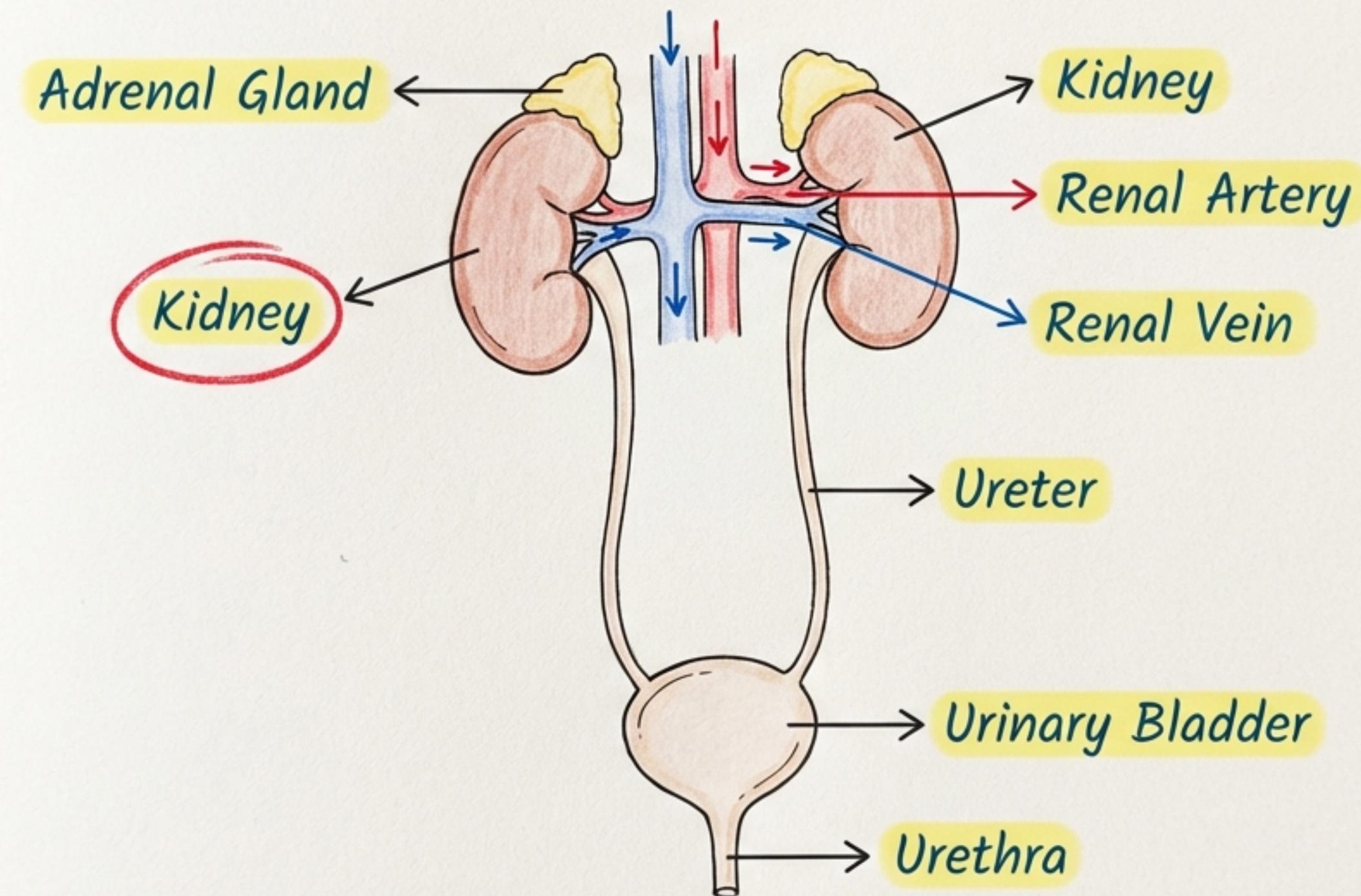


ANATOMY OF THE URINARY SYSTEM

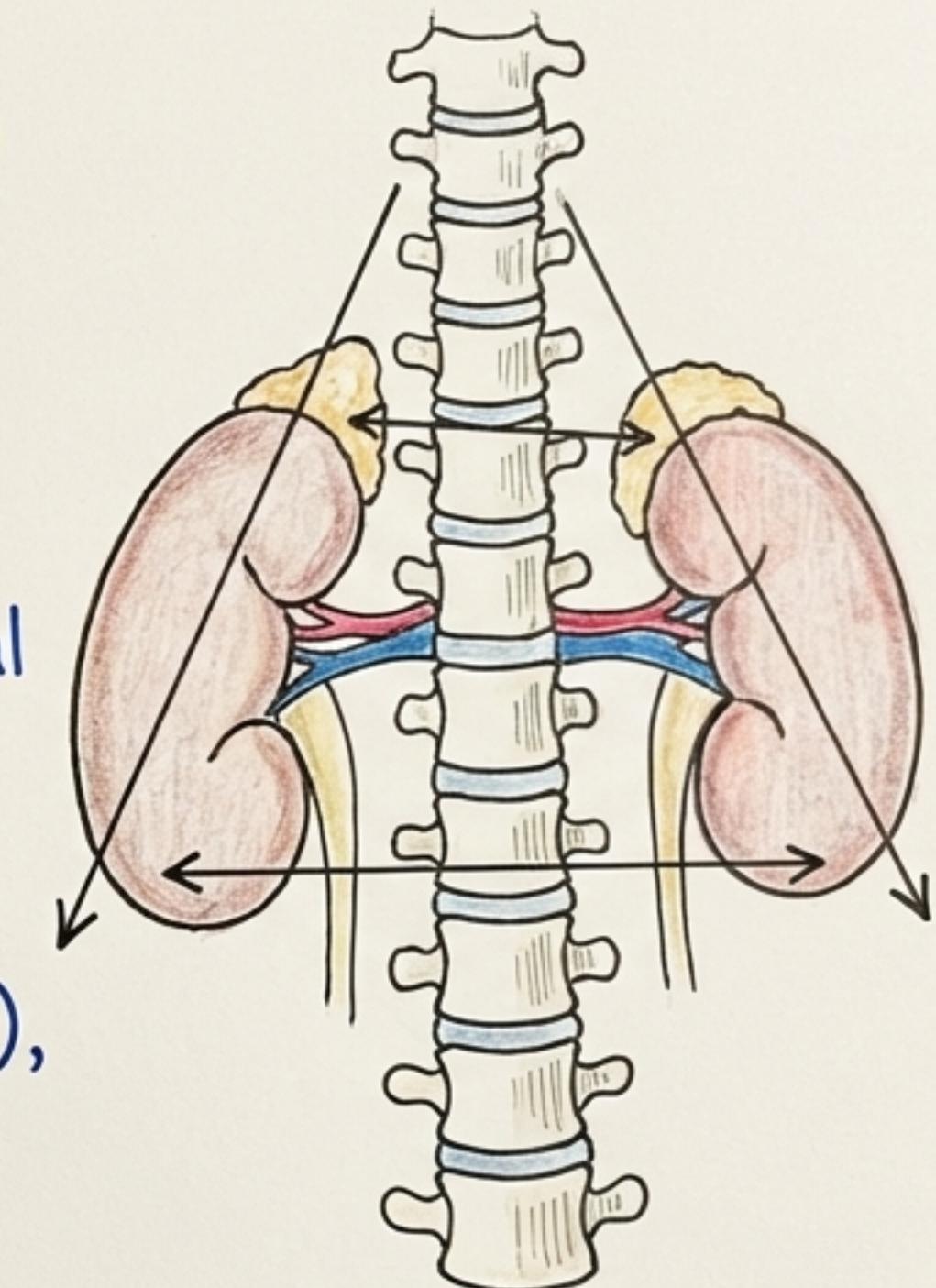
Quick Revision Notes - Kidney, Ureter, Bladder & Urethra



