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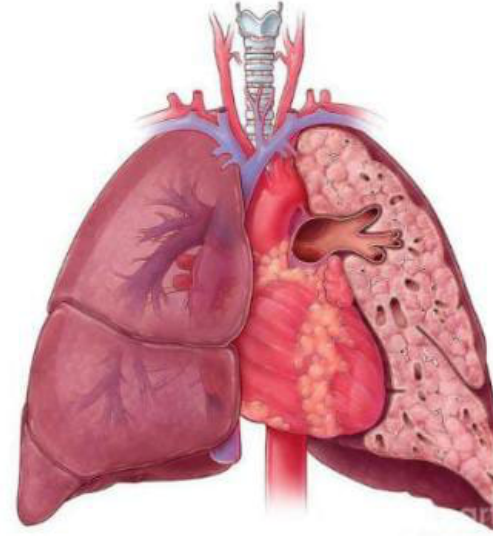


لجان الدفوعات

اللهم صبراً، اللهم جبراً، اللهم قوة .



دعواتكم



تفريغ أناتومي



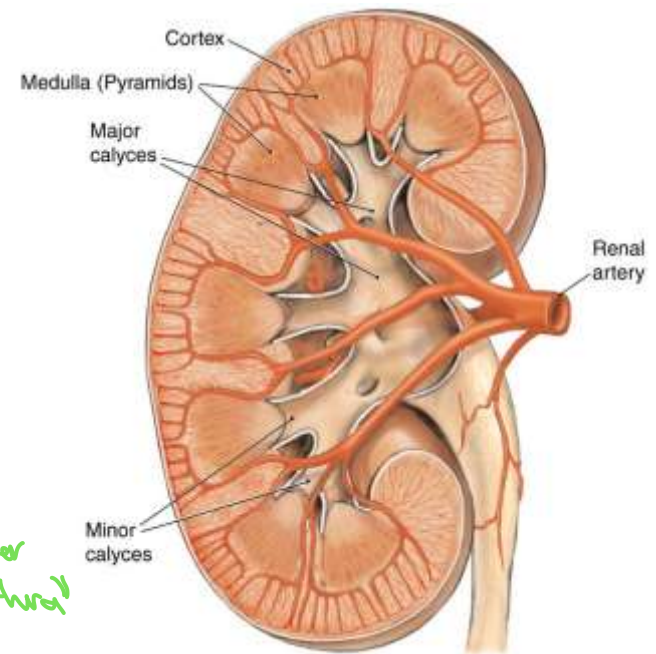
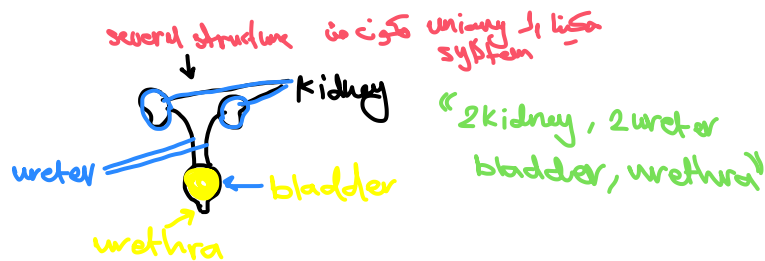
Urinary system : موضوع المحاضرة

رقم المحاضرة : محاضرة الاولى من الفاينل

Ayaayyash : إعداد الصيدلانية

The Urinary System

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(2021)



Overview

The urinary system is formed of several organs with different functions:

Organ	Functions
Kidneys (2)	1. Regulate blood volume and contents, pH, and blood pressure. عن طريق AdH HCO₃⁻ الذي يتحول إلى renin الذي يتحول إلى aldosterone 2. Produce hormones. → erythropoietin → red blood cell → aldosterone → renin → cholesterol → vitamin D 3. Excrete waste products in urine. إخراج البول
Ureters (2)	Transport urine from kidneys to urinary bladder. "passage" معبر فقط النقل
Bladder (1)	Stores urine and expels it into the urethra when necessary. وتخزينها إلى "storage"
Urethra (1)	Excretes urine to the outside of the body. ملاحظة: يختلف بين male عن female ↑ UTI أكثر من female ↑ أكثر

