

# Urethra & Sacral Plexus – Summary

## Female Urethra

- Short tube: about 4 cm long and 6 mm diameter.
- Wider and more dilatable than male urethra.
- Begins at the internal urethral orifice at the bladder neck.
- Passes downward and forward through the deep perineal pouch.
- Opens into the vestibule of the vagina by the external urethral orifice.
- Surrounded by the internal urethral sphincter.

## Male Urethra

### General Features

- Starts from the internal urethral orifice in the bladder.
- Ends at the external urethral orifice at the tip of the glans penis.
- Length  $\approx$  20 cm.
- Divided into 3 parts:
  1. Prostatic urethra
  2. Membranous urethra
  3. Spongy (penile) urethra

### 1. Prostatic Urethra

- About 3 cm long.
- Passes through the prostate gland.
- Widest and most dilatable part.

#### *Important Features*

- Urethral crest: longitudinal ridge on posterior wall.
- Prostatic sinuses: receive openings of prostatic glands.
- Seminal colliculus contains:
  - Opening of prostatic utricle.
  - Two openings of ejaculatory ducts.

### 2. Membranous Urethra

- About 2 cm long.
- Narrowest part of the male urethra.
- Traverses the deep perineal pouch.

- Surrounded by the external urethral sphincter.

### 3. Spongy (Penile) Urethra

- About 15 cm long.
- Runs inside the corpus spongiosum.

#### **Dilatations**

- Intrabulbar fossa at beginning.
- Fossa terminalis (navicularis) near glans penis.

## Urethral Sphincters

### Internal Urethral Sphincter

- Smooth muscle.
- Involuntary.
- Located around bladder neck and upper prostatic urethra.
- Supplied by autonomic nerves.
- Prevents retrograde ejaculation.

### External Urethral Sphincter

- Skeletal (striated) muscle.
- Voluntary.
- Surrounds membranous urethra.
- Supplied by perineal branch of pudendal nerve.

## Lymphatic Drainage of Male Urethra

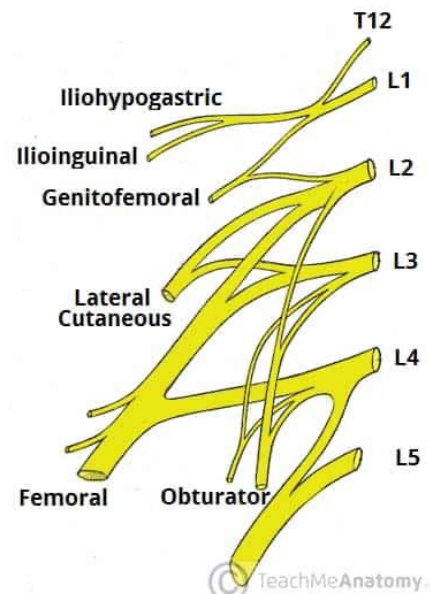
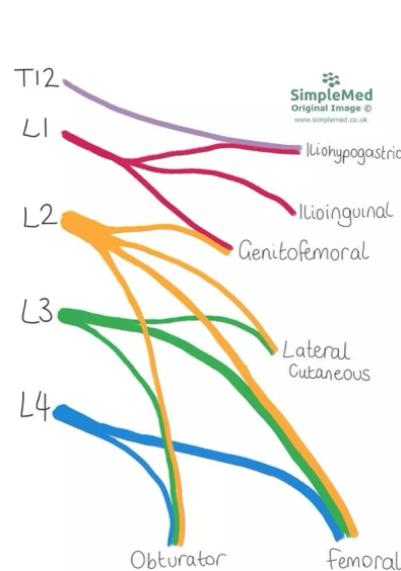
- Prostatic + membranous parts → internal iliac lymph nodes.
- Spongy urethra → deep inguinal lymph nodes.

## Lumbar Plexus

- Formed by anterior rami of L1–L4.
- Supplies lower limb and pelvic girdle.

### Main Branches

1. Iliohypogastric nerve (T12, L1)
2. Ilioinguinal nerve (L1)
3. Genitofemoral nerve (L1, L2)
4. Lateral femoral cutaneous nerve (L2, L3)
5. Obturator nerve (L2, L3, L4)



6. Femoral nerve (L2, L3, L4)

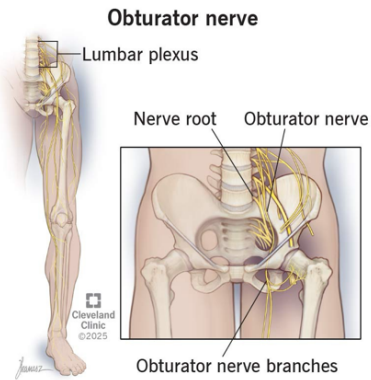
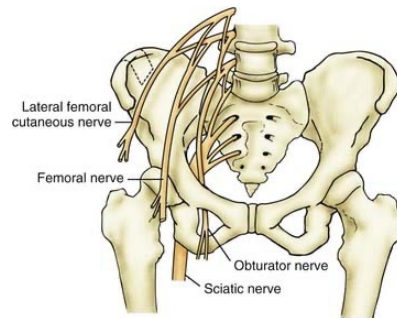
## Pelvic Nerves

Pelvis is innervated mainly by:

1. Sacral spinal nerves
2. Coccygeal nerves
3. Pelvic autonomic nervous system

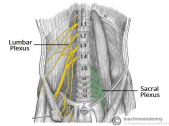
## Obturator Nerve

- Origin: L2, L3, L4.
- Runs along lateral pelvic wall to the obturator canal.
- No pelvic organs supplied by it.



