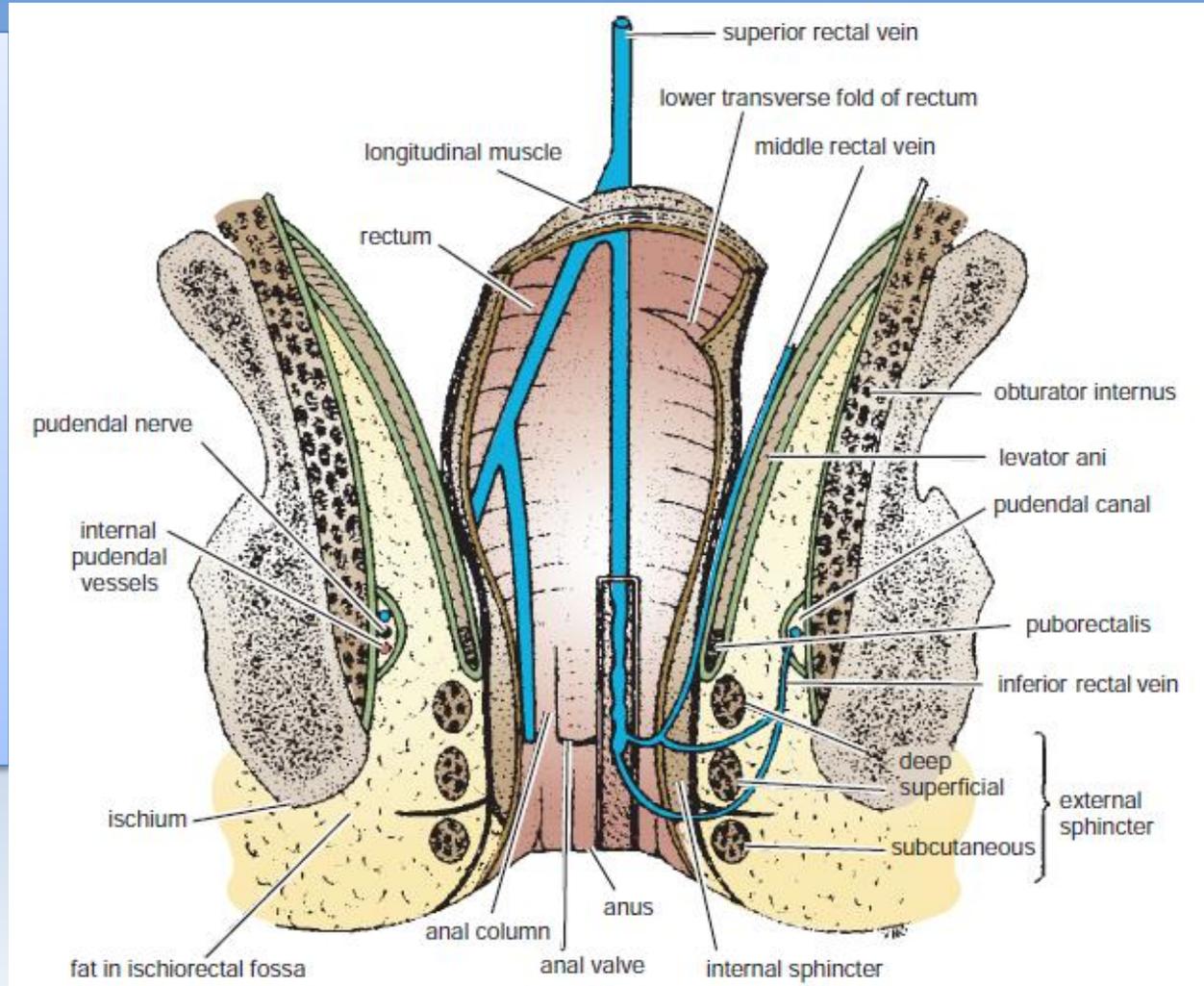
## Nerve Supply

- The mucous membrane of the upper half is sensitive to stretch and is innervated by sensory fibers that ascend through the **hypogastric plexuses**.
- The lower half is sensitive to pain, temperature, touch, and pressure and is innervated by the inferior rectal nerves.
- The involuntary internal sphincter is supplied by sympathetic fibers from the inferior hypogastric plexuses.
- The voluntary external sphincter is supplied by the inferior rectal nerve, a branch of the pudendal nerve and the perineal branch of the fourth sacral nerve.



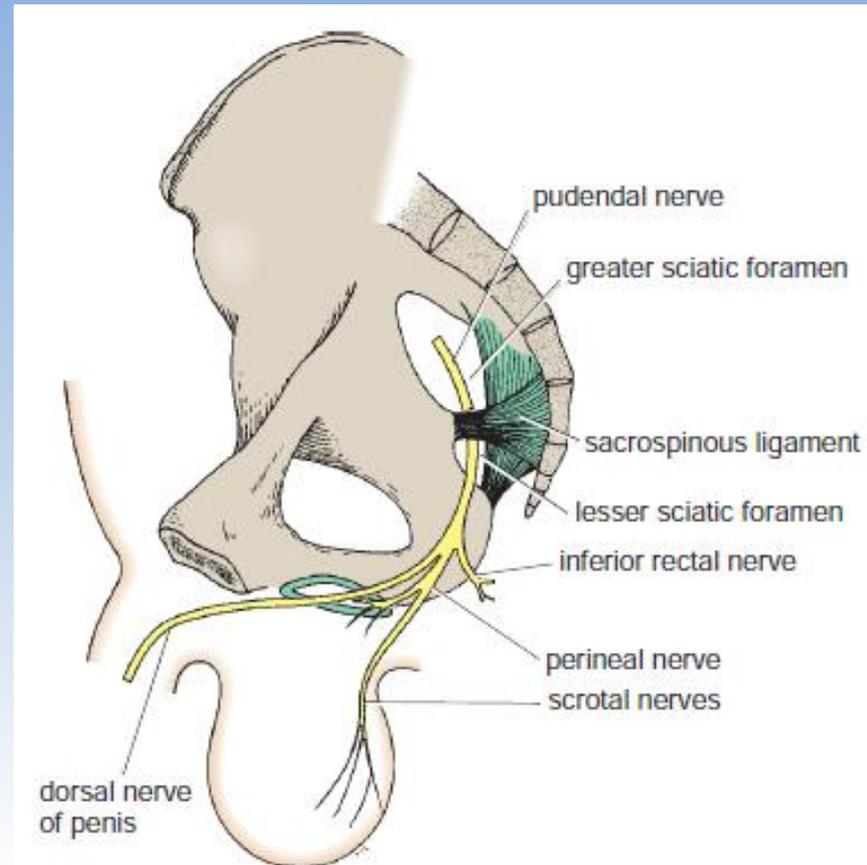
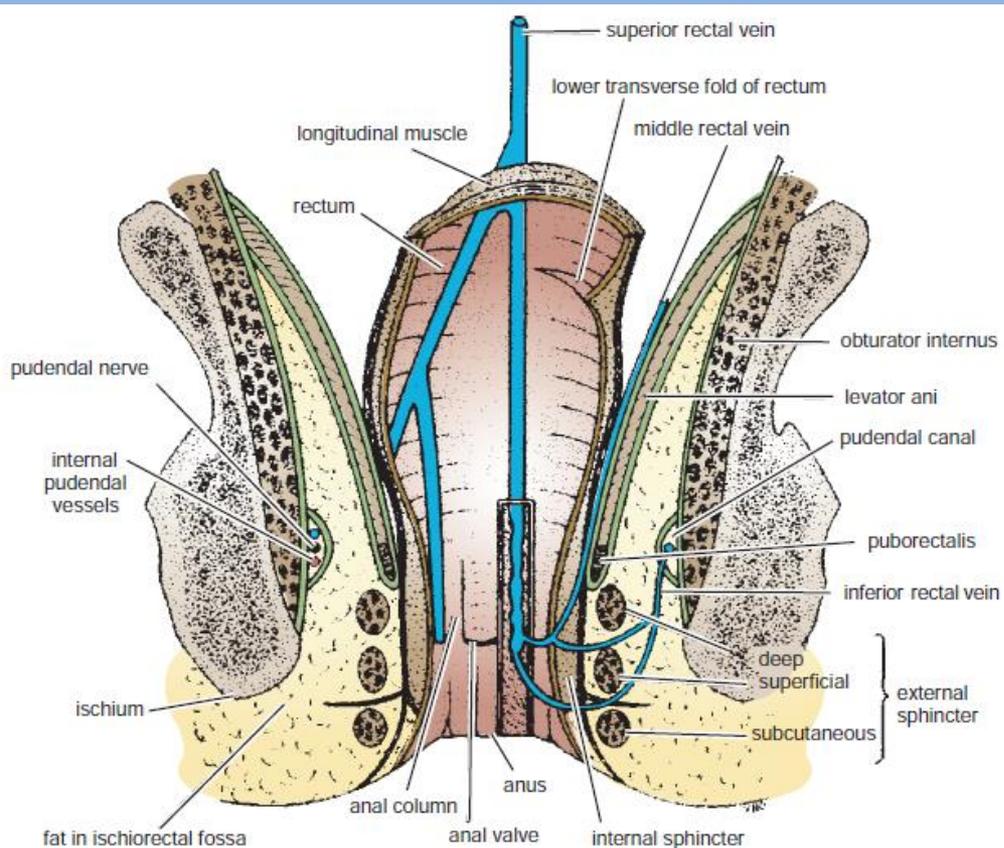
# Ischiorectal Fossa

- The **ischiorectal fossa** (ischioanal fossa) is a wedge-shaped space located on each side of the anal canal.
- The edge of the wedge is formed by the junction of the medial and lateral walls. The medial wall is formed by the sloping levator ani muscle and the anal canal.
- The lateral wall is formed by the lower part of the obturator internus muscle, covered with pelvic fascia.