THE KIDNEY - BASIC ANATOMY & FUNCTION

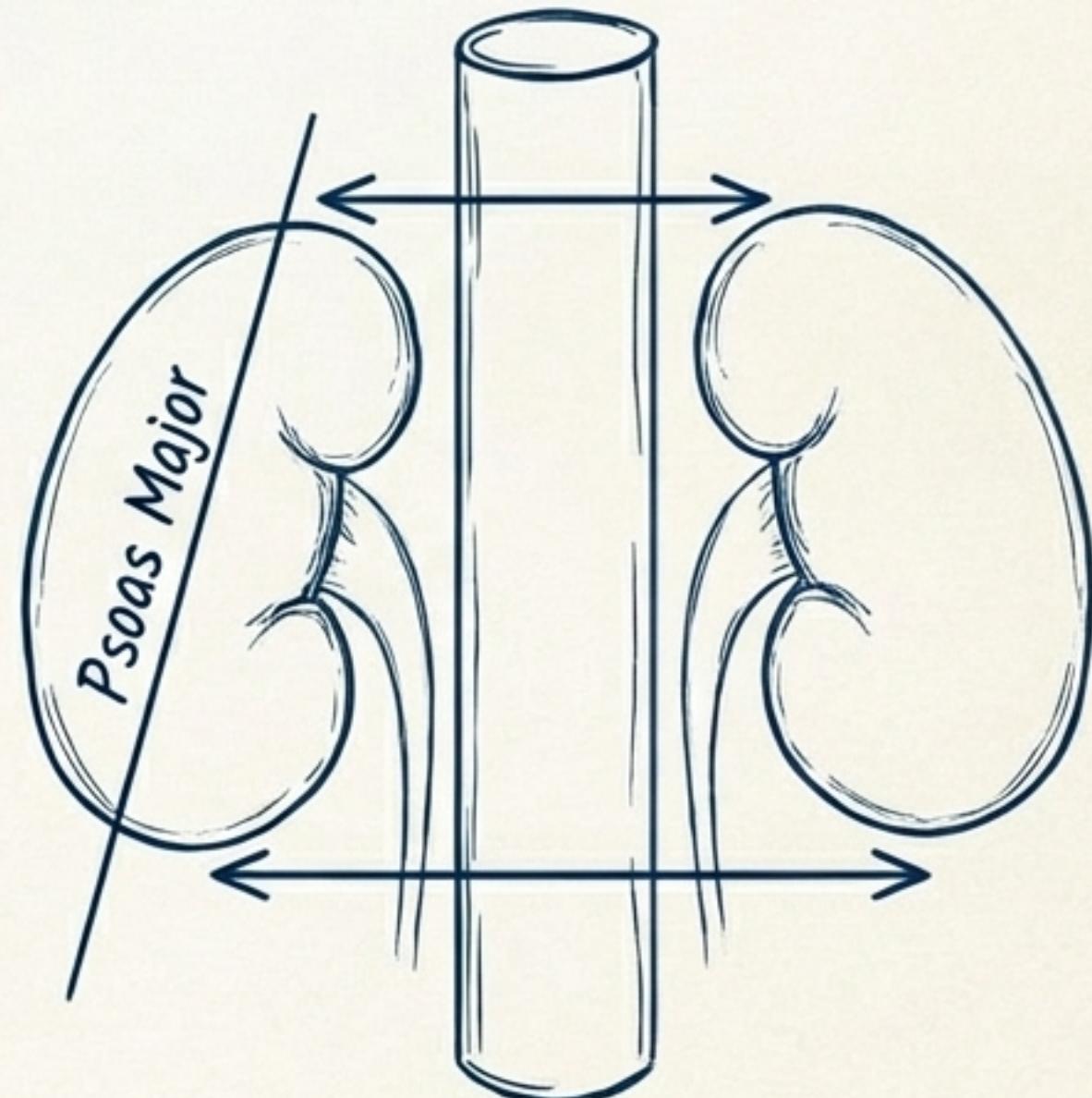
- Main job is filtration and regulation.
- **Excretory Function** : Removes waste like **Urea** and **Creatinine**.
- **Regulatory Function** : Balances electrolytes (Na, K, Ca) and water.
- **Position**: **Retro-peritoneal** on posterior abdominal wall.

Retroperitoneal
= Behind the peritoneum lining of the abdomen.
- **Shape**: Bean-shaped, reddish-brown colour.
- **Poles**: Broad upper pole (with suprarenal gland), pointed lower pole.
- **Axis**: Lies obliquely, parallel to psoas major muscle.



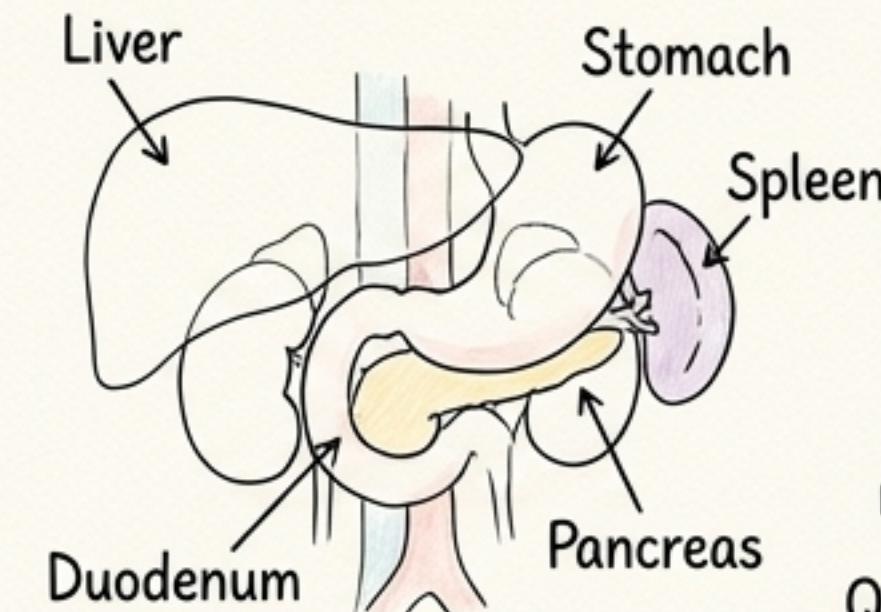
Position & Orientation

- * Each kidney lies **obliquely**.
- * Long axis is parallel to the lateral border of **Psoas Major Muscle**.
- * This means: **Upper poles are closer to the midline.**
- * **Lower poles are farther apart.**

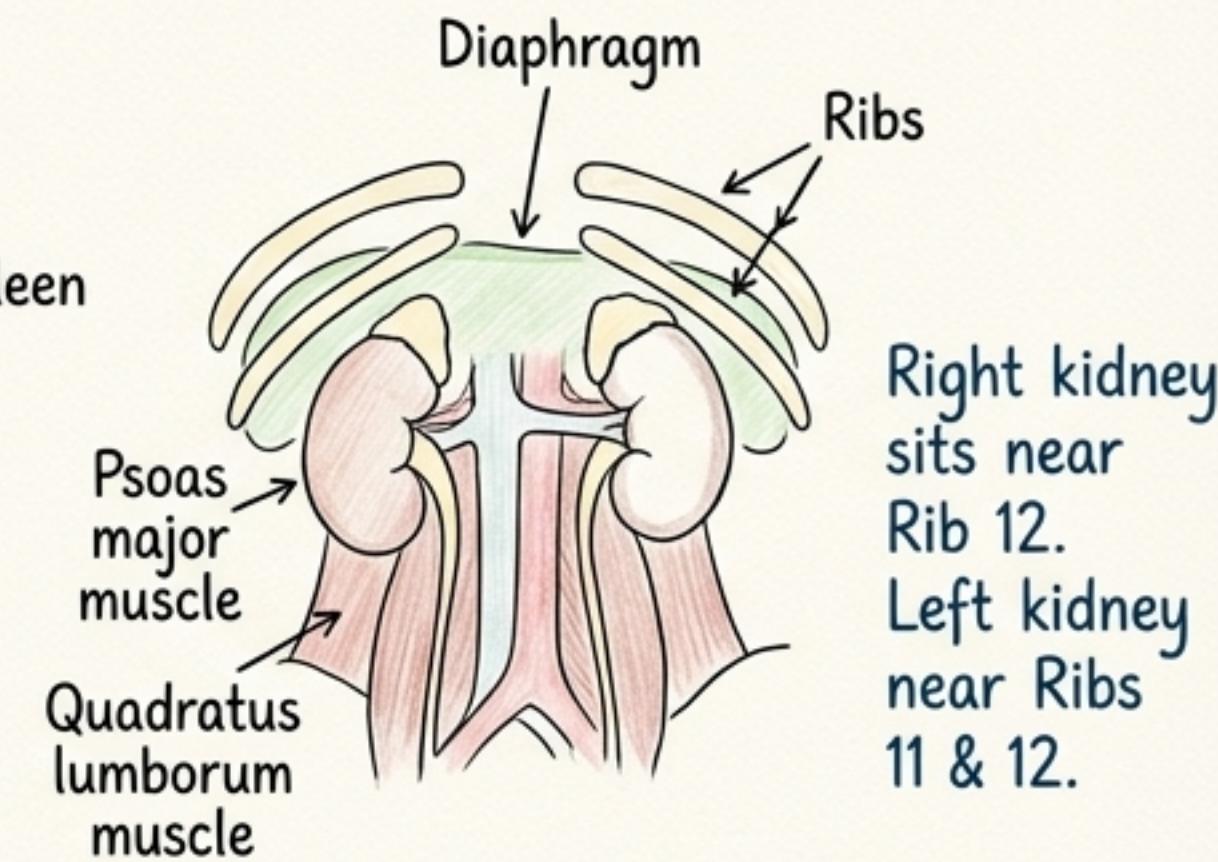


RELATIONS OF THE KIDNEY

- **Vertebral Level:** Extend between T12 and L3.
- Right Kidney is slightly lower than the left because of the liver
- Posterior relations include:
 - Diaphragm
 - Psoas major muscle
 - Quadratus lumborum muscle
 - Transversus abdominis muscle
- Anterior relations are different for each kidney (see diagram).