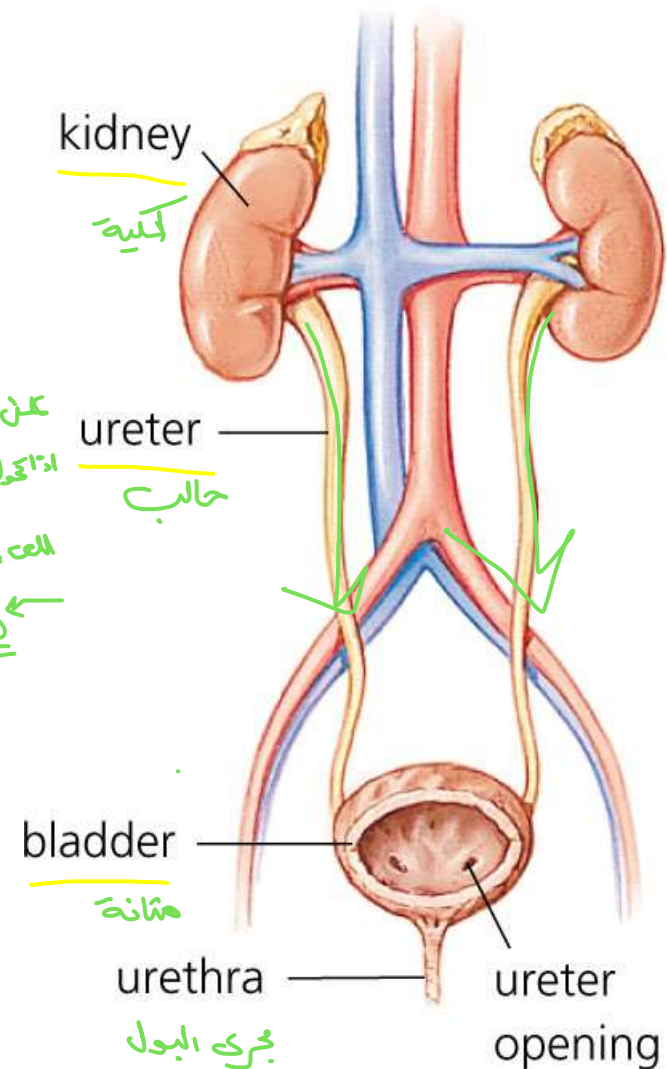


Fig.1: Organs of the urinary system.

The Kidneys

- ❑ Bean-shaped organs. تشبه حبة الفاصوليا
- ❑ Located on the posterior abdominal wall on each side of the vertebral column.
- ❑ Right kidney is lower (pushed down by the liver). الكلى اليمنى تكون أدنى من الكلى اليسرى لأنها تدفع لأسفل بواسطة الكبد
- ❑ Each kidney has upper and lower poles, anterior and posterior surfaces, and medial and lateral borders. كل كلية لها قطبين (أعلى وأسفل)، سطحيين (أمامي وخلفي)، وحدتي حواف (داخلية وخارجية).
- ❑ The concave medial border is the hilum. Through it pass: the ureter, renal artery and vein, lymphatics, and nerves. المكان الذي يدخل فيه.

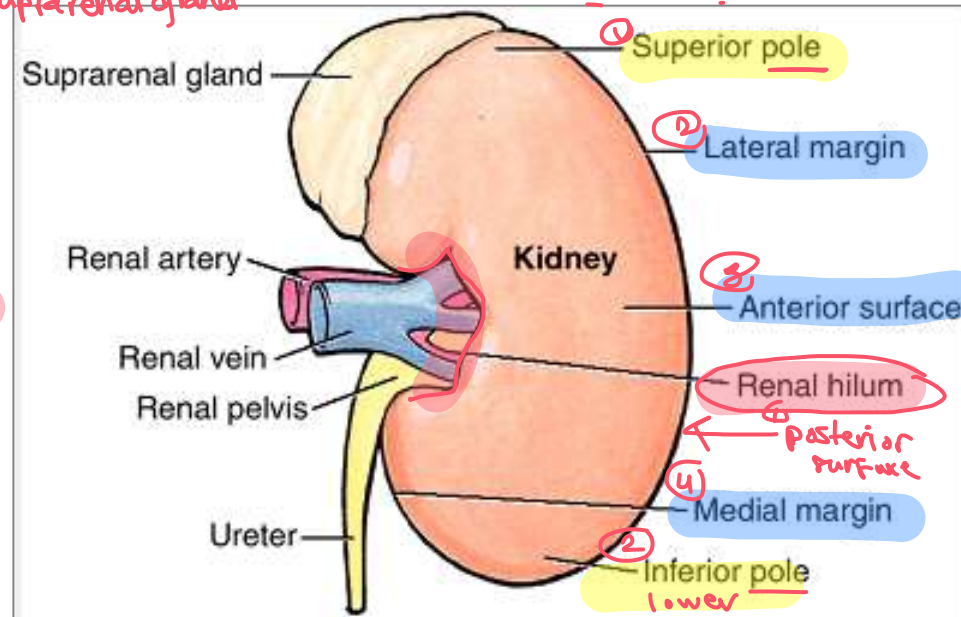


Fig.2: The kidney.

