

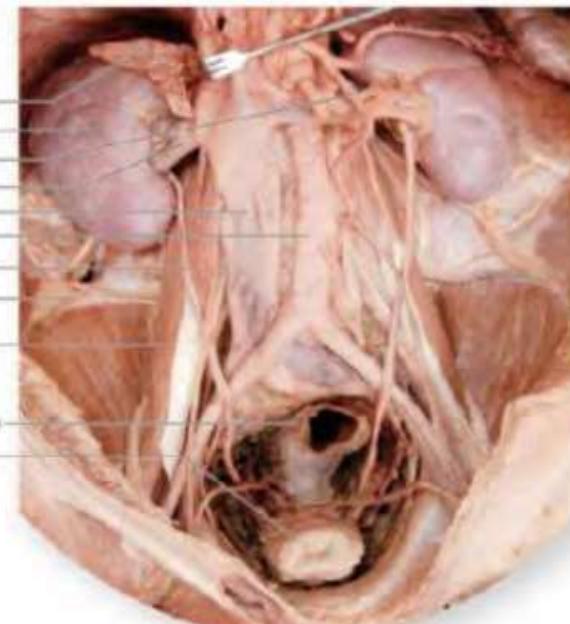
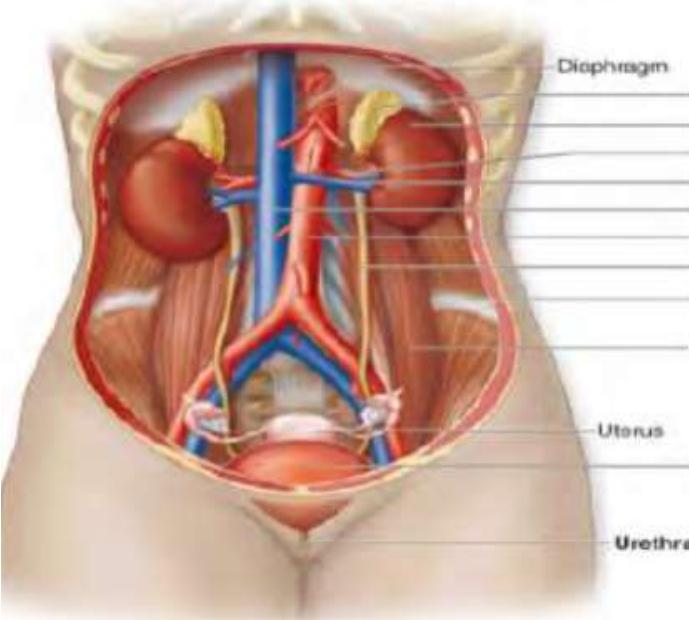
ANATOMY OF PELVICAYCEAL SYSTEM