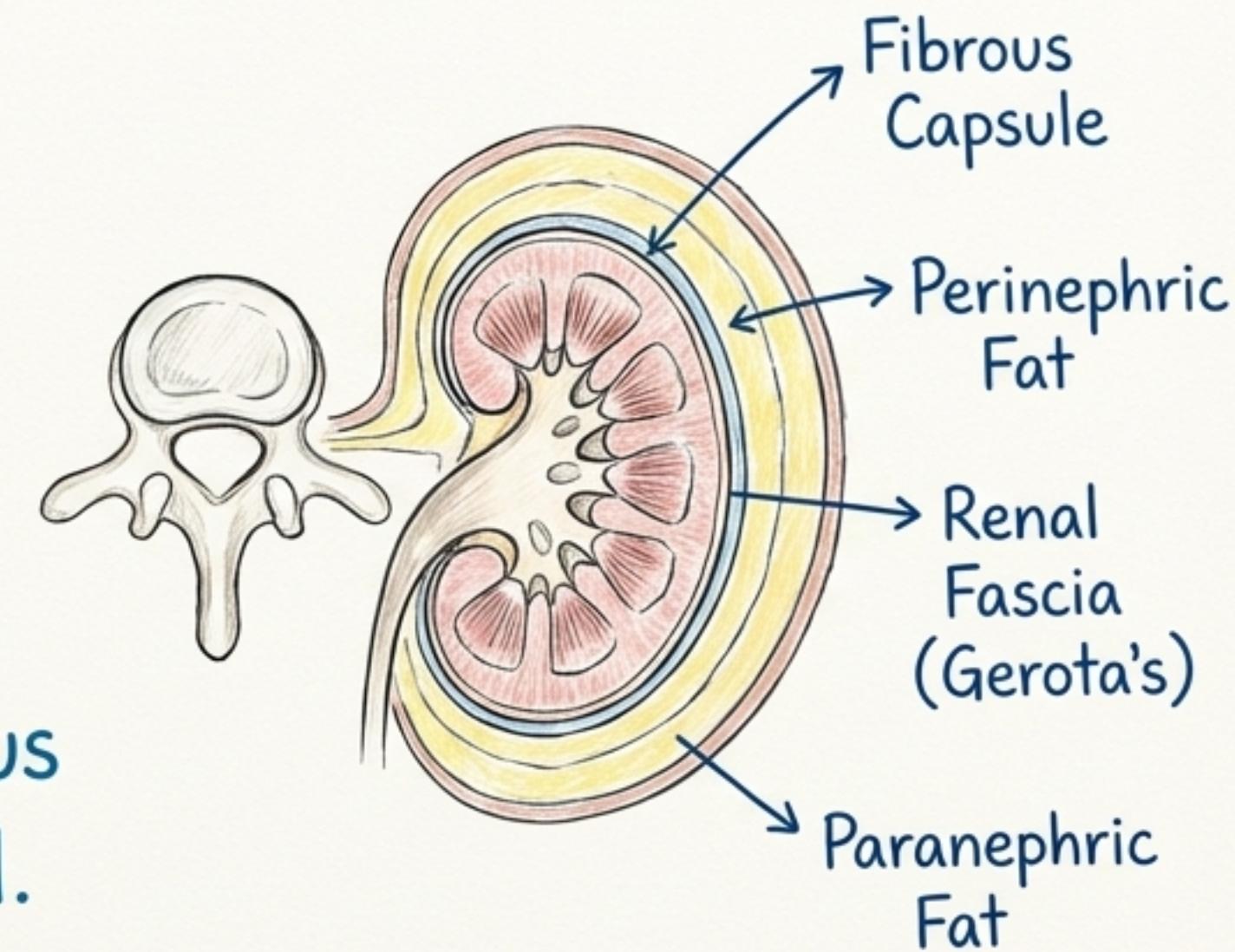
Anterior Relations



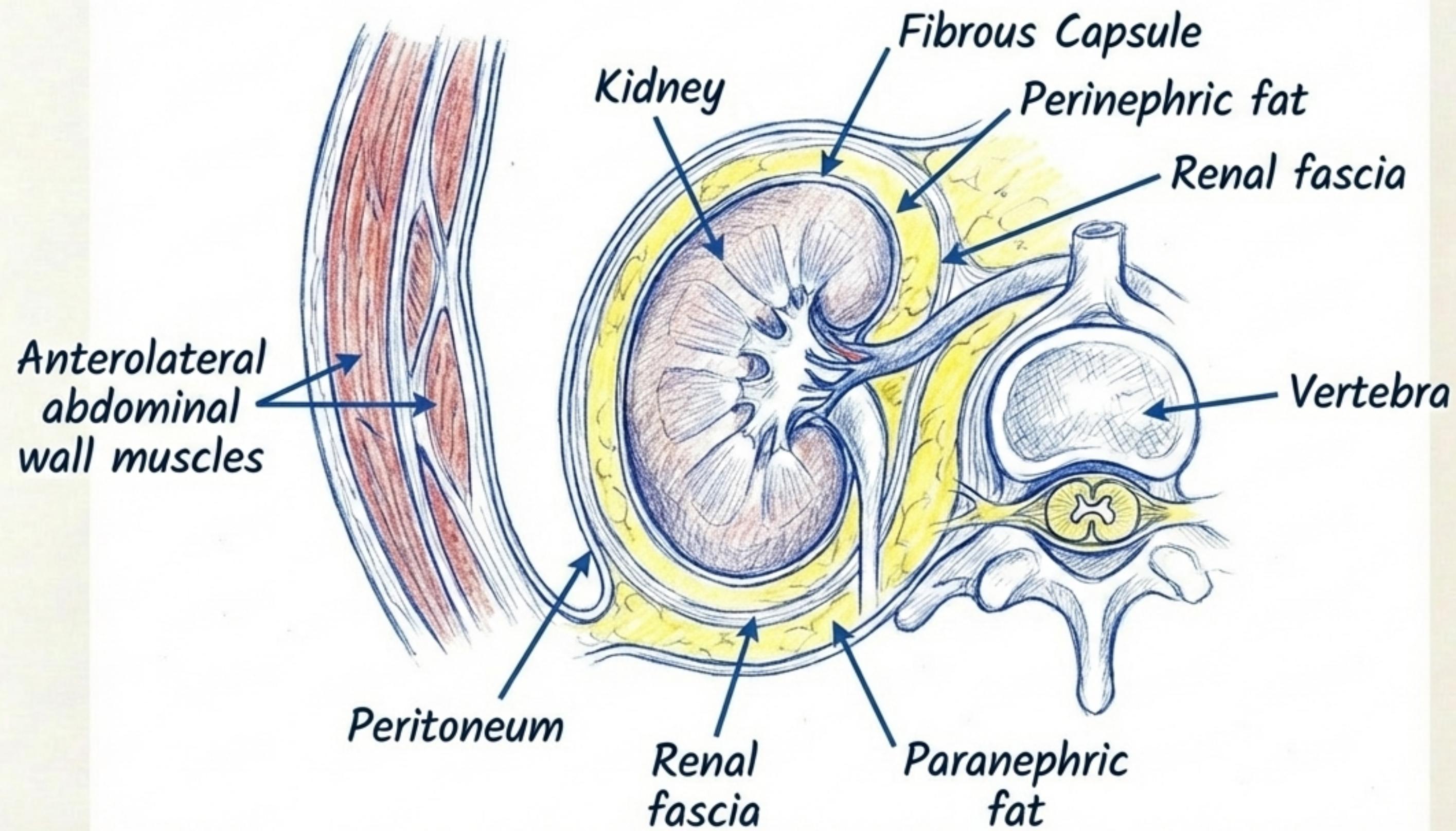
Posterior Relations

COVERINGS OF THE KIDNEY (INSIDE TO OUT)

1. **Fibrous Capsule**: Thin, innermost layer, adheres to kidney surface.
2. **Perinephric Fat**: Layer of fat surrounding the capsule.
3. **Renal Fascia (Gerota's Fascia)**: Fibrous sheet enclosing kidney & adrenal gland.
4. **Paranephric Fat**: Outermost layer of fat, acts as a cushion.