## Sacral Plexus

- Located on posterolateral wall of pelvis.
- Most branches leave pelvis through greater sciatic foramen.



## Important Branches of Sacral Plexus

### 1. Sciatic Nerve

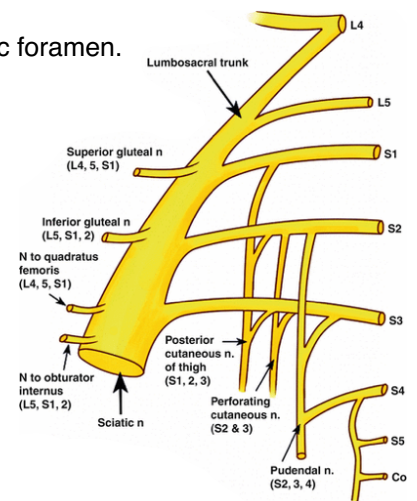
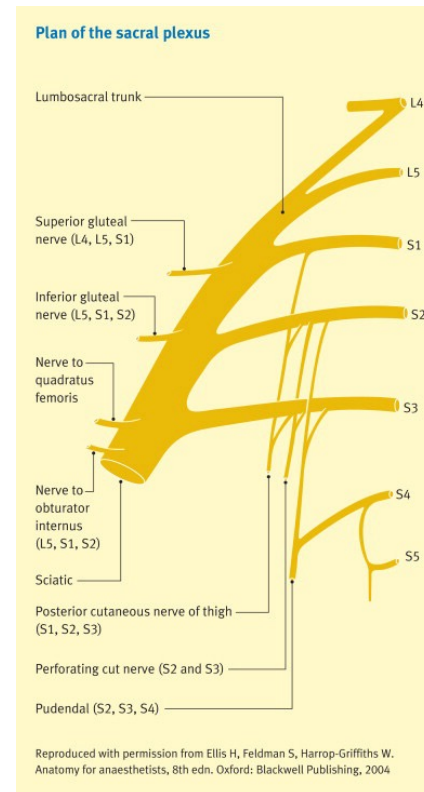
- Largest nerve in body.
- Origin: L4, L5, S1, S2, S3.
- Leaves pelvis below piriformis.
- Supplies:
  - Hip joint
  - Posterior thigh muscles
  - All muscles of leg and foot

### 2. Pudendal Nerve

- Main nerve of perineum.
- Chief sensory nerve of external genitalia.
- Origin: S2, S3, S4.
- Leaves pelvis through greater sciatic foramen and enters perineum through lesser sciatic foramen.

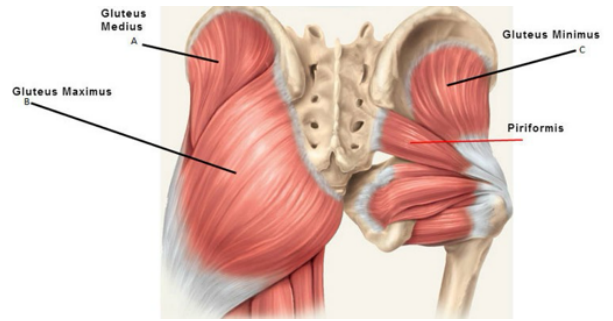
### Supplies

- Sensory to genitalia
- Perineal muscles
- External urethral sphincter
- External anal sphincter



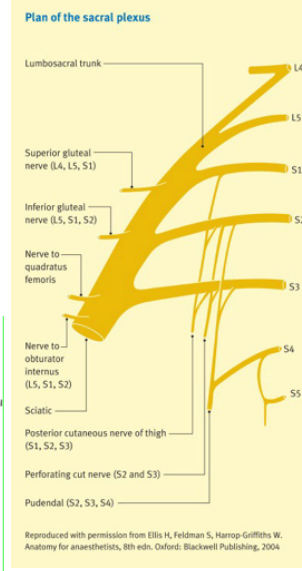
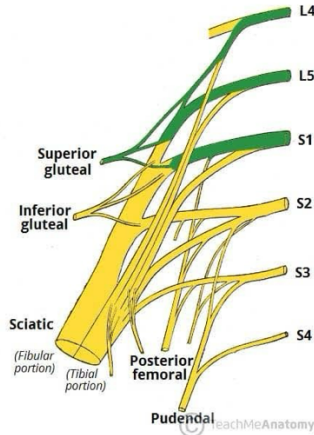
### 3. Superior Gluteal Nerve