- DR. RAHUL BEVARA

KIDNEY : ANATOMY

OVERVIEW

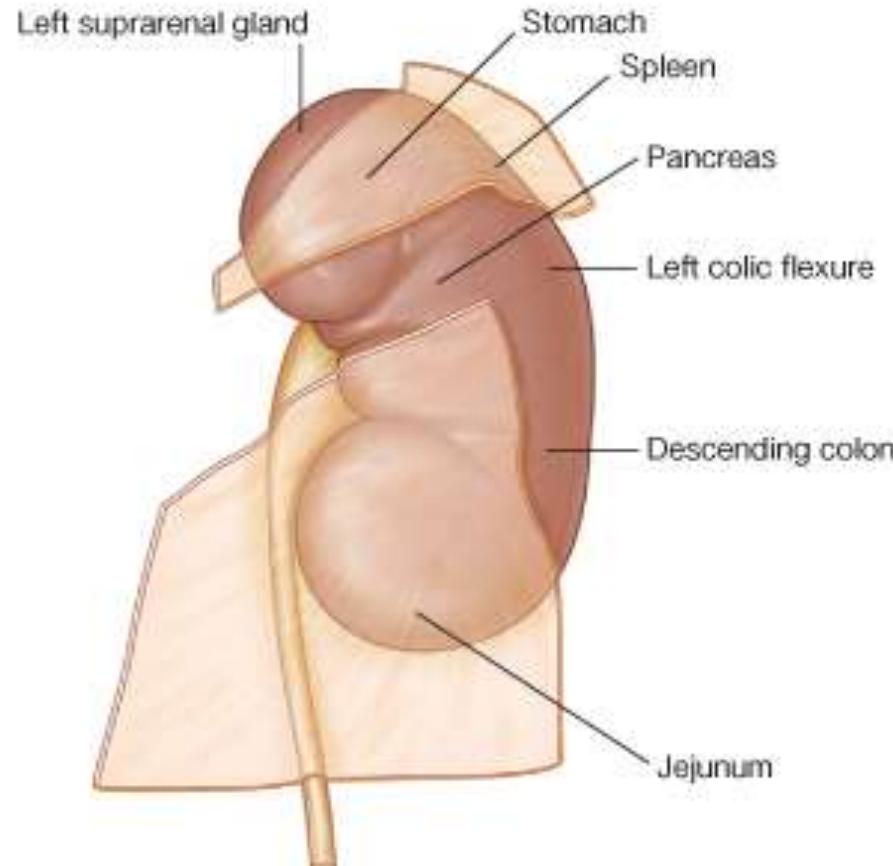
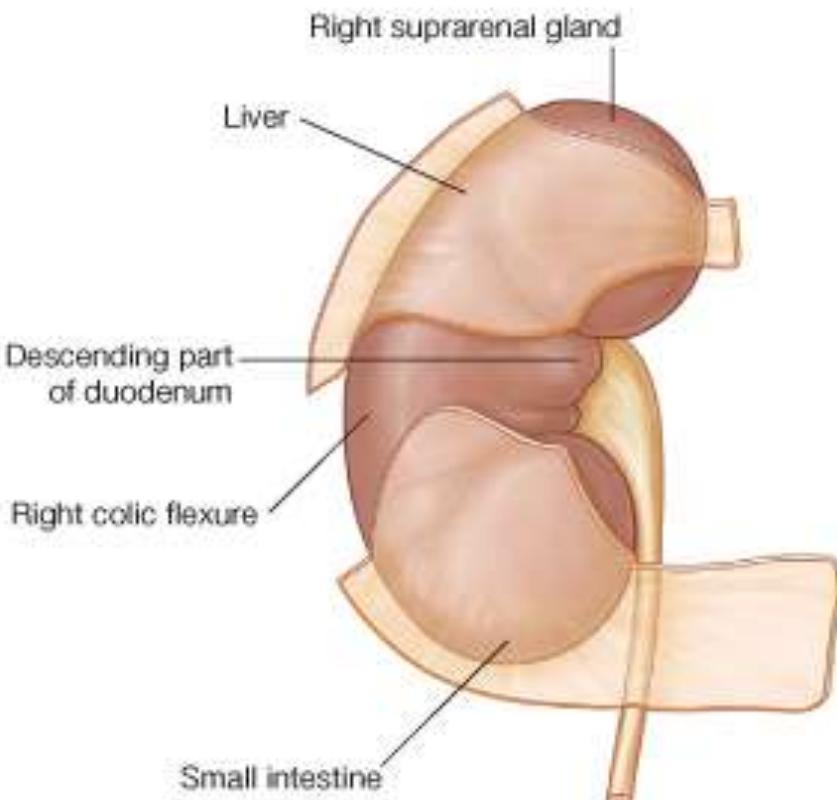
- Kidneys are retroperitoneal, in posterior abdominal region, extending from T12 – L3
- Bean-shaped
- Right kidney is lower than left kidney
- Above each kidney is a suprarenal gland, separated from kidney by a layer of fascia