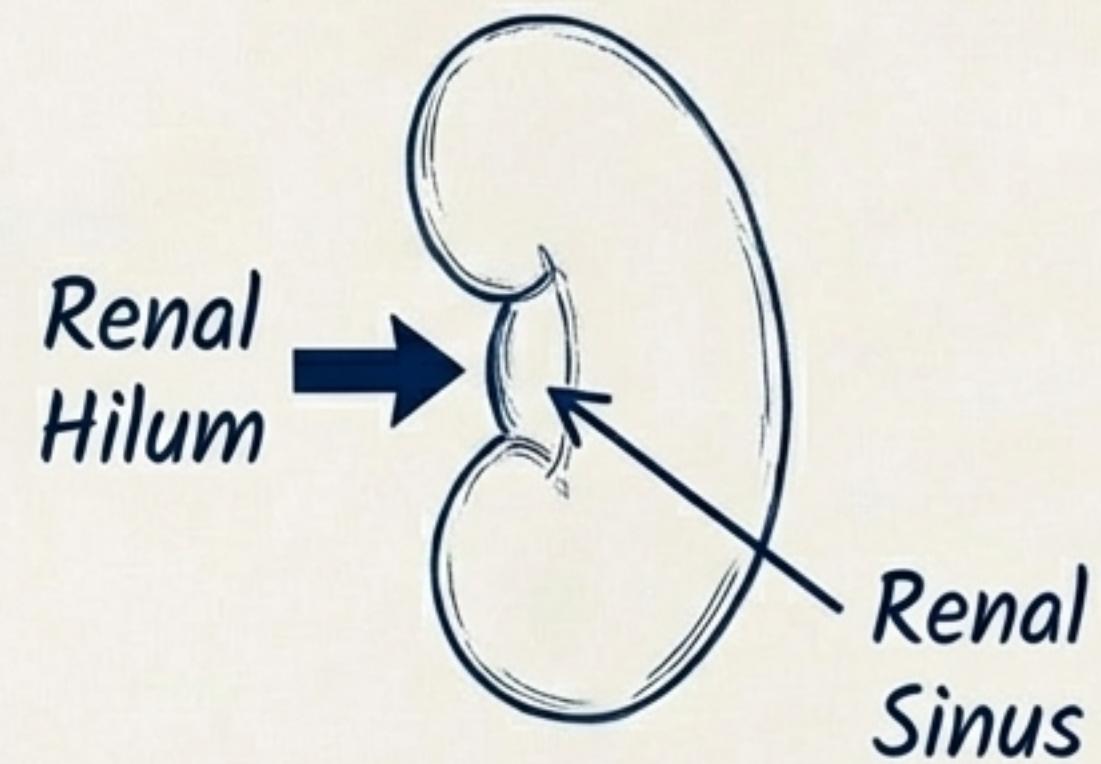


The Layers Visualized



The Renal Hilum - Gateway to the Kidney

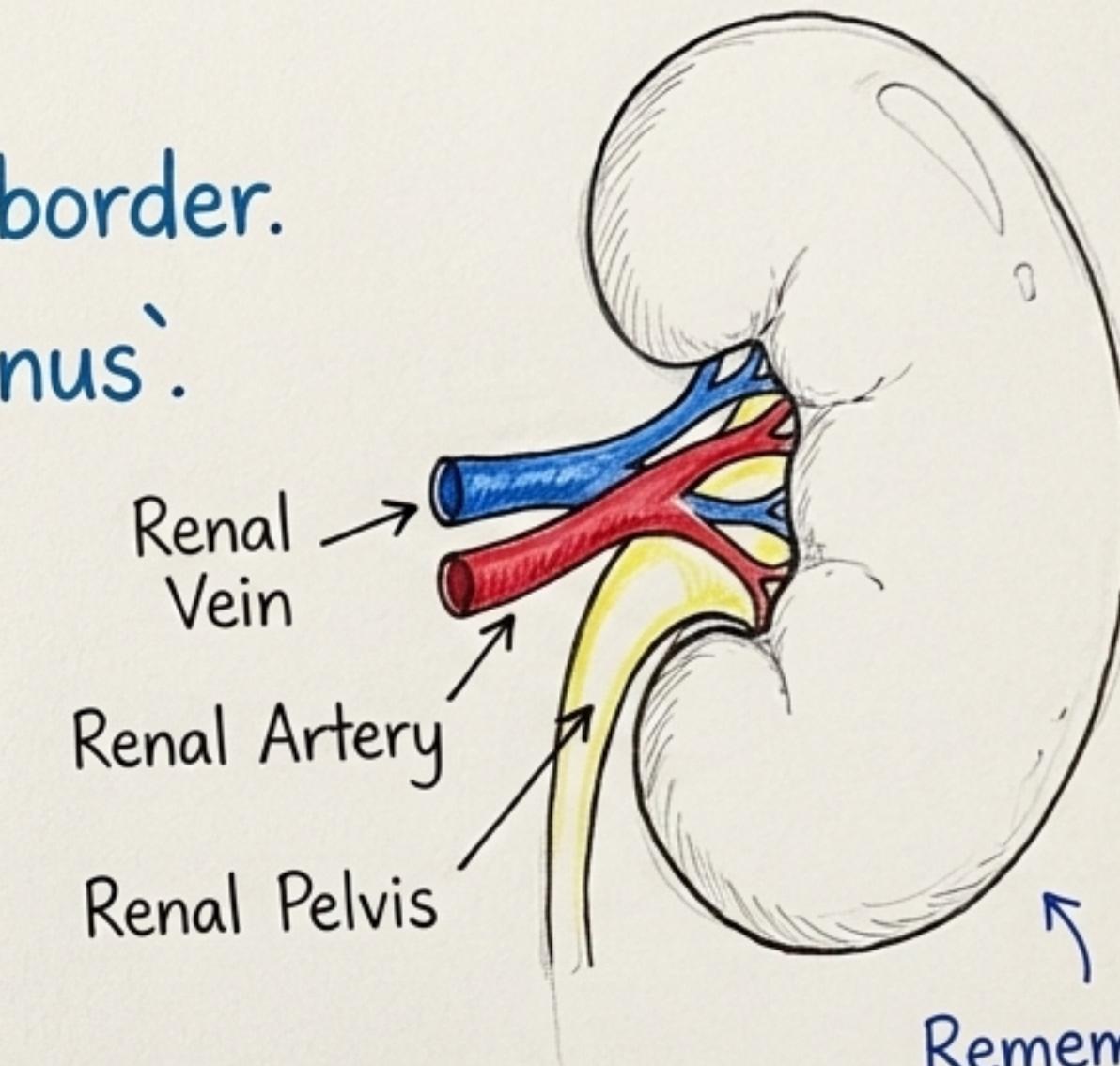
- * It is a vertical slit-like opening.
- * Located on the medial (inner) concave border of the kidney.
- * Acts as a gateway for structures to enter & leave the kidney.
- * The space inside the hilum is called the Renal Sinus.



RENAL HILUM - THE GATEWAY

- A vertical slit on the medial (concave) border.
- Leads into a space called the 'Renal Sinus'.
- Structures pass through in a specific order (front to back):