## Contents of Fossa

- The **ischiorectal fossa** is filled with dense fat, which supports the anal canal and allows it to distend during defecation.
- The pudendal nerve and internal pudendal vessels are embedded in a fascial canal, the pudendal canal, on the lateral wall of the ischiorectal fossa, on the medial side of the ischial tuberosity.
- The inferior rectal vessels and nerve cross the fossa to reach the anal canal.

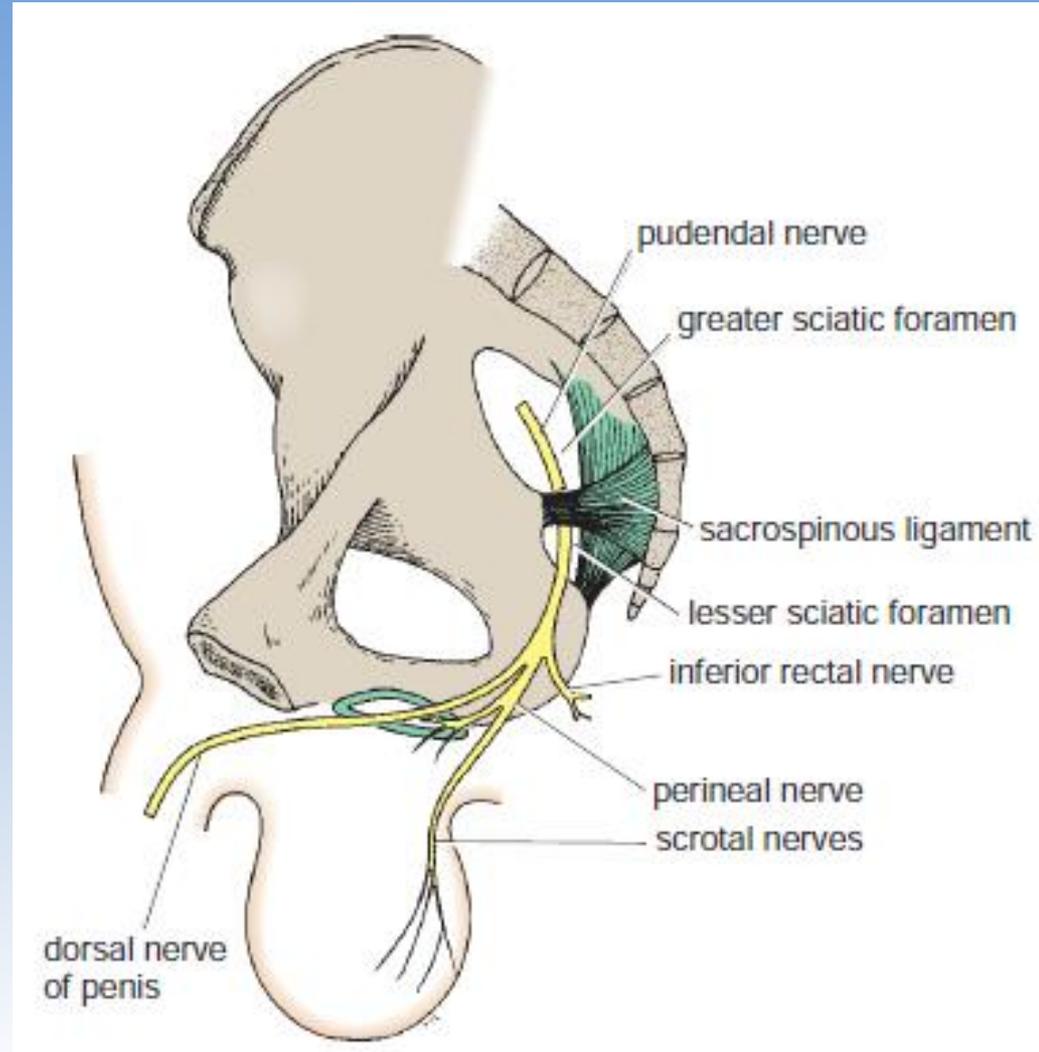


- The **pudendal nerve** is a branch of the **sacral plexus** and leaves the main pelvic cavity through the greater sciatic foramen.
- After a brief course in the gluteal region of the lower limb, it enters the perineum through the lesser sciatic foramen.
- The nerve then passes forward in the pudendal canal and, by means of its branches, supplies the external anal sphincter and the muscles and skin of the perineum.

### Branches

- **Inferior rectal nerve:** This runs medially across the ischiorectal fossa and supplies the external anal sphincter, the mucous membrane of the lower half of the anal canal, and the perianal skin.
- **Dorsal nerve of the penis (or clitoris):** This is distributed to the penis (or clitoris).
- **Perineal nerve:** This supplies the muscles in the urogenital triangle and the skin on the posterior surface of the scrotum (or labia majora).

## Pudendal Nerve



# Internal Pudendal Artery

## The internal pudendal artery

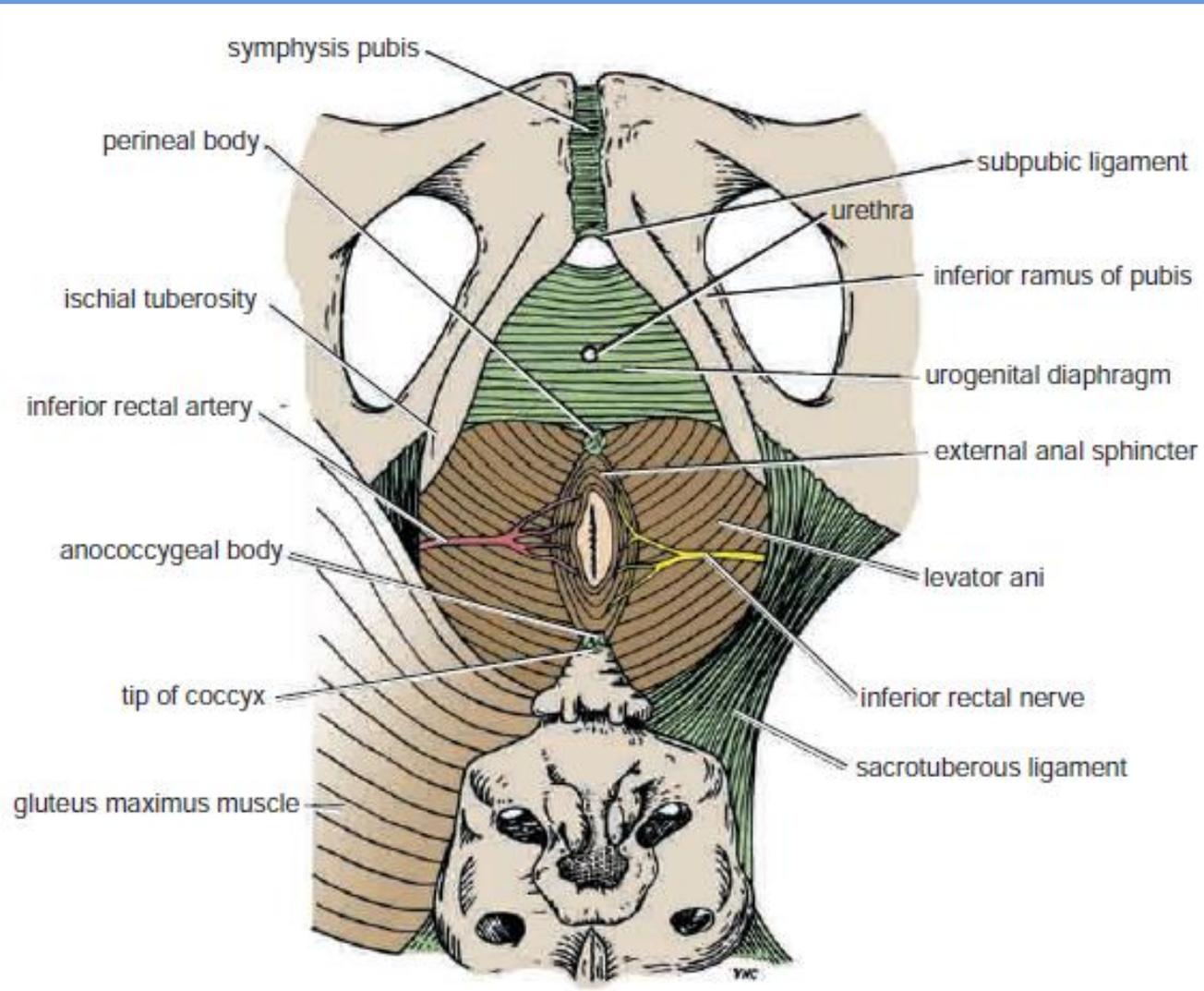
- is a branch of the internal iliac artery and passes from the pelvis through the greater sciatic foramen and enters the perineum through the lesser sciatic foramen.