RELATIONSHIPS WITH OTHER STRUCTURES

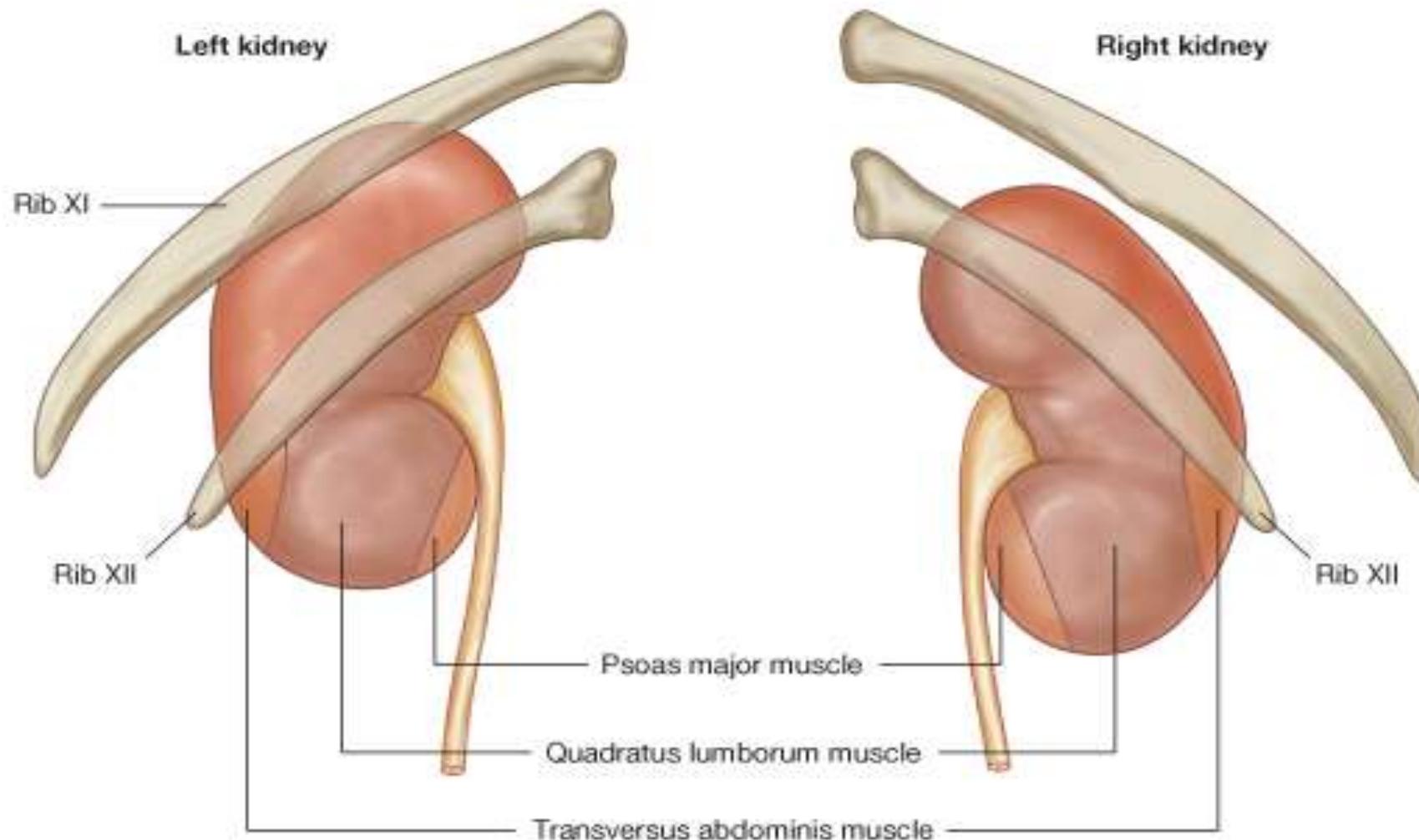
Anterior surface of each kidney is related to numerous structures

(1) Directly or (2) With an intervening layer of peritoneum



RELATIONSHIPS WITH OTHER STRUCTURES

Posterior surface of each kidney is related to the following structures.