1. Renal **Vein**
2. Renal **Artery**
3. Renal **Pelvis**



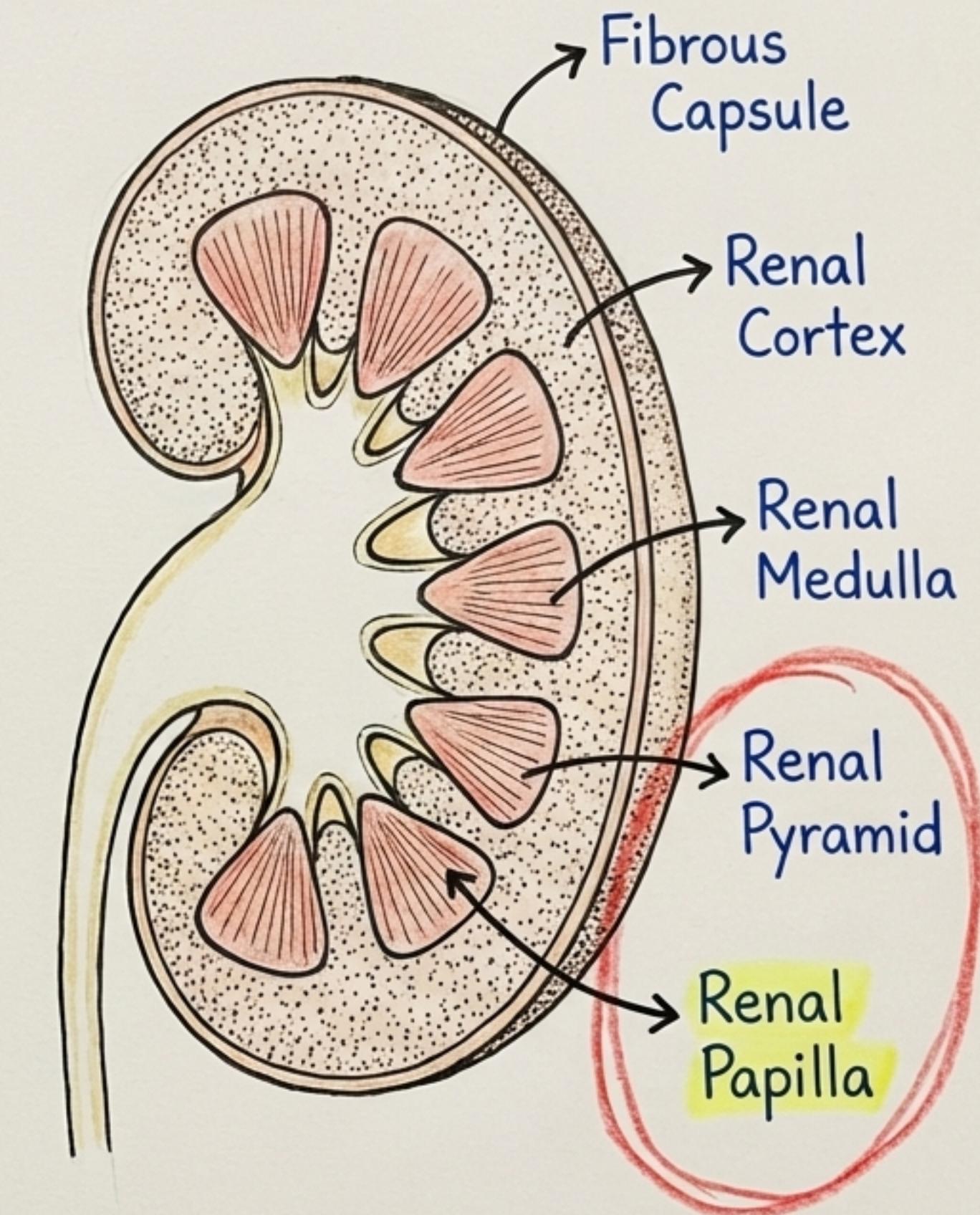
Remember
VAP! Very
Important
Point for
viva!

V - A - P (Anterior → Posterior)

INSIDE THE KIDNEY – INTERNAL STRUCTURE

Cortex = Filtering.
Medulla = Collecting & Concentrating.

- **Renal Cortex**: Outer granular layer, just under the capsule.
 - ↳ Contains the 'Nephrons' (functional units for filtering blood).
- **Renal Medulla**: Inner portion, made of Renal Pyramids.
 - ↳ **Renal Pyramids**: Cone-shaped structures.
 - ↳ Base faces cortex, Apex (called 'Renal Papilla') points inwards.



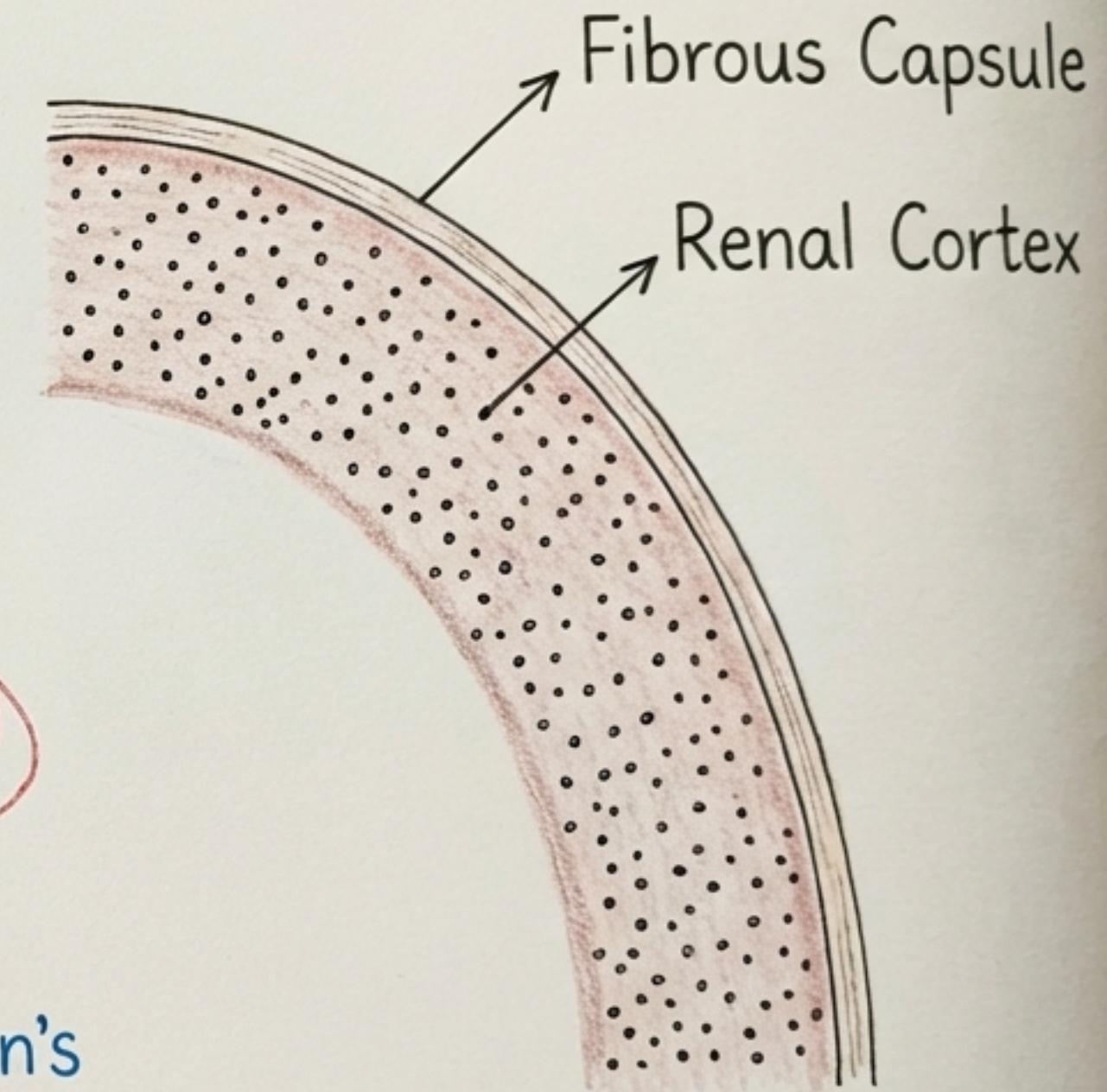
Step 1: The Renal Cortex (The Outer Layer)

- Outer granular layer, just under the capsule.
- This is where blood is filtered.
- Contains the **Nephrons**.

• Nephrons are the functional units that filter blood and produce urine.

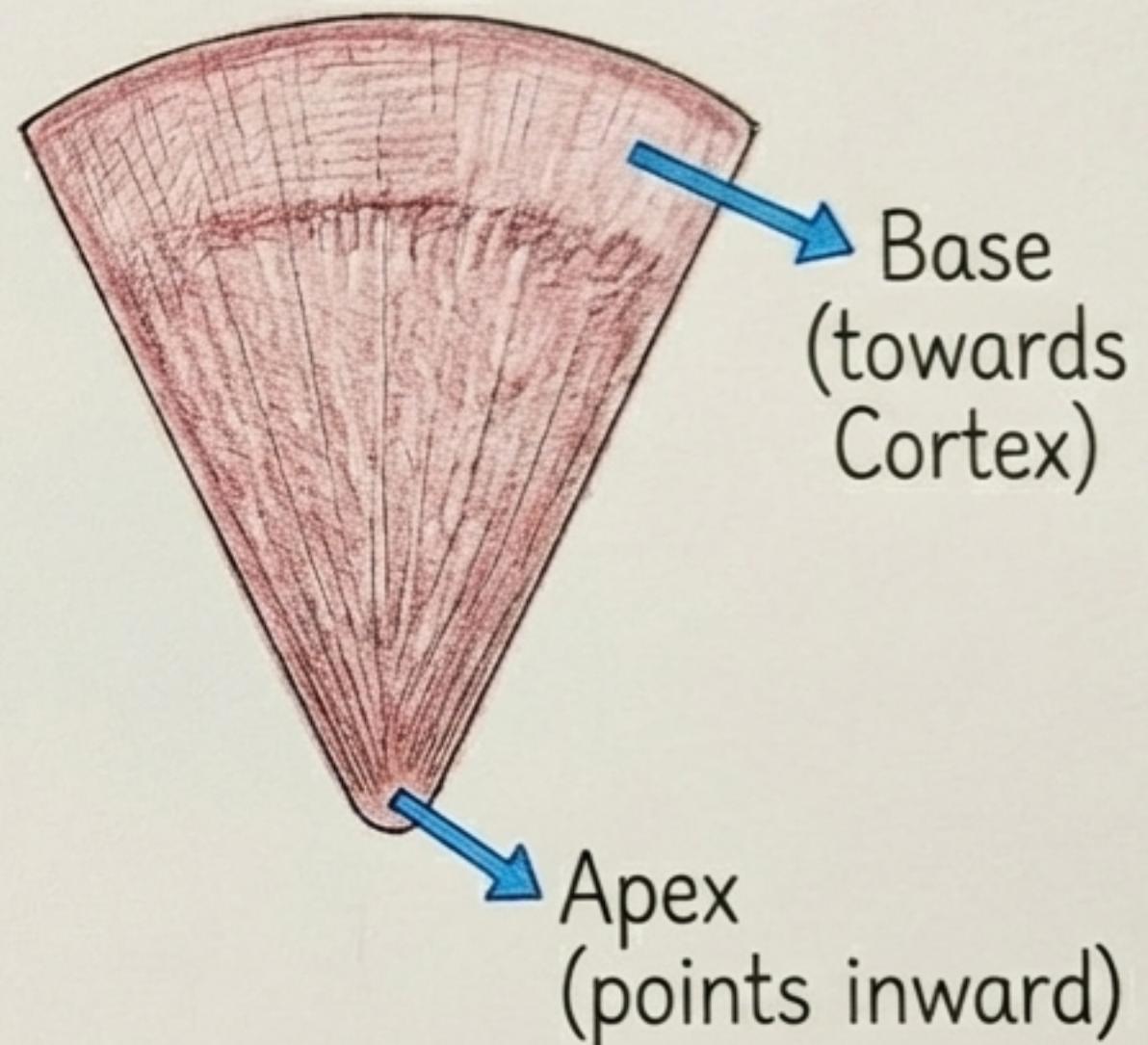
Exam point!