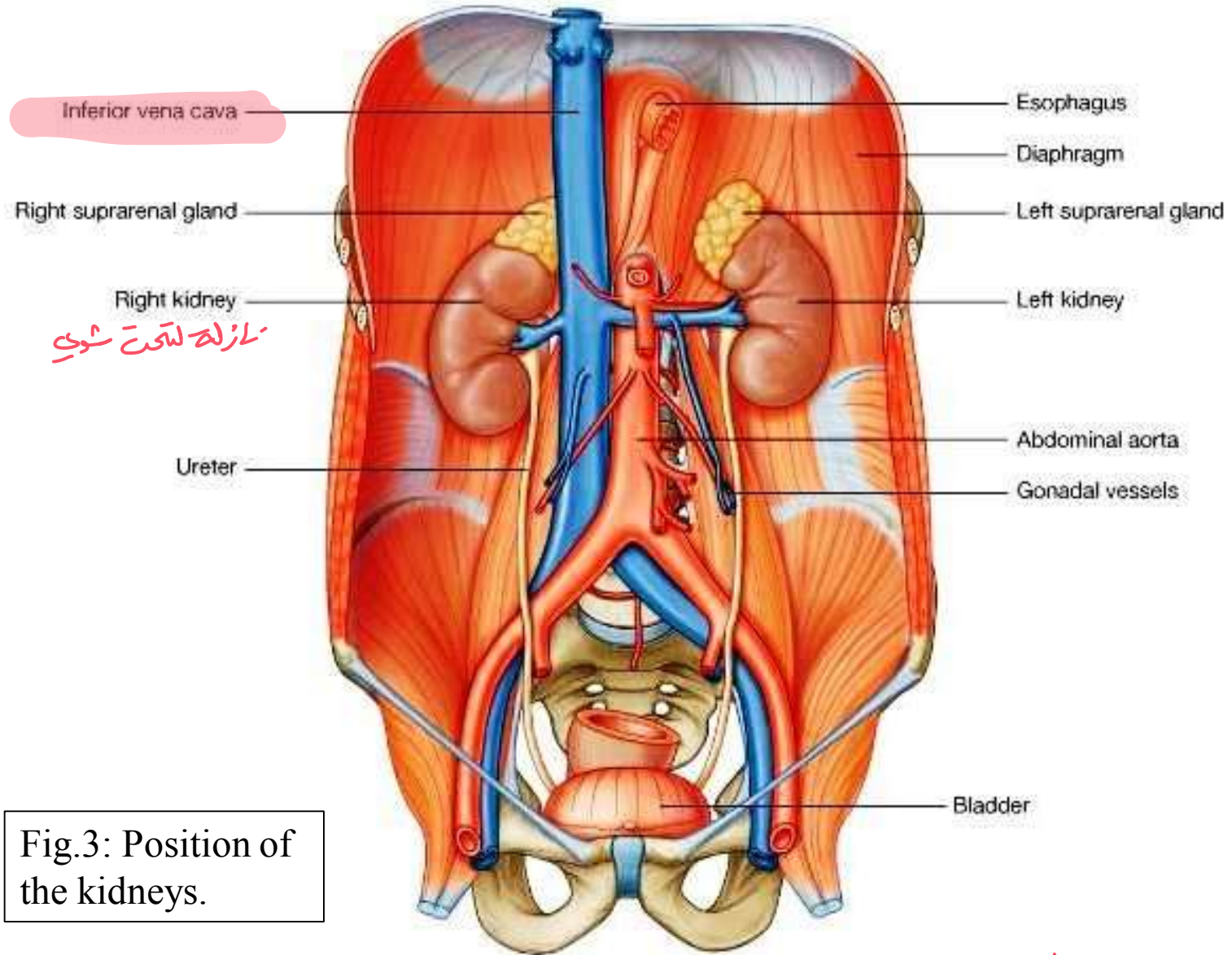
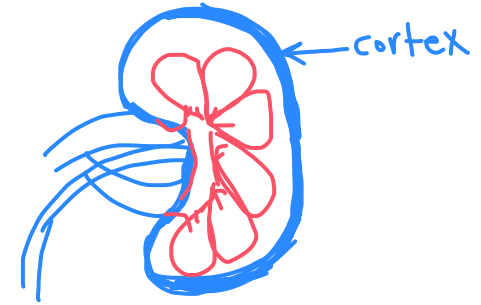