RENAL FAT AND FASCIA

From inside to outside:

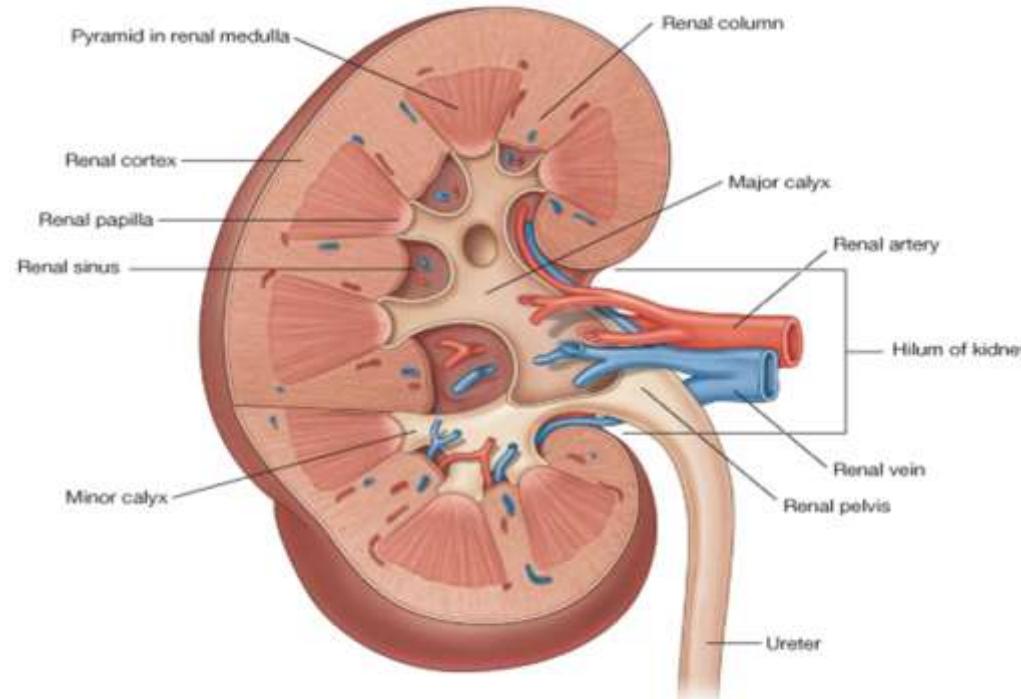
1. Renal capsule
2. Peri-nephric fat:- Extra-peritoneal fat Completely surrounds kidneys
3. Renal fascia: - Membranous condensation of Extra-peritoneal fascia
4. Para-nephric fat: - Accumulates posterior and posterolateral to kidneys

KIDNEY STRUCTURE

A. Hilum:

- On medial margin of each kidney
- Entrance and exit to renal vessels, lymphatics and nerves
- Internally continuous with Renal sinus
- Perinephric fat continues into hilum and sinus and surrounds all structures

B. Outer renal cortex: - Continuous band of pale tissue



KIDNEY STRUCTURE

C. Inner renal medulla:

- Divided into Renal pyramids
- Renal pyramids are separated by Cortical columns of Bertin
- Bases are directed outwards, towards renal cortex
- Apex (Renal papilla) are directed inwards, towards renal sinus
- Contains Ducts of Bellini
- Empty urine into Minor calyces via area cribosa
- Several minor calyces unite to form a Major calyces
- Several major calyces unite to form Renal pelvis (continuous with Ureter)

RENAL VASCULATURE

1. **Renal artery** (lateral branch of abdominal aorta, inferior to origin of superior mesenteric artery L1-L2).