- Also contains Renal Corpuscle (Bowman's Capsule) & Renal Tubules.



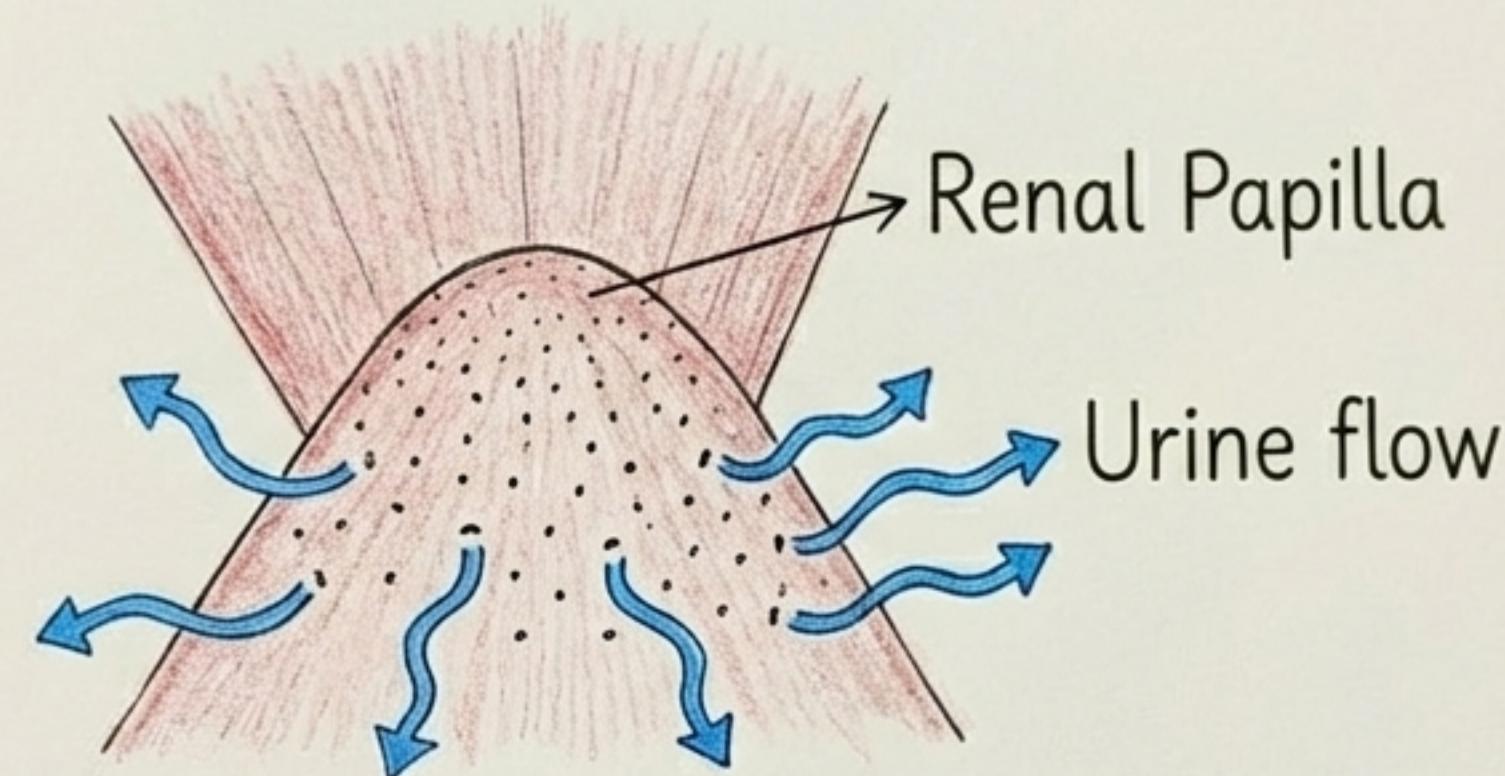
Step 2: Into the Renal Medulla

- The inner part of the kidney.
- It is made up of Renal Pyramids.
- Pyramids are cone-shaped structures.
- Base of pyramid faces the cortex.
- Apex (tip) points inwards.
- Main job: Transport urine towards the center.



Think of them like funnels pointing to the middle.

Step 3: The Renal Papilla (Tip of the Pyramid)

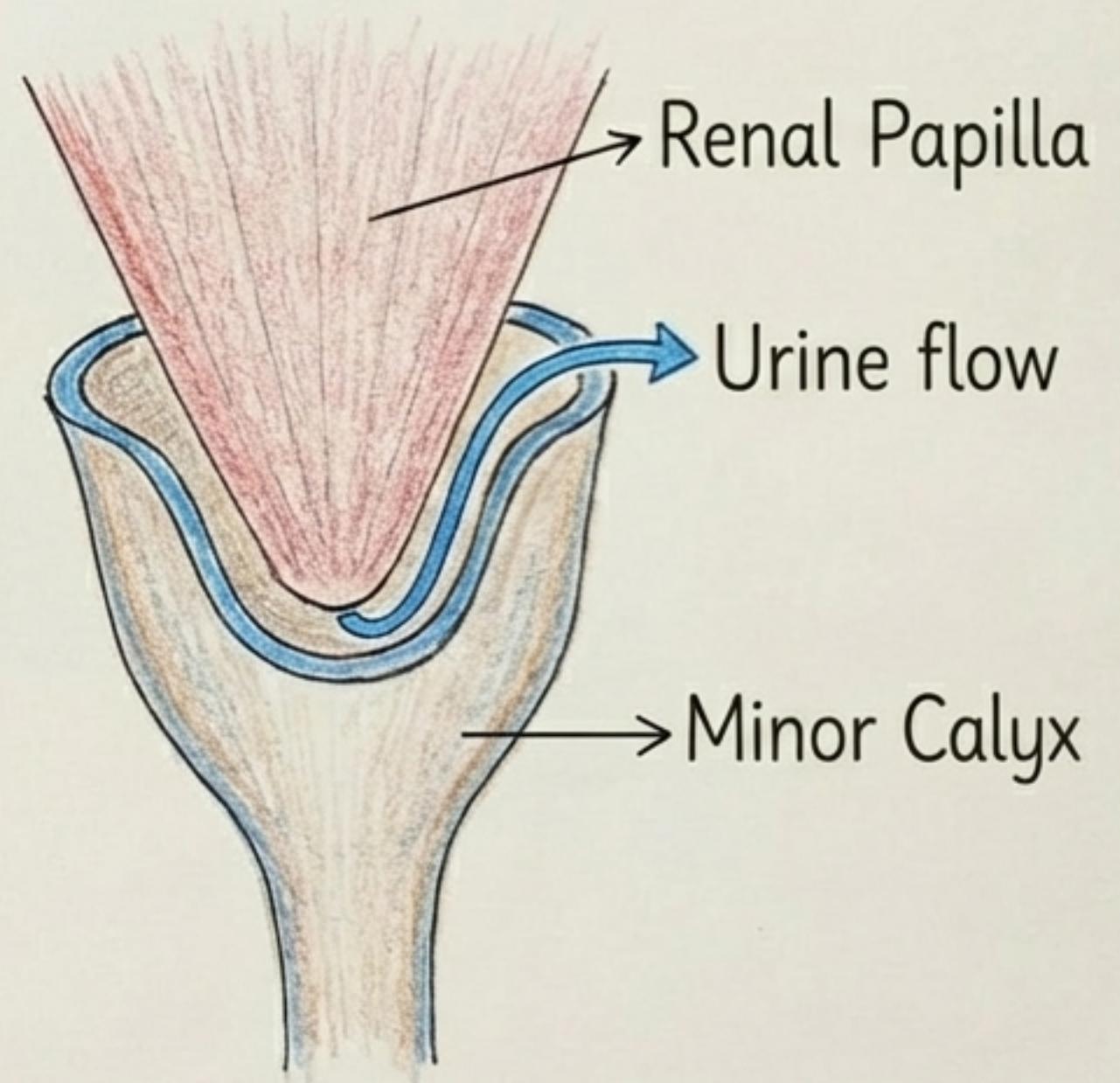


- The Renal Papilla is the apex (tip) of each renal pyramid.
- It has small openings.
- These openings are called **ducts of Bellini**.
- Urine drains through these ducts into the next part.