Fig.3: Position of the kidneys.

هذه الصورة
أو
Coronal

Internal Anatomy of the Kidneys



■ Renal cortex – superficial

- Outer cortical zone.
- Renal columns – portions of cortex that extend between renal pyramids. پروژانت

■ Renal medulla – inner region درست

- Several cone shaped renal pyramids – base faces cortex and apex (renal papilla) points toward hilum.

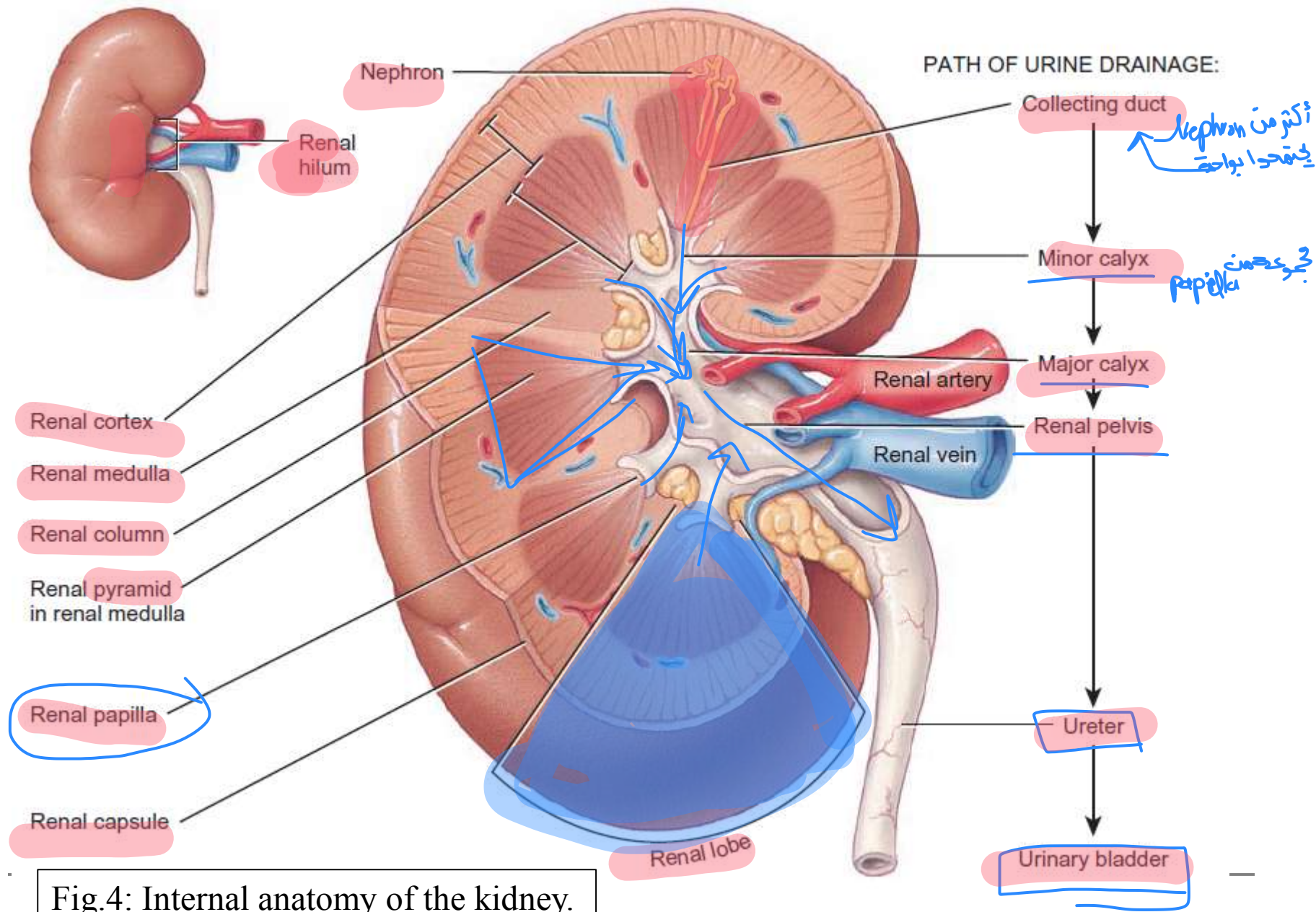
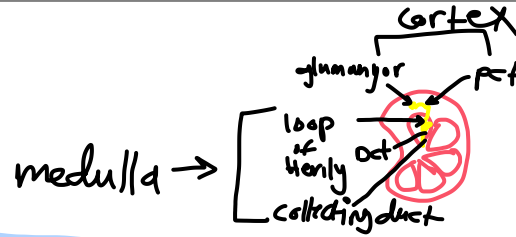