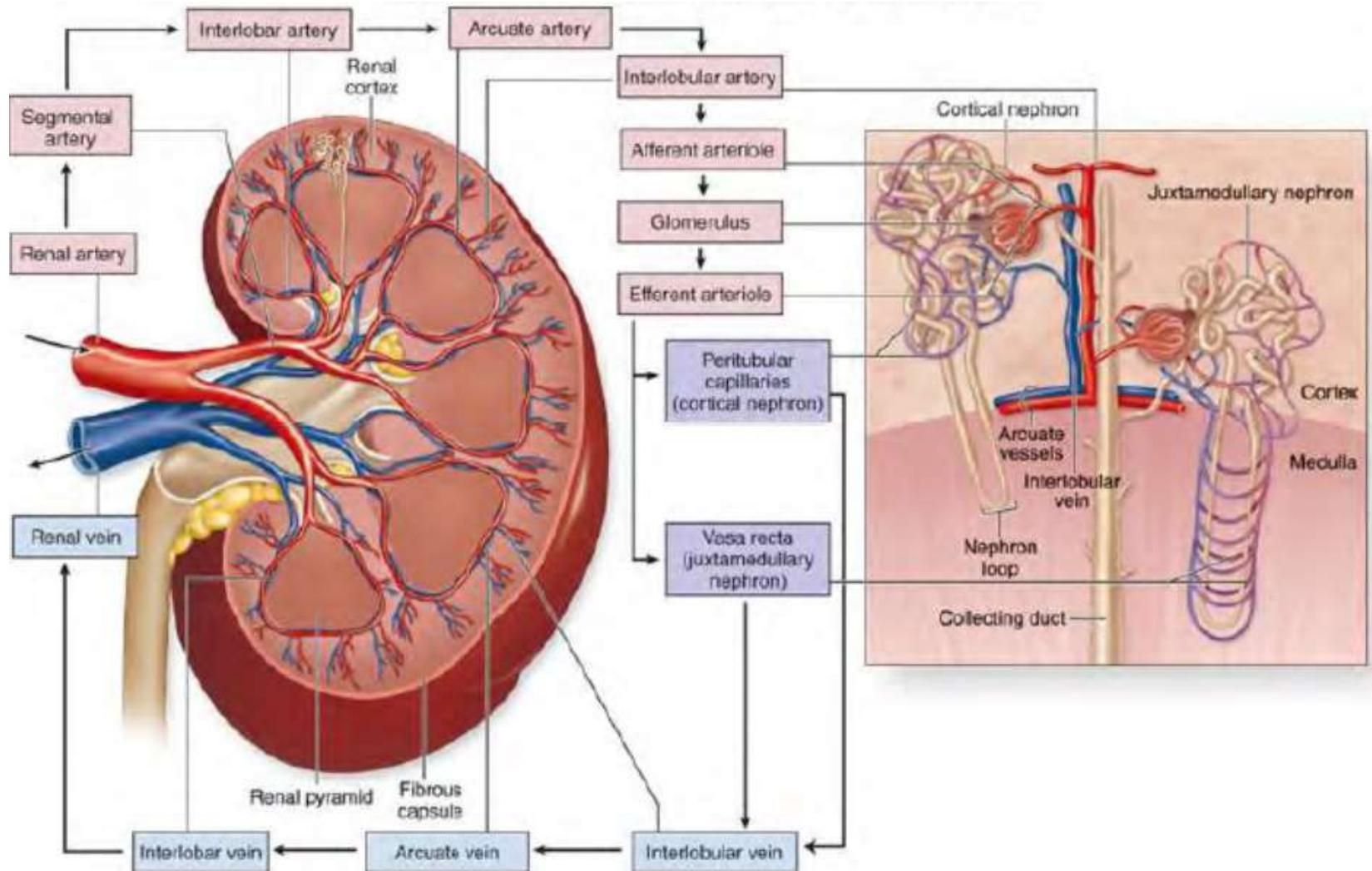
10% of the total blood volume to each kidney

Right renal artery is longer, passes posterior to IVC

Renal artery divides into 5 separate Segmental arteries:

- Supply different segments of kidneys
- Do not anastomose with each other
- I.e. Result in distinct vascular segmentation of kidney, with each being surgically resectable

RENAL VASCULATURE



- Renal veins drain into the IVC

RENAL INNERVATION

A. OUTPUT: Visceral efferent fibres

Sympathetic nervous system: via Renal plexus

Formed by filaments from: (1) Coeliac plexus

(2) Aorticorenal ganglion

(3) Aortic plexus

- Joined by the least splanchnic nerve
- Enter kidney alongside renal artery
- Triggers renal vasoconstriction, reducing renal blood flow