Papilla = “nipple”
in Latin. It’s the
pointy tip!

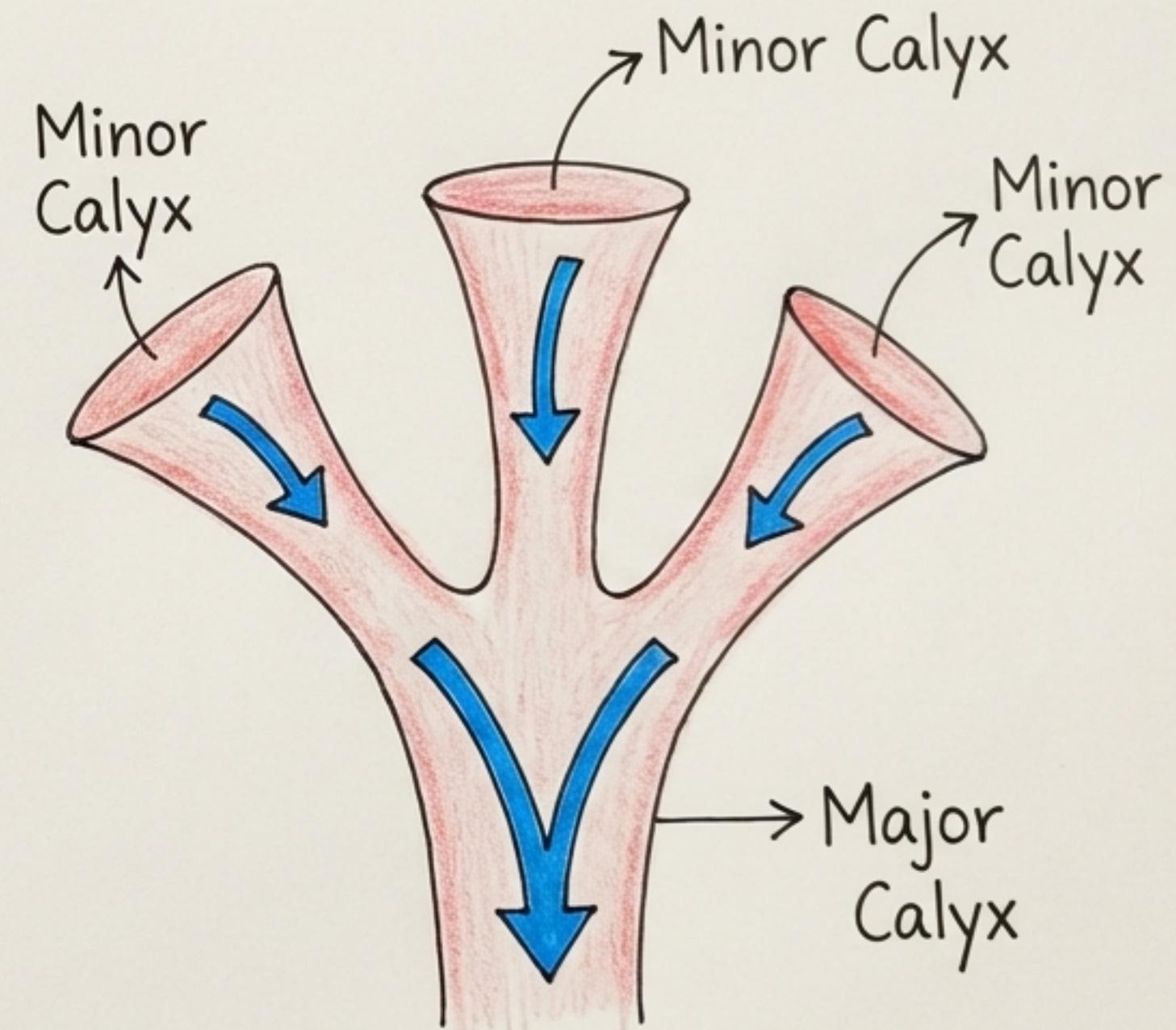
Step 4: First Stop - The Minor Calyx

- Small, cup-shaped structures.
- They are located in the renal sinus (the central cavity).
- Each minor calyx collects urine from one renal papilla.



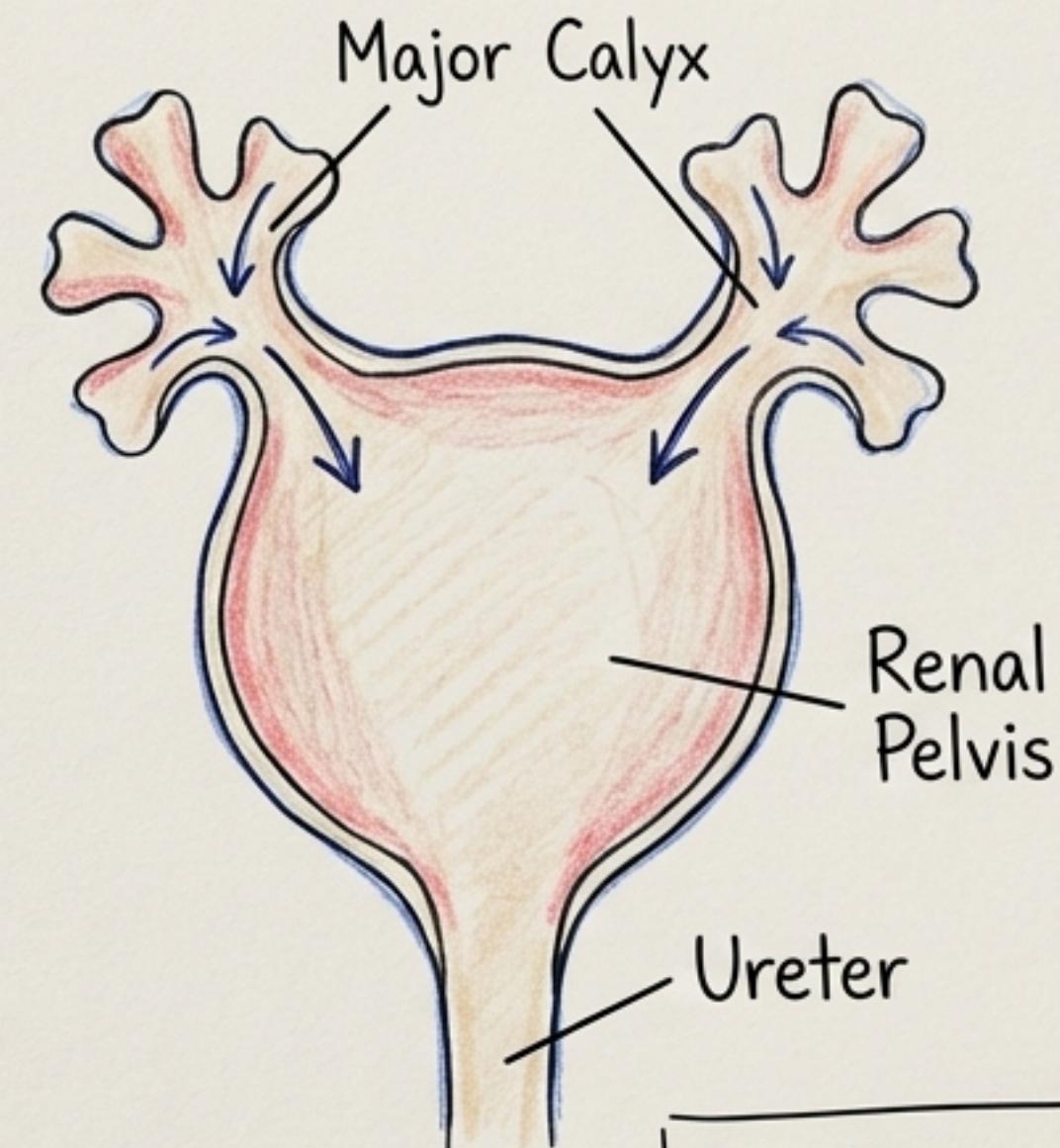
Step 5: Joining the Streams - The Major Calyx

- Formed by the joining of two or more minor calyces.
- Its function is to channel the collected urine.
- It directs urine towards the renal pelvis.