- Origin: L4, L5, S1.
- Leaves pelvis superior to piriformis.
- Supplies:
  - Gluteus medius
  - Gluteus minimus



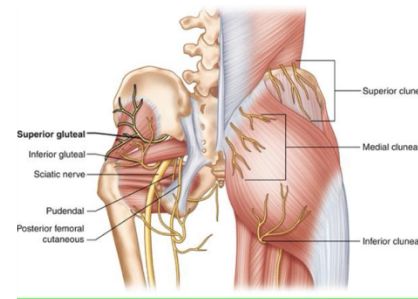
### 4. Inferior Gluteal Nerve

- Origin: L5, S1, S2.
- Leaves below piriformis.
- Supplies gluteus maximus.



### 5. Posterior Cutaneous Nerve of Thigh

- Origin: S2, S3.
- Sensory to buttock and posterior thigh skin.



## Small Muscular Branches

### Nerve to Piriformis

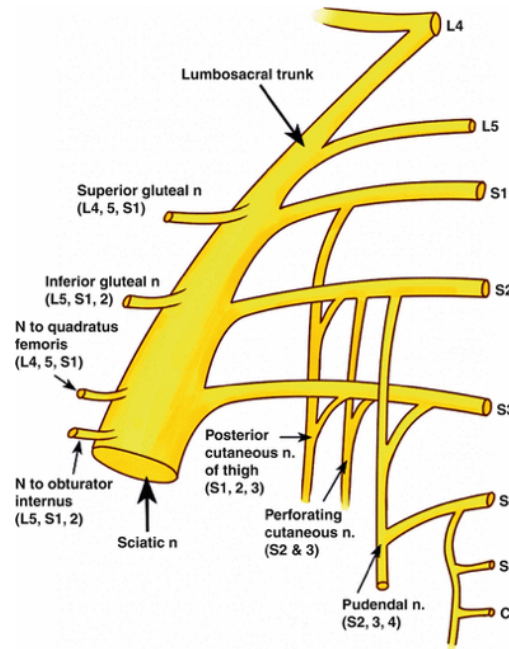
- Origin: S1, S2
- Supplies piriformis muscle.

### Nerve to Quadratus Femoris

- Origin: L4, L5, S1
- Supplies quadratus femoris + inferior gemellus.

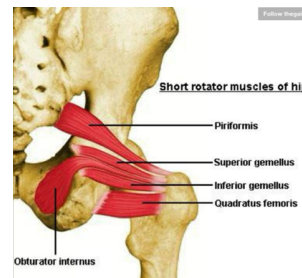
### Nerve to Obturator Internus

- Origin: L5, S1, S2
- Supplies obturator internus + superior gemellus.



## Pelvic Splanchnic Nerves

- Origin: S2, S3, S4.
- Parasympathetic supply to pelvic viscera via inferior hypogastric plexus.



## Nerves to Levator Ani & Coccygeus

- Origin: S3, S4.
- Supply levator ani and coccygeus muscles.

## Coccygeal Plexus

- Formed by anterior rami of S4, S5, coccygeal nerve.
- Supplies:
  - Coccygeus
  - Part of levator ani
  - Sacrococcygeal joint

## Anococcygeal Nerves

- Supply skin between coccyx and anus.

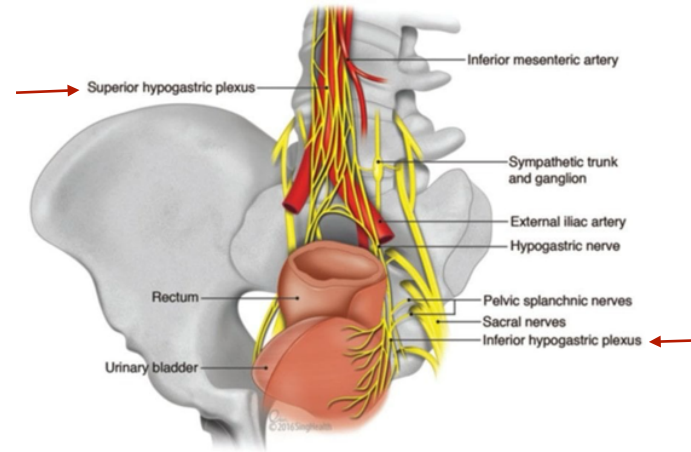
## Autonomic Nerves of Pelvis

### Superior Hypogastric Plexus

- Continuation of aortic plexus.
- Divides into right and left hypogastric nerves.

### Inferior Hypogastric Plexus

- Formed by:
  - Hypogastric nerves
  - Pelvic splanchnic nerves
- Contains sympathetic + parasympathetic fibers.



## Pelvic Sympathetic Trunk

- Crosses ala of sacrum into pelvis.
- Descends behind rectum.
- Both trunks unite in front of coccyx forming ganglion impar.

## Branches

1. Gray rami communicantes to sacral and coccygeal nerves.
2. Branches to inferior hypogastric plexus.