## Branches

- Inferior rectal artery:** This supplies the lower half of the anal canal.
- Branches to the penis** in the male and **to the labia and clitoris** in the female.

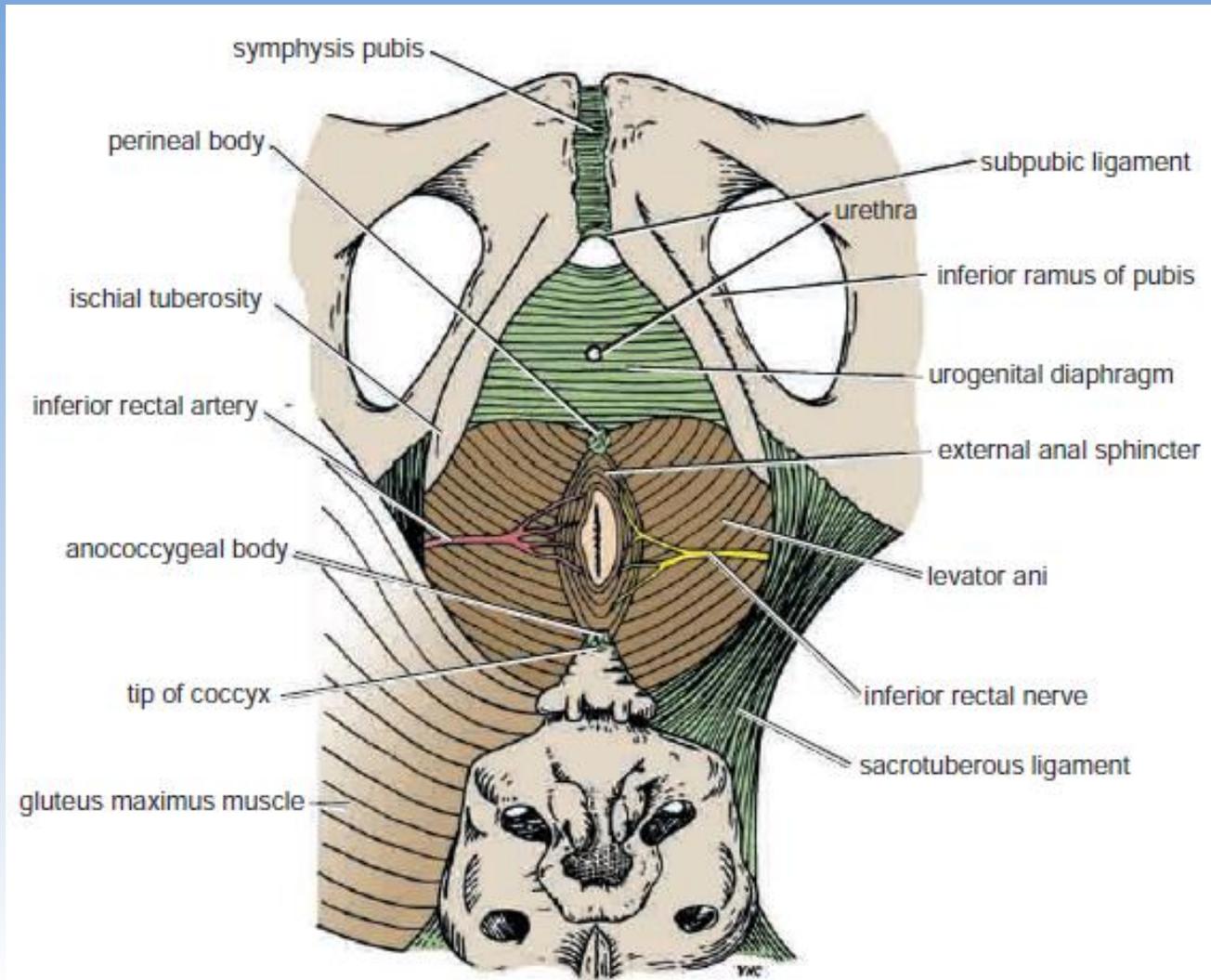
## Internal Pudendal Vein

- The internal pudendal vein receives tributaries that correspond to the branches of the internal pudendal artery.



# Urogenital Triangle

- The urogenital triangle is bounded in front by the pubic arch and laterally by the ischial tuberosities.



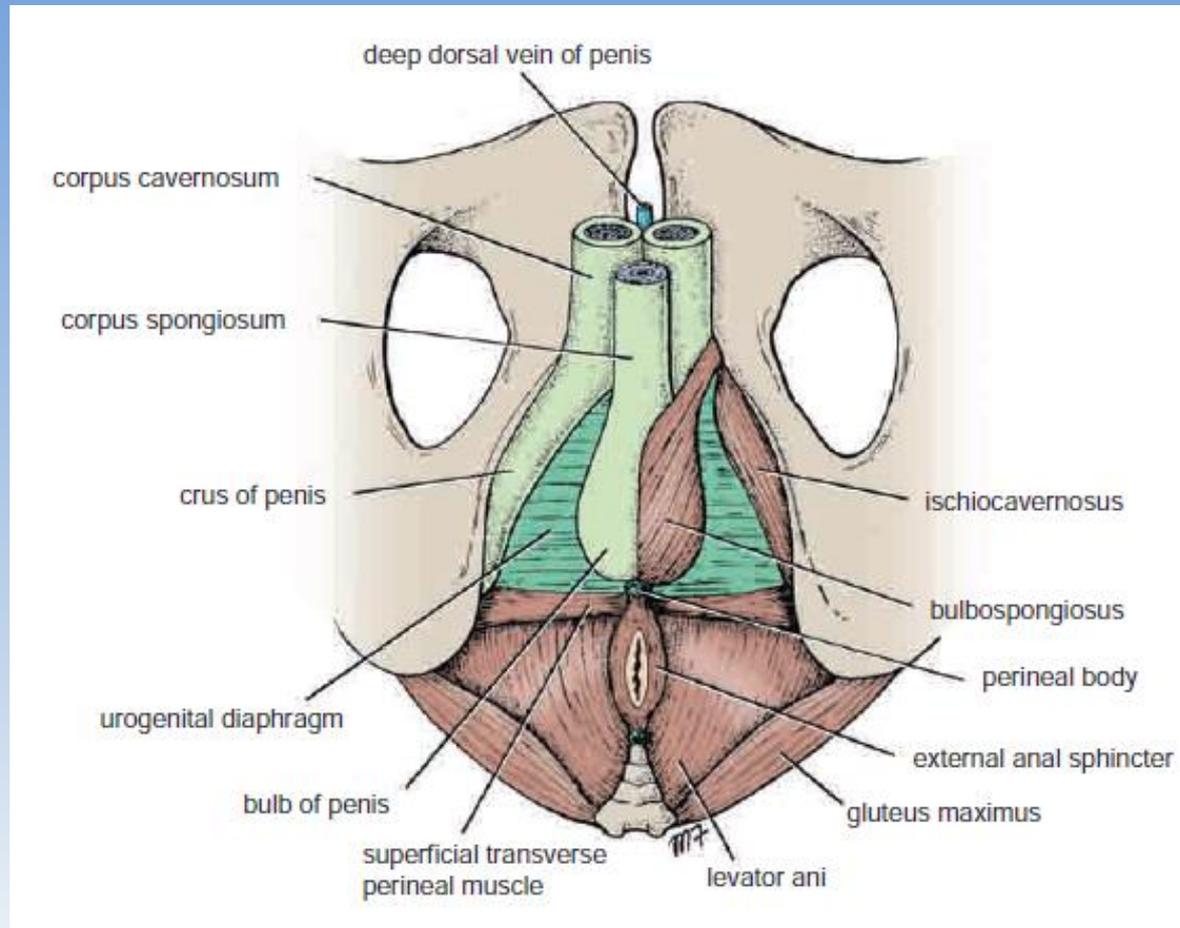
## Penis

- The penis has a fixed root and a body that hangs free.