Step 6: The Main Funnel - Renal Pelvis

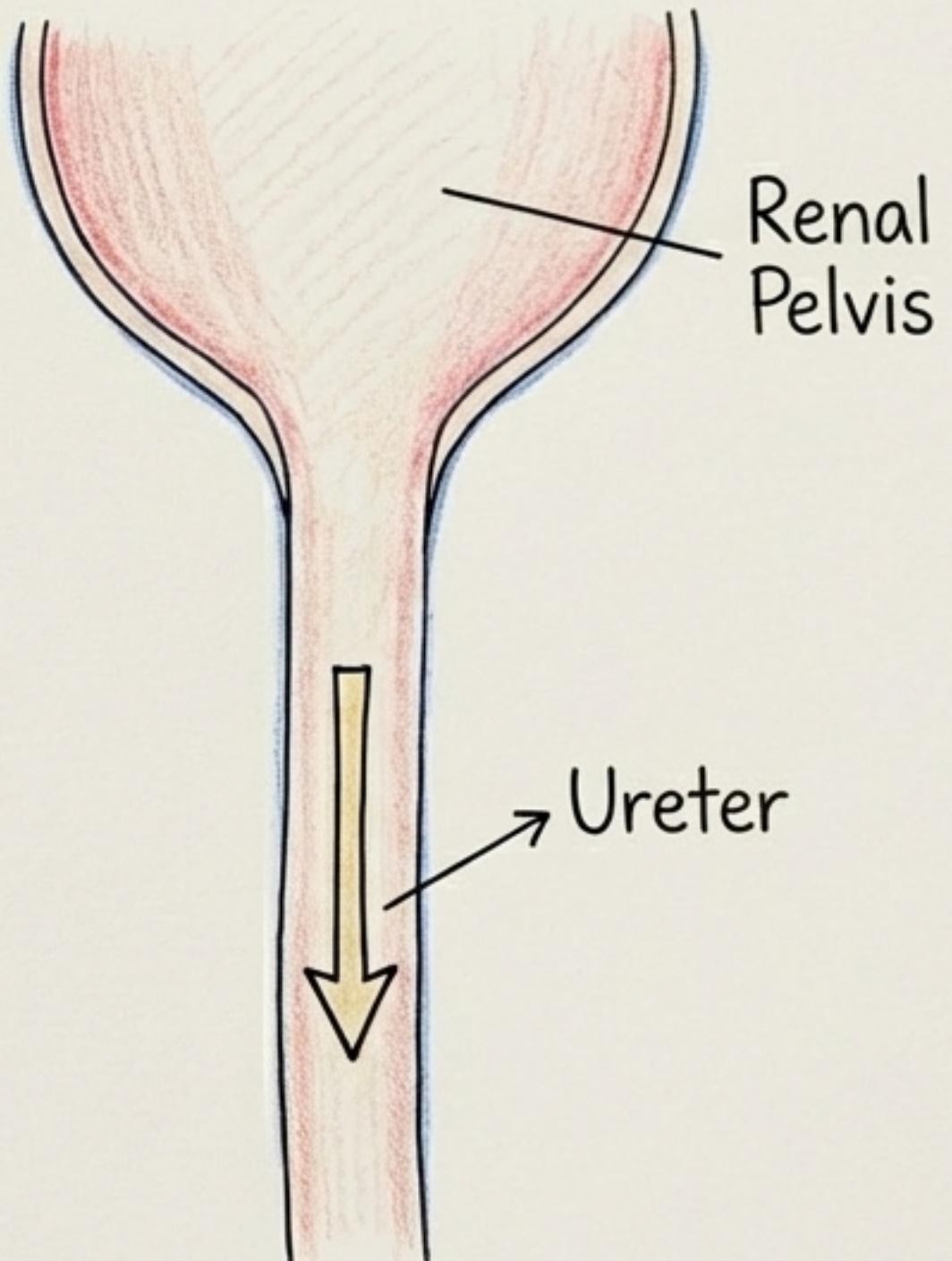
- A large, **funnel-shaped** area.
- It is an expansion of the upper part of the ureter.
- It collects all the urine from the major calyces.
- From here, it passes the urine into the ureter.



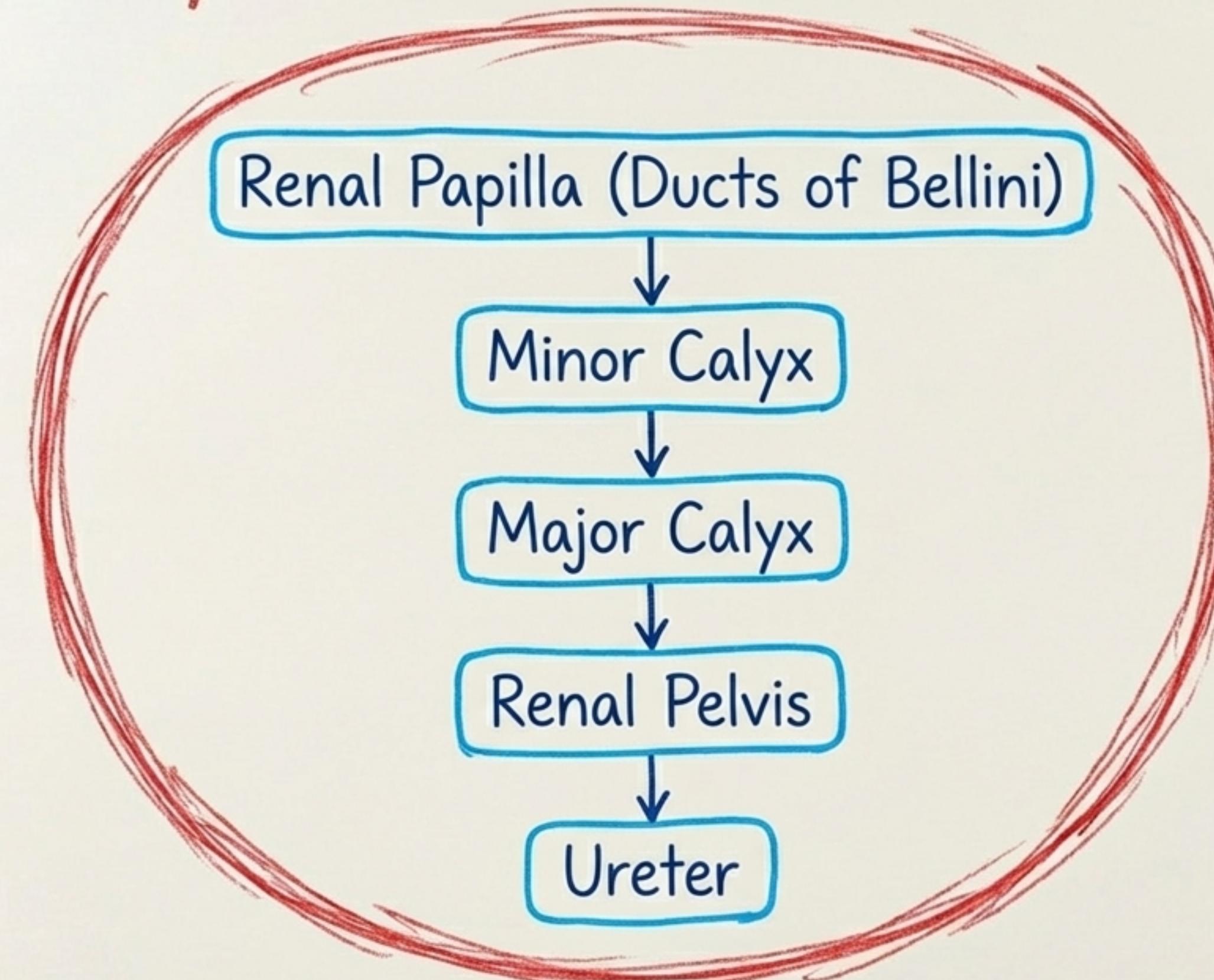
Don't confuse
Calyx and Pelvis!
Pelvis is the big,
final funnel.

Final Step: Exiting via the Ureter

- The Ureter is the tube that carries urine away from the kidney.
- The Renal Pelvis narrows to become the ureter.
- It transports urine down to the urinary bladder (not shown).



Summary: The Path of Urine Flow



Memorize
this flow!
Very important
for exams!

Quick Revision - Full Diagram

- Use this for last-minute revision before the exam.
- Practice drawing this 2-3 times! All labels are important.