Fig.4: Internal anatomy of the kidney.

The Nephron



- ❑ Nephrons are the functional units of the kidneys.
- ❑ There are millions of nephrons in each kidney.
- ❑ They are formed of 2 parts:
 - **Renal corpuscle** – filters blood plasma. filtration
 - ❑ Glomerulus – capillary network.
 - ❑ Glomerular (Bowman's) capsule – double-walled cup surrounding the glomerulus.
 - **Renal tubules** – where reabsorption takes place.
 - ❑ Proximal convoluted tubule (PCT).
 - ❑ Descending and ascending limbs of the loop of Henle (nephron loop).
 - ❑ Distal convoluted tubule (DCT).

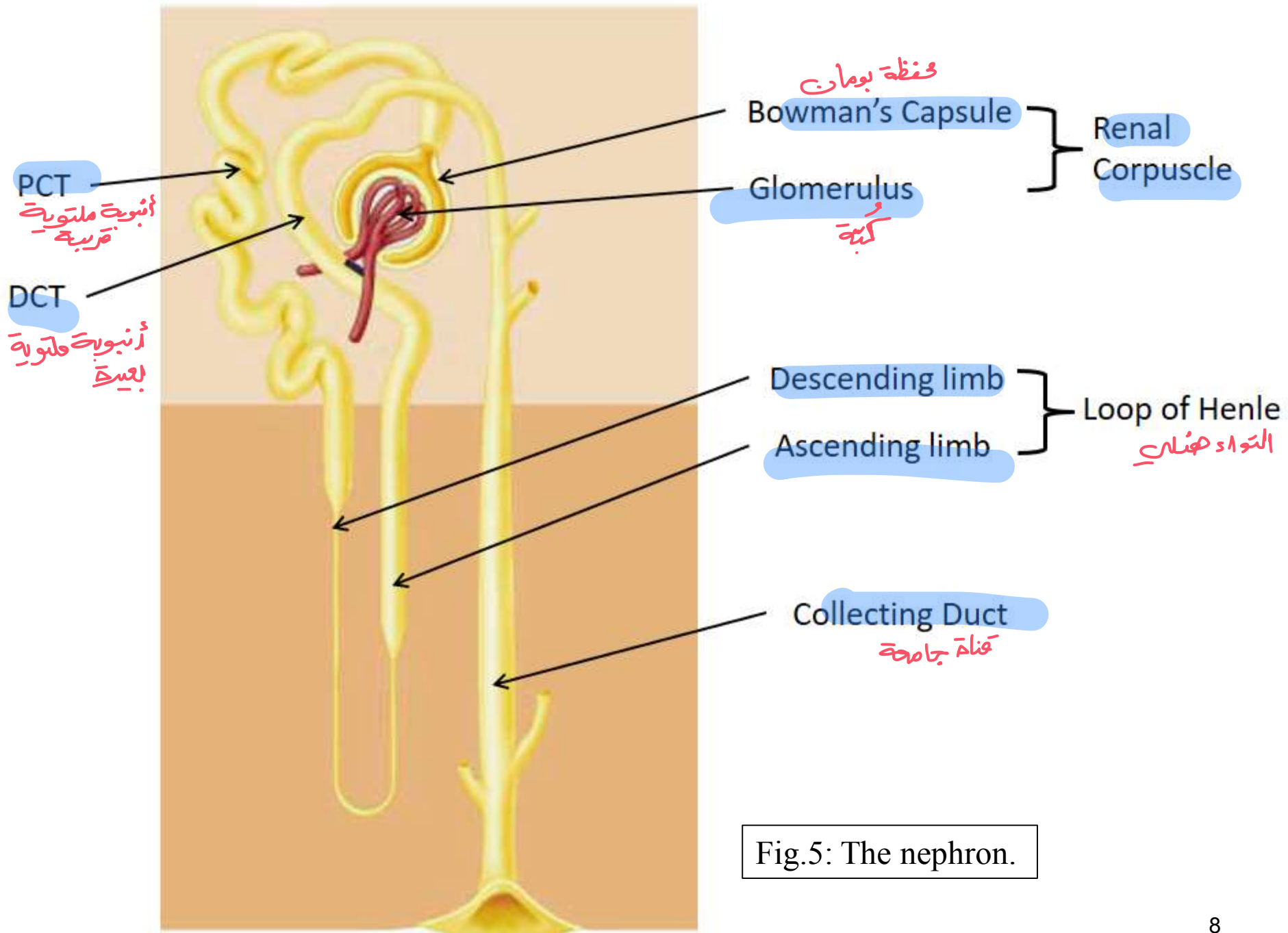


Fig.5: The nephron.

- Collecting ducts open into minor calyces. Several of these open into a major calyx. 2-3 major calyces open into the renal pelvis (the upper dilated part of the ureter).

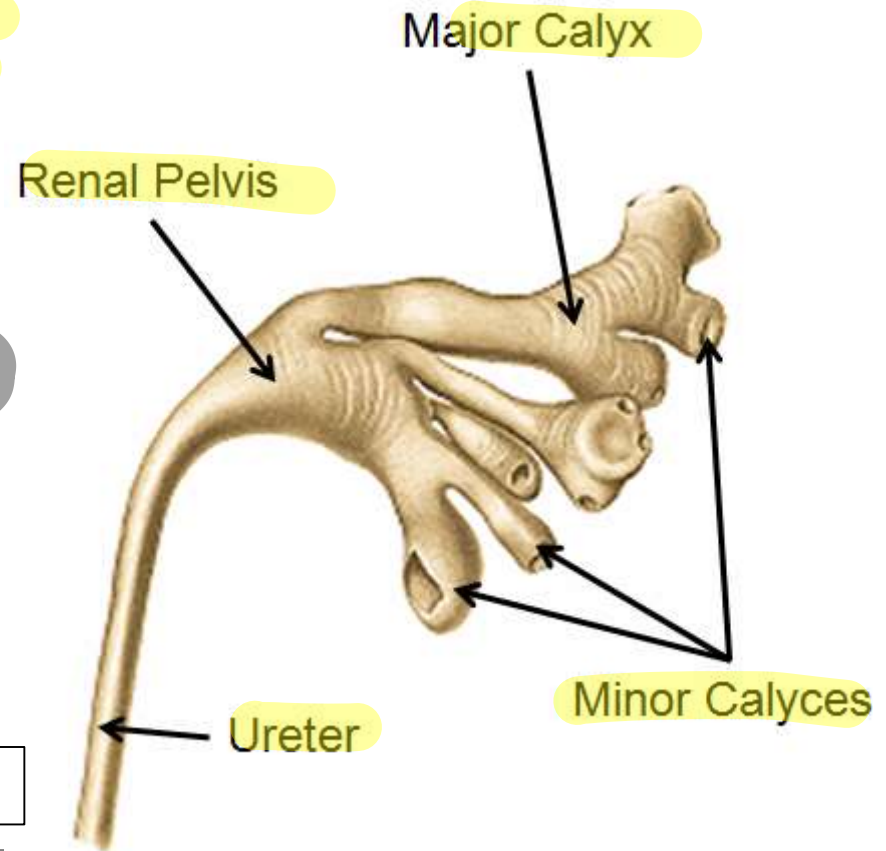


Fig.6: Minor and major calyces.