### Root of the Penis

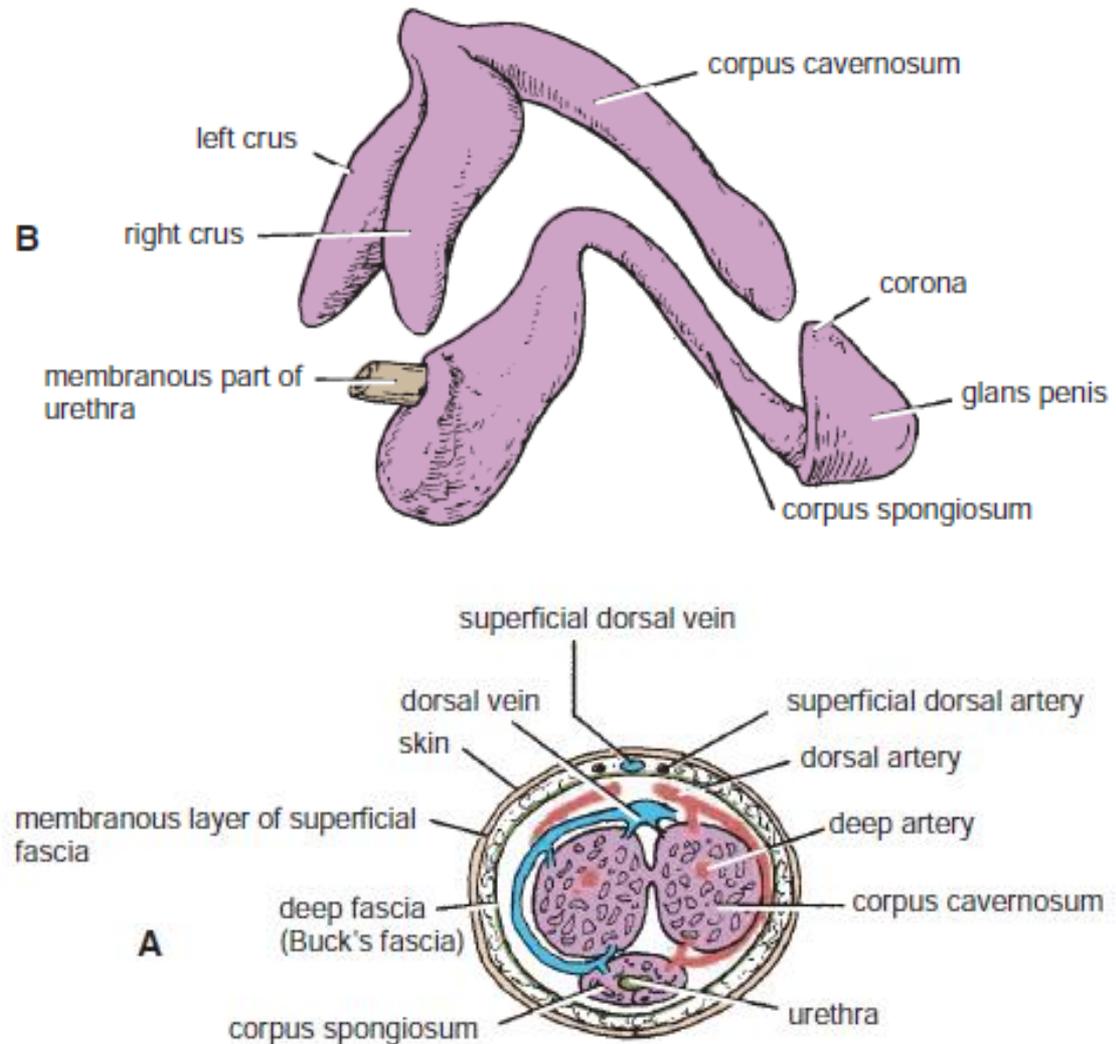
- The root of the penis is made up of three masses of erectile tissue called the **bulb of the penis** and the **right** and **left crura of the penis**.
- The bulb is situated in the midline and is attached to the undersurface of the urogenital diaphragm. It is traversed by the urethra and is covered on its outer surface by the **bulbospongiosus muscles**.
- Each crus is attached to the side of the pubic arch and is covered on its outer surface by the **ischiocavernosus muscle**.
- The bulb is continued forward into the body of the penis and forms the **corpus spongiosum**.
- The two crura converge anteriorly and come to lie side by side in the dorsal part of the body of the penis, forming the **corpora cavernosa**.

## Contents of the Male Urogenital Triangle



## Body of the Penis

- The **body of the penis** is essentially composed of three cylinders of erectile tissue enclosed in a tubular sheath of fascia (**Buck's fascia**).
- The erectile tissue is made up of two dorsally placed corpora cavernosa and a single corpus spongiosum applied to their ventral surface.
- At its distal extremity, the corpus spongiosum expands to form the **glans penis**, which covers the distal ends of the corpora cavernosa.
- On the tip of the glans penis is the slitlike orifice of the urethra, called the **external urethral meatus**.
- The **prepuce** or **foreskin** is a hoodlike fold of skin that covers the glans.
- It is connected to the glans just below the urethral orifice by a fold called the **frenulum**.
- The body of the penis is supported by two condensations of deep fascia that extend downward from the linea alba and symphysis pubis to be attached to the fascia of the penis.



# Blood Supply of the Penis

## Arteries

- The corpora cavernosa are supplied by the **deep arteries of the penis**; the corpus spongiosum is supplied by the **artery of the bulb**. In addition, there is the **dorsal artery of the penis**.
- All the above arteries are branches of the internal pudendal artery.

## Veins

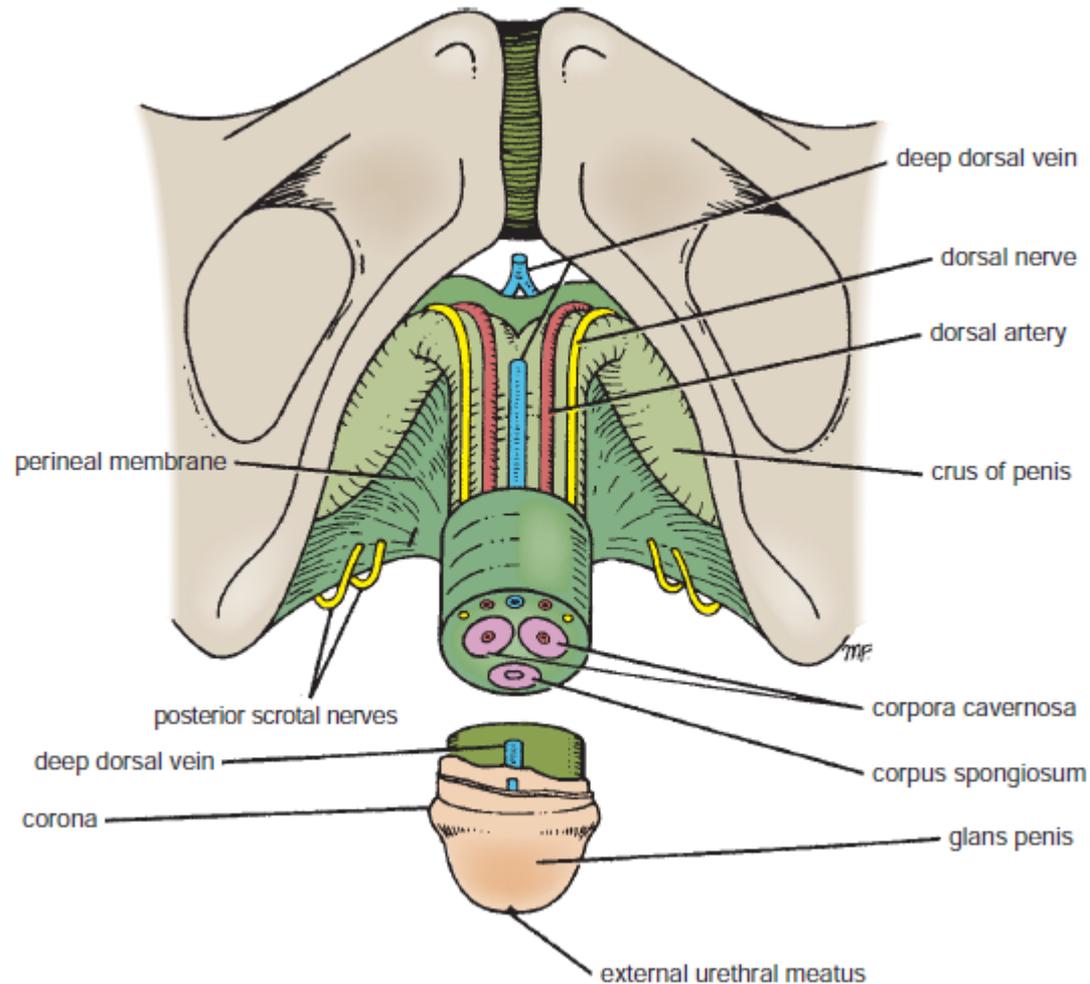
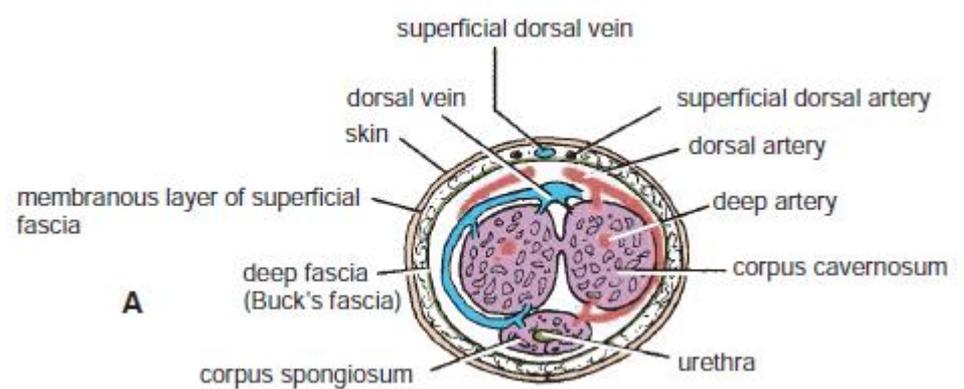
- The veins drain into the internal pudendal veins.