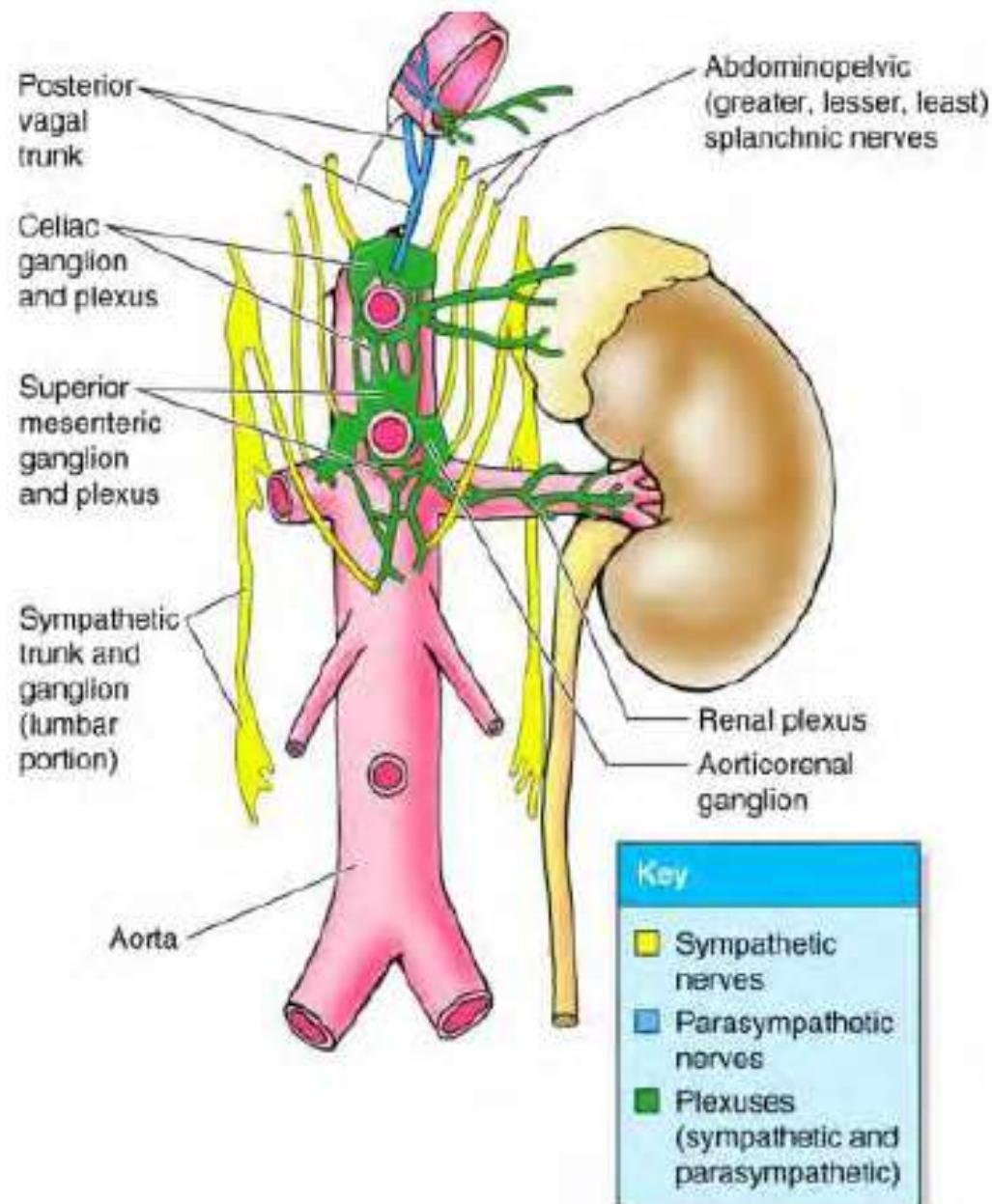
B. INPUT: Visceral afferent fibres

Parasympathetic nervous system

Sensory Input:

- Follow sympathetic fibres, entering spinal cord at T11-L2

RENAL INNERVATION

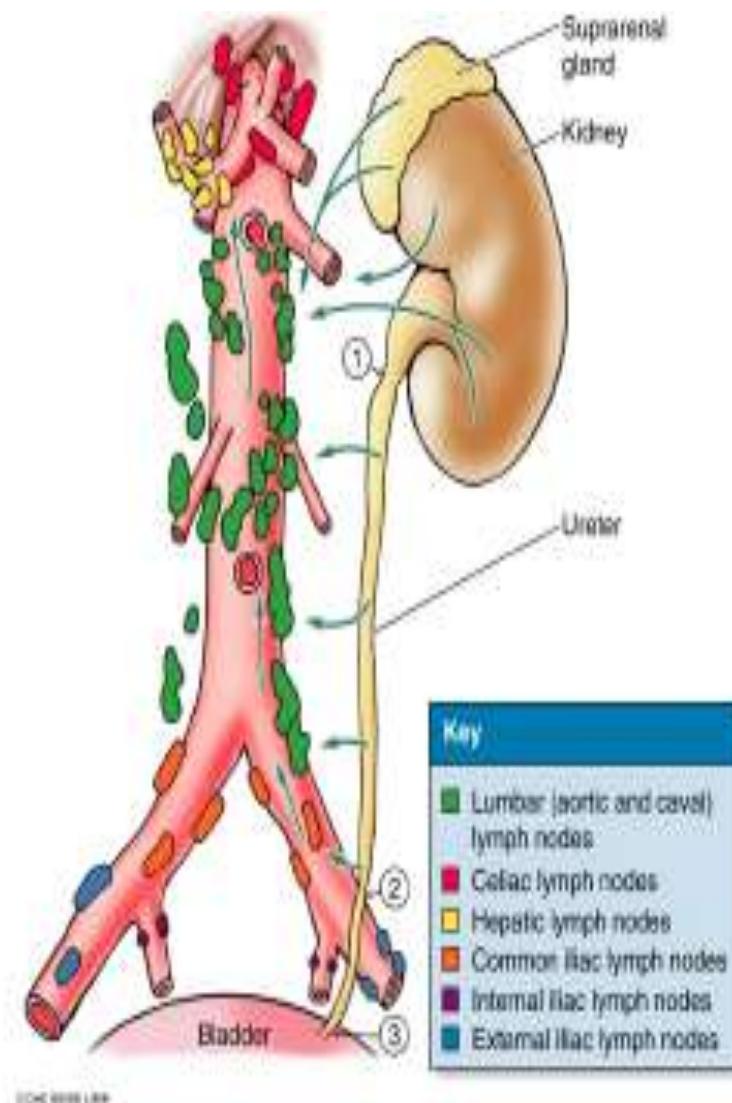


RENAL LYMPHATICS

Most renal lymphatic drainage is into

Lumbar lymph nodes

(surround abdominal aorta)



URETERS : ANATOMY

A. OVERVIEW

Ureters: - Muscular tubes - Transport urine from kidneys to bladder

Superiorly continuous with renal pelvis at Ureteropelvic junction.

Inferior to this junction, ureters descend retroperitoneally on medial aspect of psoas major.

On pelvic prim, ureters cross end of Common iliac arteries, entering pelvic cavity > Bladder