## Lymph Drainage

- The skin of the penis is drained into the medial group of superficial inguinal nodes. The deep structures of the penis are drained into the internal iliac nodes.

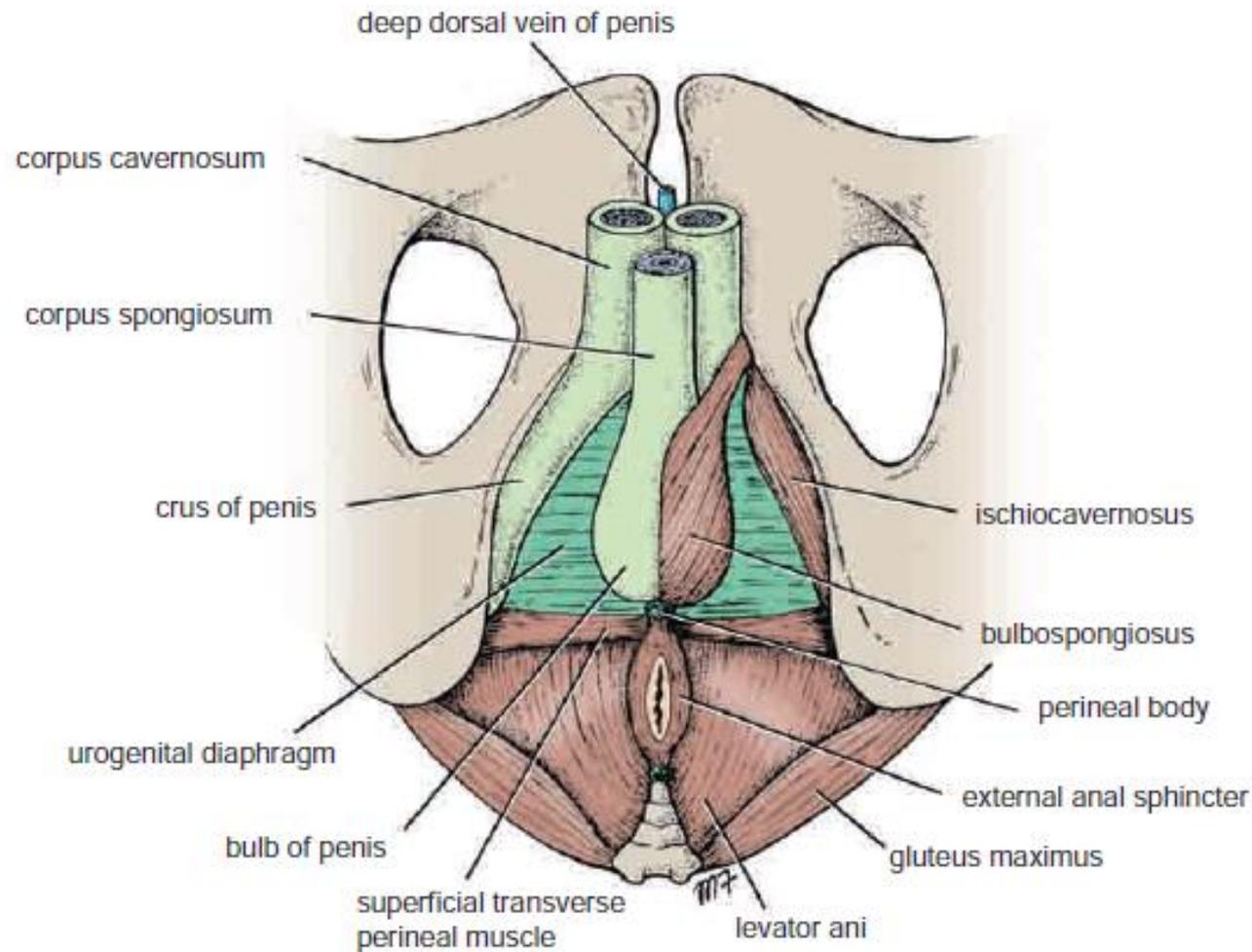
## Nerve Supply

- The nerve supply is from the pudendal nerve and the pelvic plexuses.



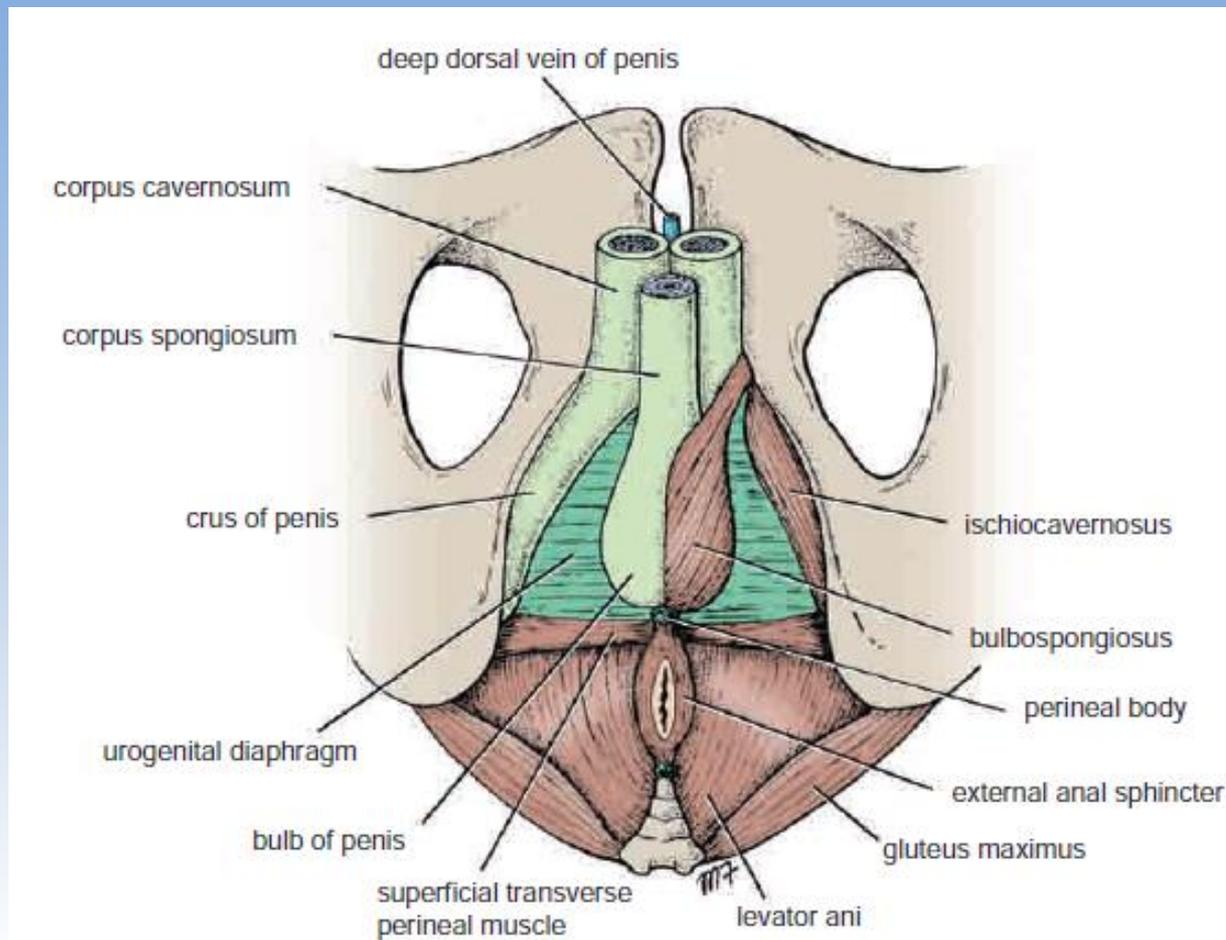
# Bulbospongiosus Muscles

- The **bulbospongiosus muscles**, situated one on each side of the midline, cover the bulb of the penis and the posterior portion of the corpus spongiosum.
- Their function is to compress the penile part of the urethra and empty it of residual urine or semen.
- The anterior fibers also compress the deep dorsal vein of the penis, thus impeding the venous drainage of the erectile tissue and thereby assisting in the process of erection of the penis.



## Ischiocavernosus Muscles

- The ischiocavernosus muscles cover the crus penis on each side.
- The action of each muscle is to compress the crus penis and assist in the process of erection of the penis.

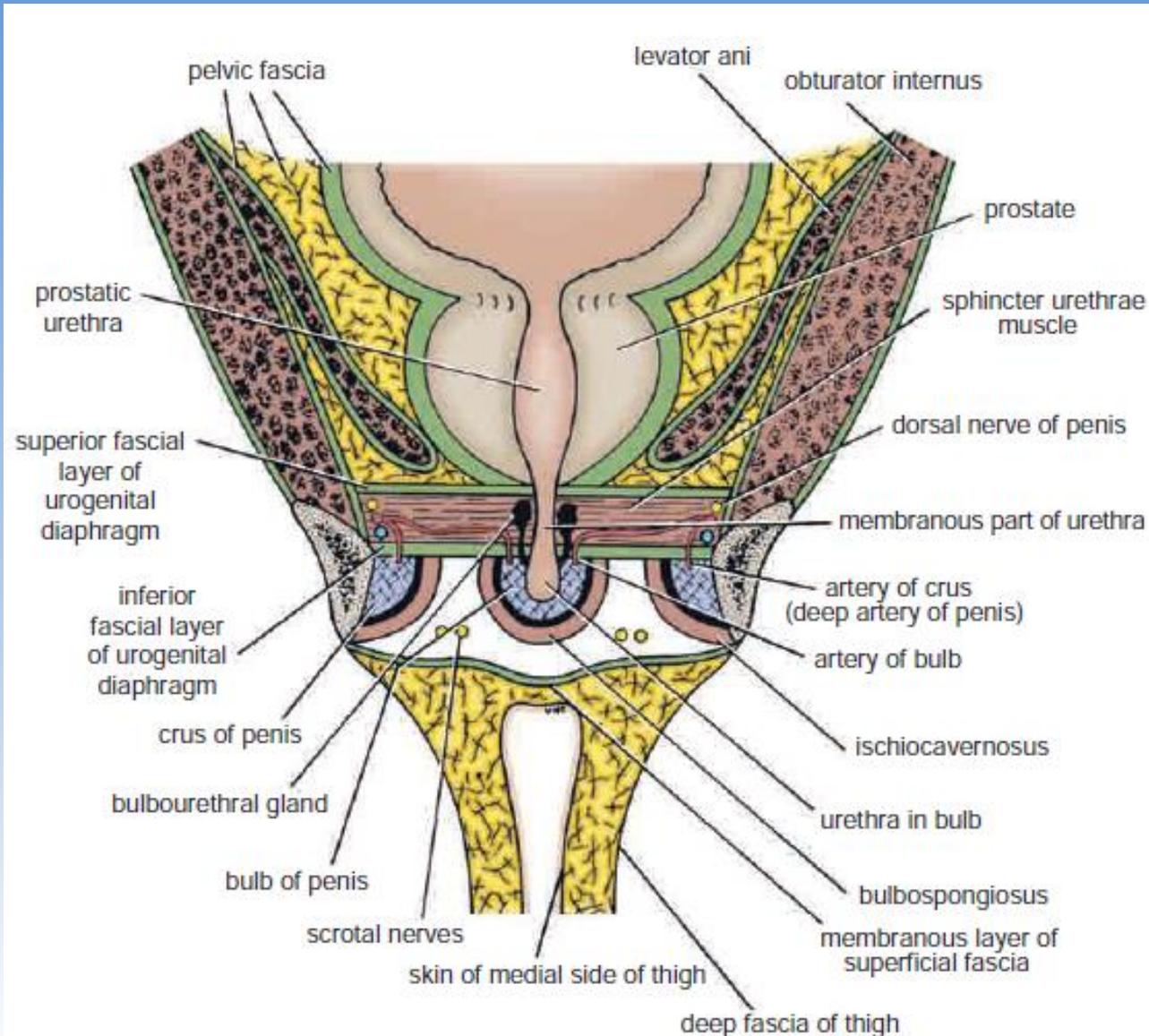


# Membranous Part of the Urethra

- The **membranous part of the urethra** is about 1.3 cm long and lies within the urogenital diaphragm, surrounded by the sphincter urethrae muscle; it is continuous above with the prostatic urethra and below with the penile urethra.
- It is the shortest and least dilatable part of the urethra.

## Sphincter Urethrae Muscle

- The sphincter urethrae muscle surrounds the urethra in the deep perineal pouch.
- It arises from the pubic arch on the two sides and passes medially to encircle the urethra.



# Male Urethra

- The **male urethra** is about 20 cm long and extends from the neck of the bladder to the external meatus on the glans penis. It is divided into three parts: prostatic, membranous, and penile.

## The prostatic urethra

- It is about 3 cm long and passes through the prostate from the base to the apex.
- It is the widest and most dilatable portion of the urethra.

## The membranous urethra

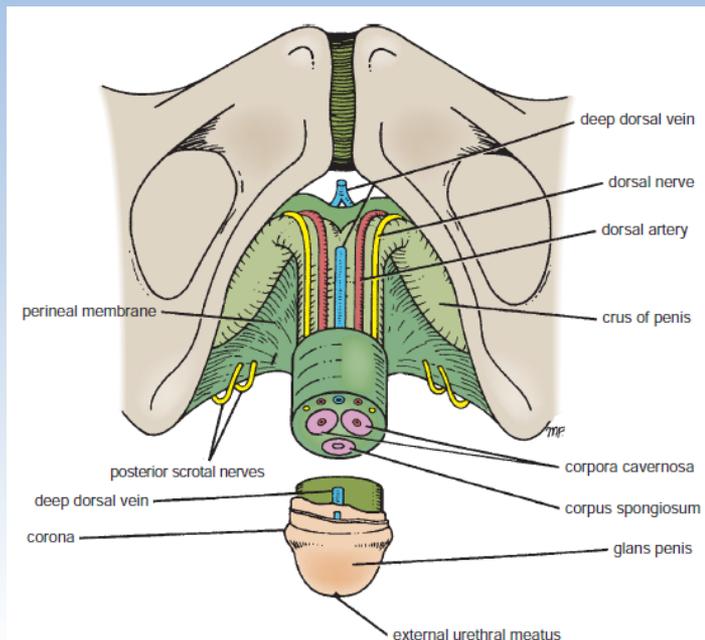
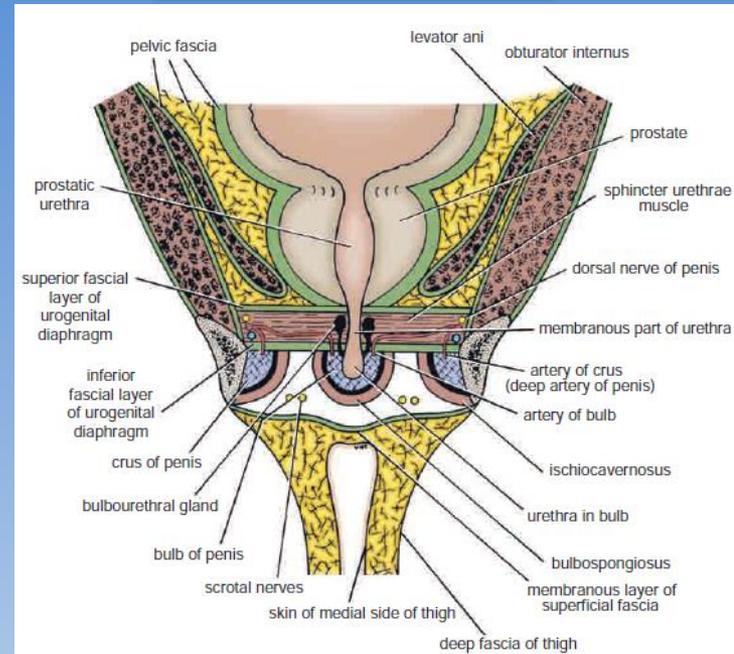
- is about 1.25 cm long and lies within the urogenital diaphragm, surrounded by the sphincter urethrae muscle.
- It is the least dilatable portion of the urethra.

## The penile urethra

- It is about 15.75 cm long and is enclosed in the bulb and the corpus spongiosum of the penis.