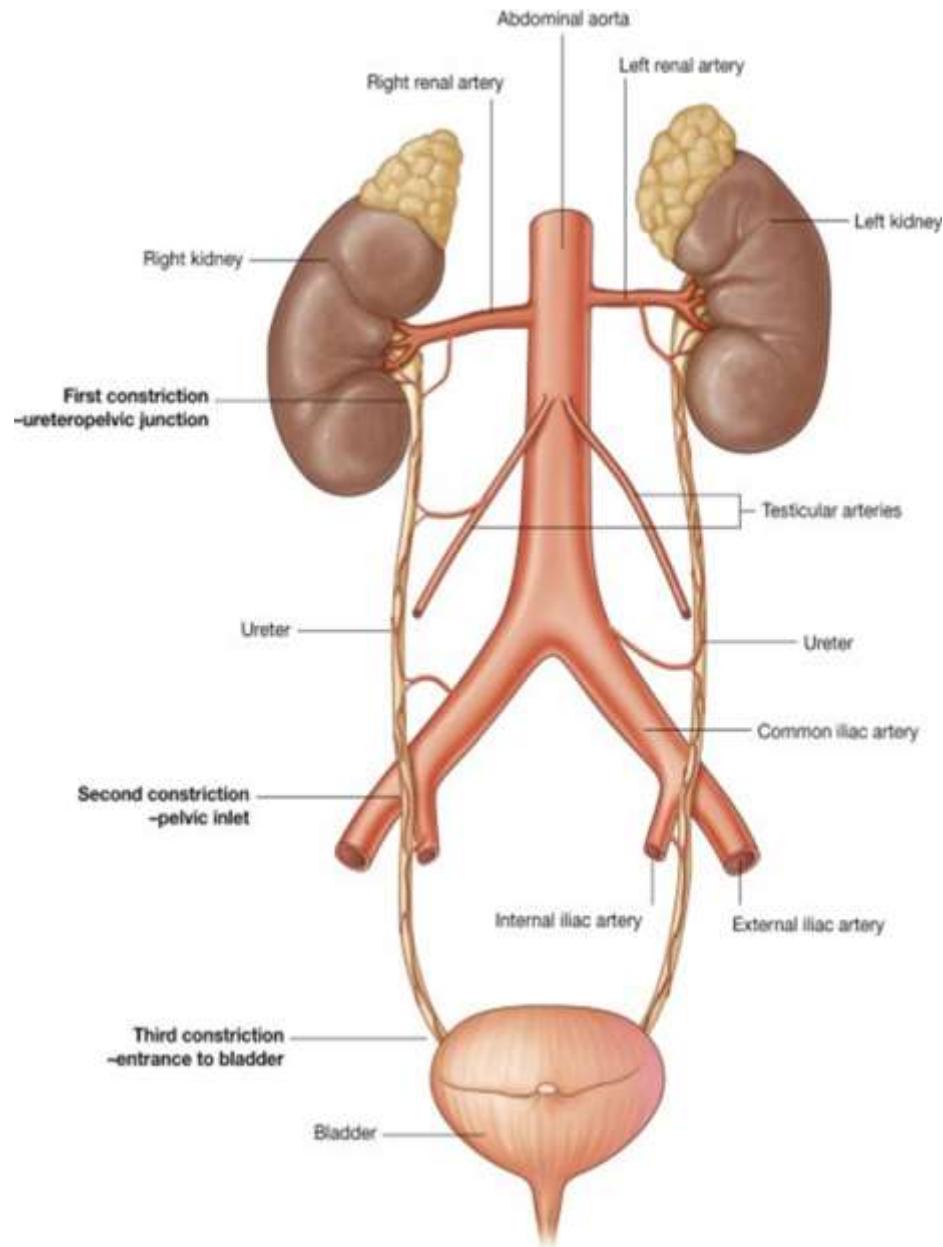
URETERS : ANATOMY

B. CONSTRICION OF THE LUMEN

There are 3 points along course of ureters where their lumen is constricted:

- (1) Ureteropelvic junction
- (2) Pelvic inlet
- (3) Entrance of bladder wall

Kidneys stones can get lodged at these constrictions



URETERS: ANATOMY

C. URETERIC VASCULATURE

Ureters receive arterial branches from adjacent vessels as they pass towards the bladder:

- (1) Upper end: Supplied by renal arteries
- (2) Middle part: Supplied by - abdominal aorta - testicular/ovarian arteries - common iliac arteries
- (3) In pelvic cavity: Supplied by internal iliac arteries

URETERS : ANATOMY

URETERIC INNERVATION

Involves (1) Renal (2) Aortic (3) Superior Hypogastric (4) Inferior Hypogastric plexuses

Visceral efferent fibres: From sympathetic and parasympathetic sources

Visceral afferent fibres: Return to T11-L2 spinal cord

I.e. **Ureteric pain** is referred to cutaneous area supplied by T11-L2, including:

- Posterior & Lateral abdominal wall (below ribs and above iliac crest)
- Pubic region - Scrotum in males/Labia majora in females
- Anterior aspect of the proximal thigh.

THANK YOU