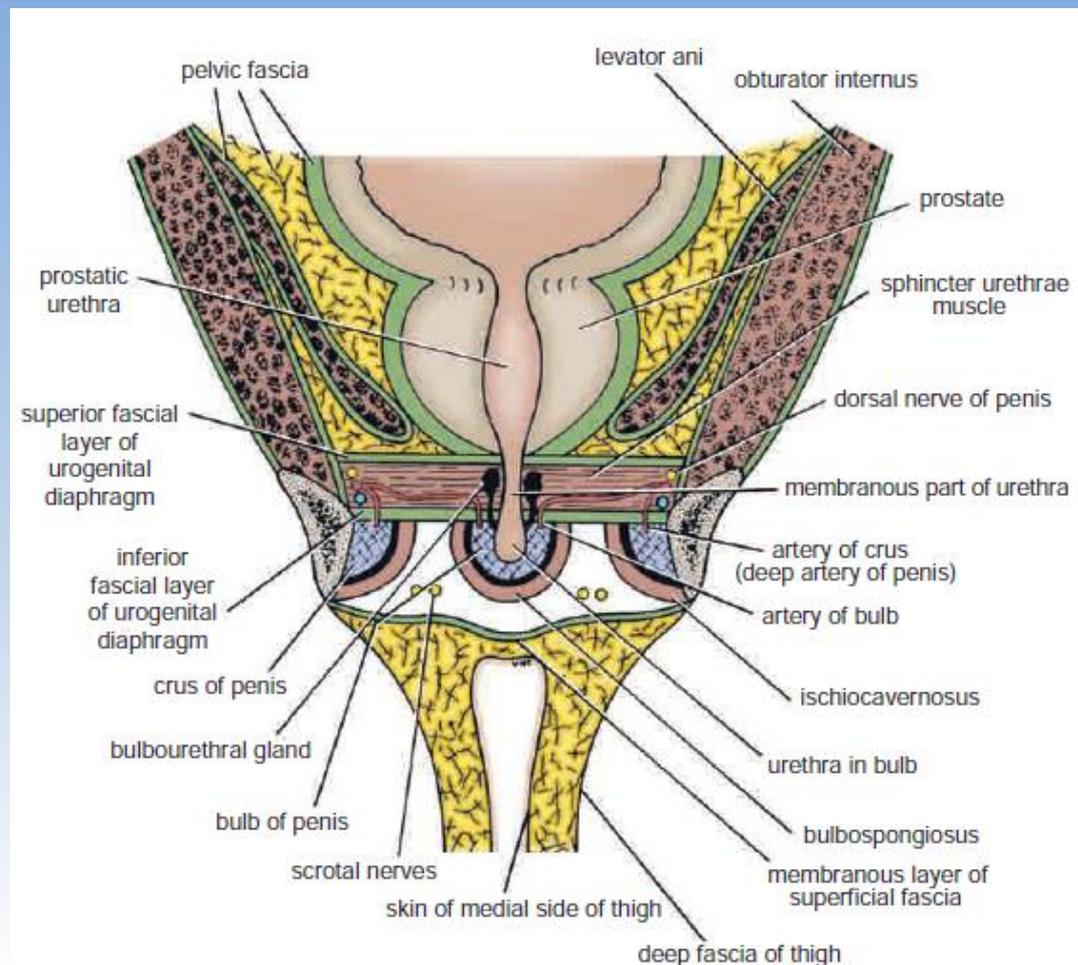
## The external meatus

- It is the narrowest part of the entire urethra. The part of the urethra that lies within the glans penis is dilated to form the **fossa terminalis (navicular fossa)**.
- The bulbourethral glands open into the penile urethra below the urogenital diaphragm.



## Bulbourethral Glands

- The bulbourethral glands are two small glands that lie beneath the sphincter urethrae muscle.
- Their ducts pierce the perineal membrane (inferior fascial layer of the urogenital diaphragm) and enter the penile portion of the urethra.
- The secretion is poured into the urethra as a result of erotic stimulation.



## Contents of the Female Urogenital Triangle

- In the female, the triangle contains the **external genitalia** and the **orifices** of the **urethra** and the **vagina**.

# Vulva

- The term **vulva** is the collective name for the female external genitalia and includes the mons pubis, labia majora and minora, the clitoris, the vestibule of the vagina, the vestibular bulb, and the greater vestibular glands.

## Blood Supply

- Branches of the external and internal pudendal arteries on each side.

## Lymph Drainage

- Medial group of superficial inguinal nodes.

## Nerve Supply

- The anterior parts of the vulva are supplied by the ilioinguinal nerves and the genital branch of the genitofemoral nerves.
- The posterior parts of the vulva are supplied by the branches of the perineal nerves and the posterior cutaneous nerves of the thigh.

# Clitoris

- The clitoris, which corresponds to the penis in the male, is situated at the apex of the vestibule anteriorly. It has a structure similar to the penis. The glans of the clitoris is partly hidden by the prepuce.

## Root of the Clitoris

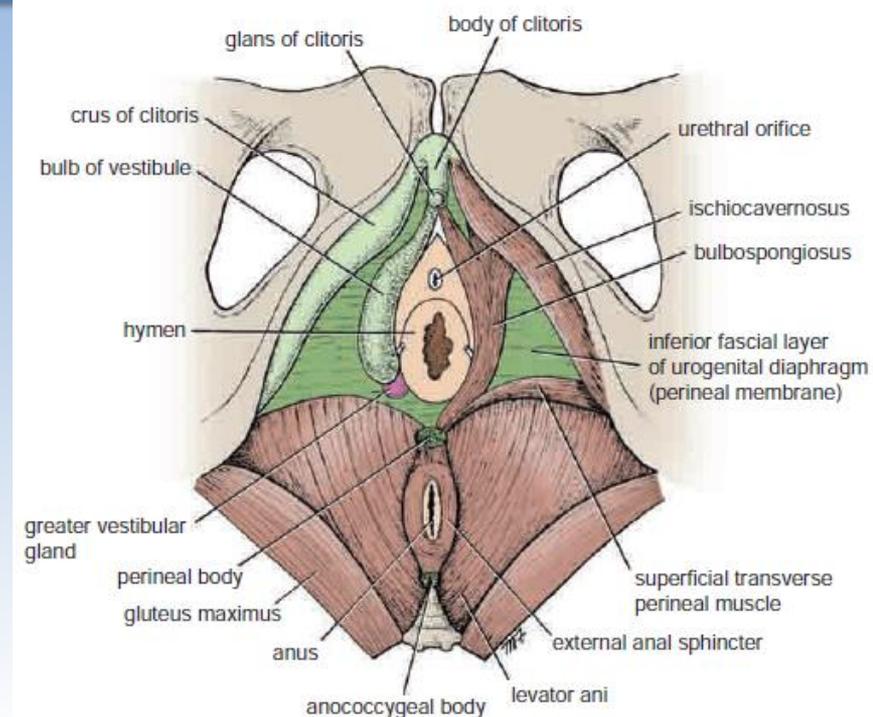
- The root of the clitoris is made up of three masses of erectile tissue called the **bulb of the vestibule** and the **right** and **left crura of the clitoris**.
- The **bulb of the vestibule** corresponds to the bulb of the penis, but because of the presence of the vagina, it is divided into two halves. it is attached to the undersurface of the urogenital diaphragm and is covered by the **bulbospongiosus muscles**.
- The **crura of the clitoris** correspond to the crura of the penis and become the corpora cavernosa anteriorly. Each remains separate and is covered by an **ischiocavernosus muscle**.

## Body of the Clitoris

- The body of the clitoris consists of the two **corpora cavernosa** covered by their **ischiocavernosus muscles**.
- The corpus spongiosum of the male is represented by a small amount of erectile tissue leading from the vestibular bulbs to the glans.

## Glans of the Clitoris

- The glans of the clitoris is a small mass of erectile tissue that caps the body of the clitoris. It is provided with numerous sensory endings. The glans is partly hidden by the **prepuce**.



# Vulva

## Mons Pubis

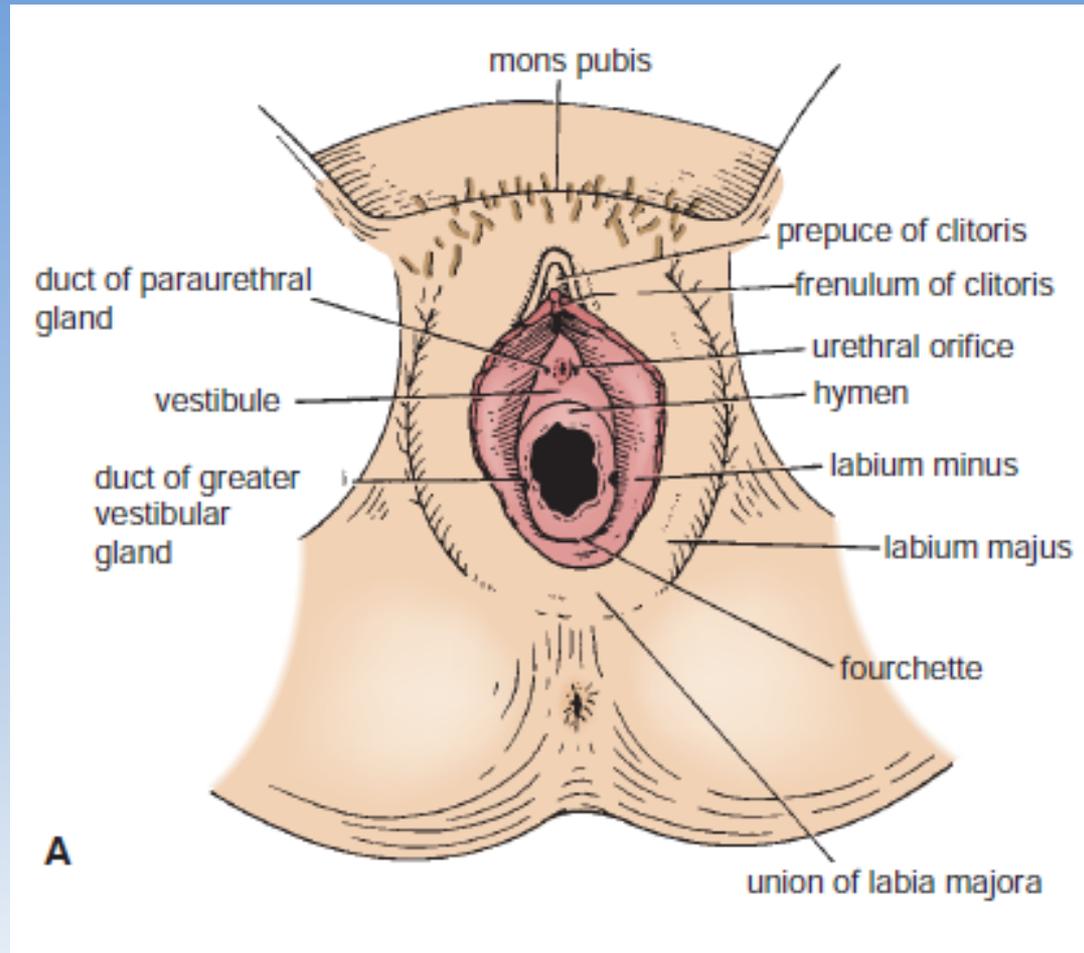
- The mons pubis is the rounded, hair-bearing elevation of skin found anterior to the pubis.
- The pubic hair in the female has an abrupt horizontal superior margin, whereas in the male it extends upward to the umbilicus.

## Labia Majora

- The labia majora are prominent, hair-bearing folds of skin extending posteriorly from the mons pubis to unite posteriorly in the midline.

## Labia Minora

- The labia minora are two smaller, hairless folds of soft skin that lie between the labia majora.
- Their posterior ends are united to form a sharp fold, the **fourchette**. Anteriorly, they split to enclose the clitoris.



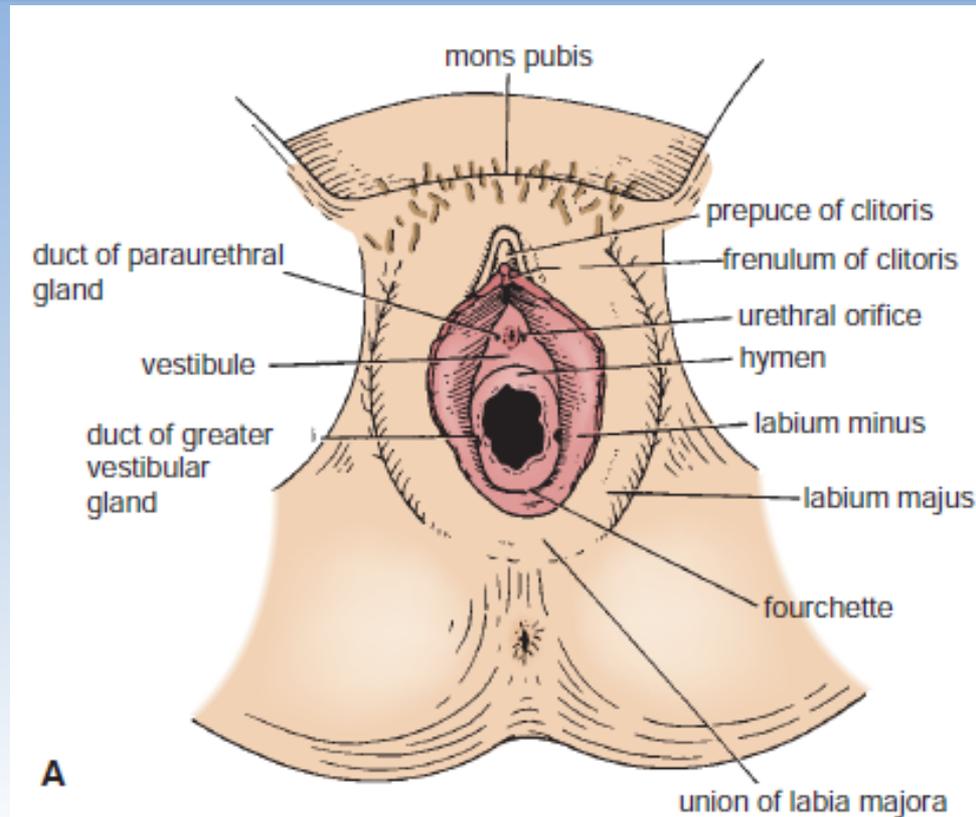
# Vulva

## Vestibule

- The vestibule is a smooth triangular area bounded laterally by the labia minora, with the clitoris at its apex and the fourchette at its base.

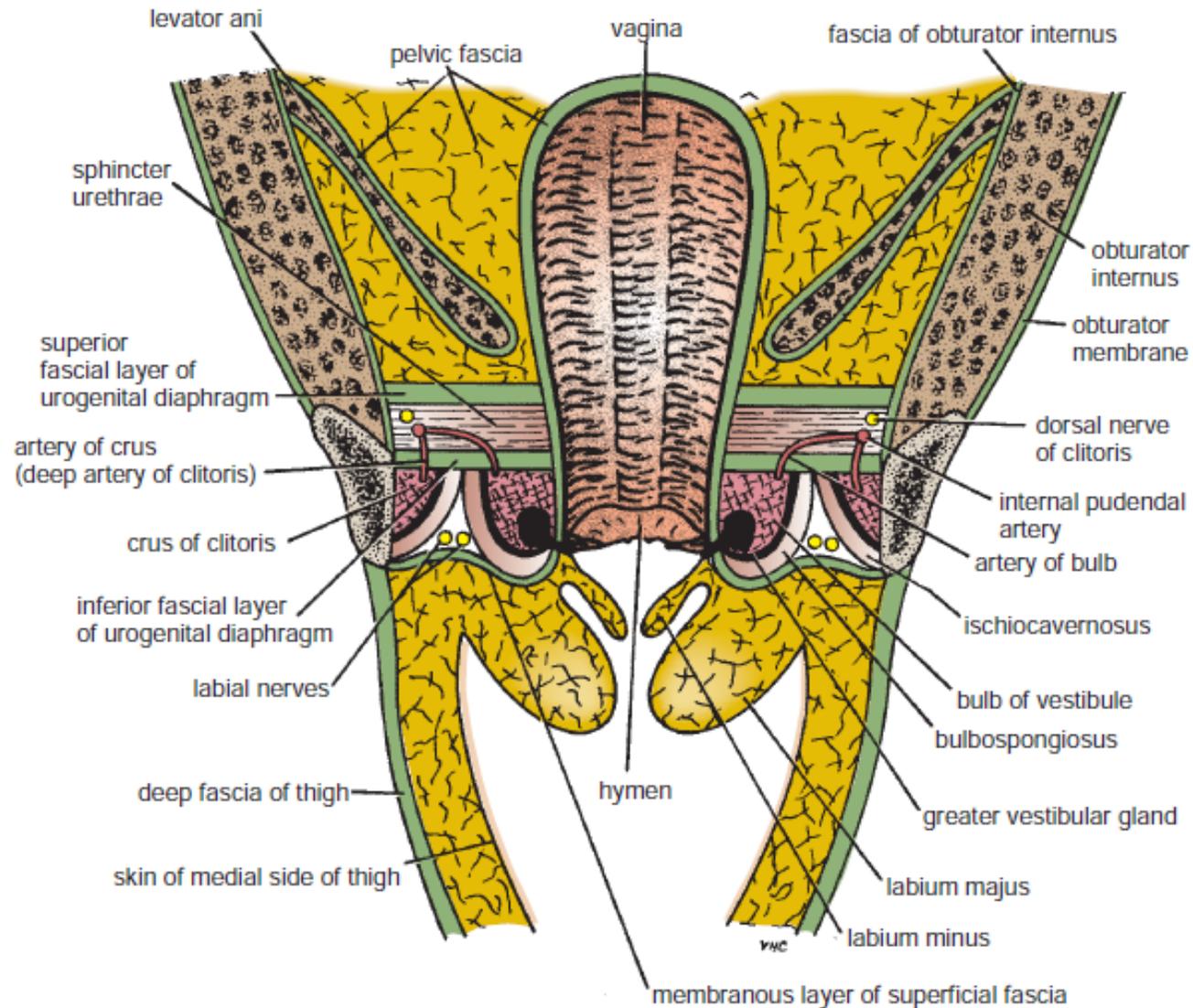
## Vaginal Orifice

- The vaginal orifice is protected in virgins by a thin mucosal fold called the **hymen**, which is perforated at its center.



# Greater Vestibular Glands

- The greater vestibular glands are a pair of small mucus-secreting glands that lie under cover of the posterior parts of the bulb of the vestibule and the labia majora.
- Each drains its secretion into the vestibule by a small duct, which opens into the groove between the hymen and the posterior part of the labium minus.
- These glands secrete a lubricating mucus during sexual intercourse.



# Female Urethra

- The female urethra is about 3.8 cm long. It extends from the neck of the bladder to the **external meatus**, where it opens into the vestibule about 2.5 cm below the clitoris.
- It traverses the sphincter urethrae and lies immediately in front of the vagina.
- At the sides of the external urethral meatus are the small openings of the ducts of the paraurethral glands.

## Paraurethral Glands

- The paraurethral glands, which correspond to the prostate in the male, open into the vestibule by small ducts on either side of the urethral orifice.