Blood supply of the kidney

عليه سؤلين أكيد

أهم مسائل 12 شرح مسائل 12

- Because the kidneys function in the regulation of blood contents, they receive an abundant blood supply despite their small size.
- Blood is supplied to each kidney by the **renal artery**.
- Renal artery forms **segmental arteries**.  أجزاء
- Segmental arteries give rise to **interlobar arteries** (pass between lobes).
- Interlobar arteries arches near the base of the renal pyramids to form the **arcuate arteries**.  قوس
- From the arcuate arteries arise the **interlobular arteries**.  ينتهي
- From the interlobular arteries arise a single **afferent arteriole** for each nephron.  أدخل
- Afferent arteriole forms a **ball of capillaries** called **glomerulus**.  أطعم
- Capillaries then unite to form a single **efferent arteriole**.  أخرج

أنا حفظها أنه حزن أ قبل ع

- The **efferent arteriole** will form (**peritubular capillaries**) around the **renal tubules**.
- Blood is **drained into veins** corresponding to the arteries. The blood is finally collected into a single **renal vein** that **exits** the kidney through **the hilum**. The right and left renal veins drain into the **inferior vena cava**.

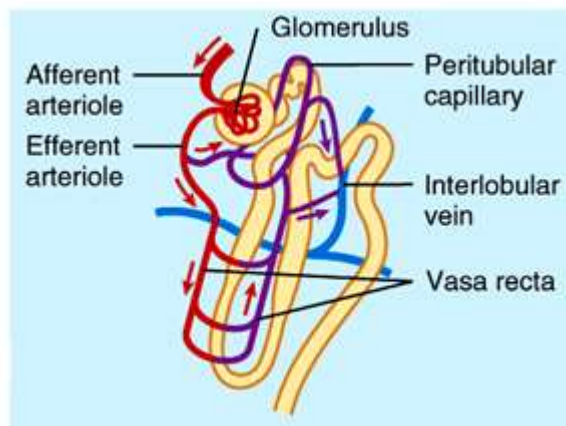
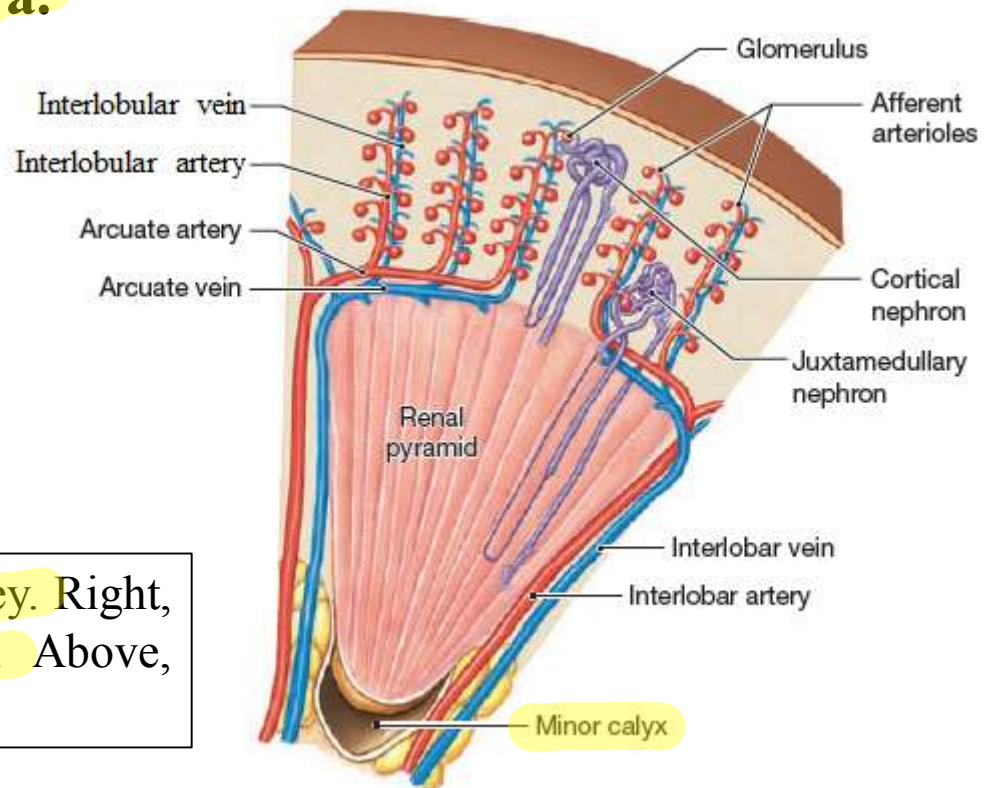
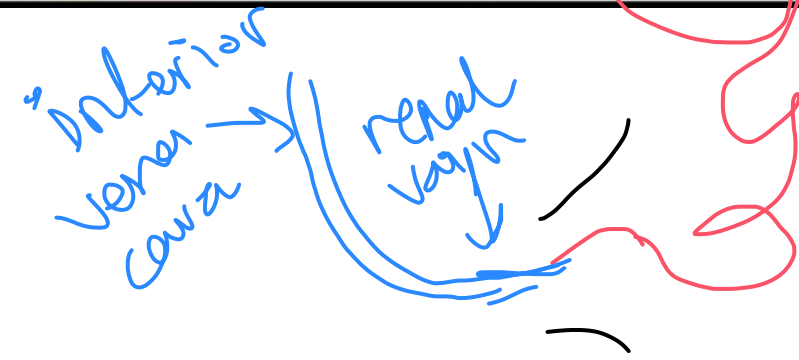
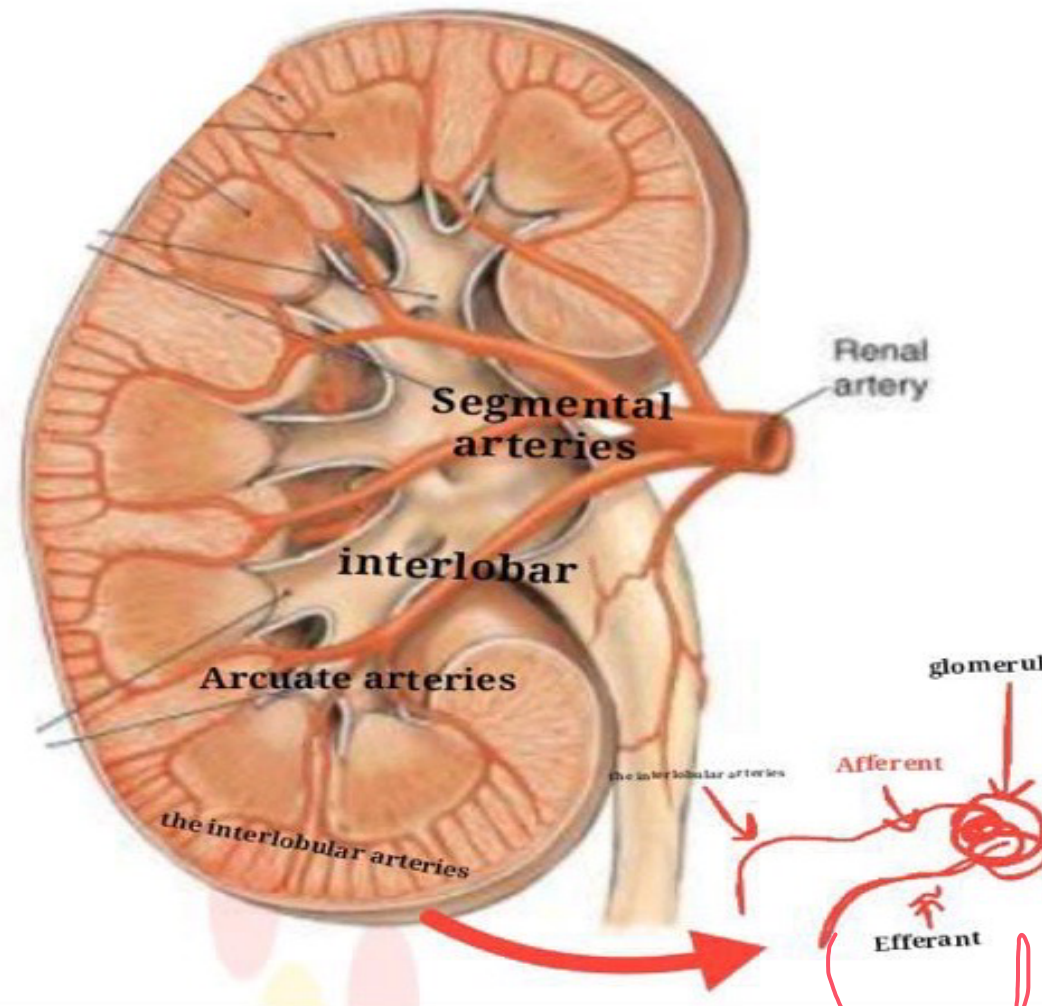


Fig.7: Blood supply of the kidney. Right, blood supply of a renal lobe. Above, blood supply of a nephron.



اول شي فيه عنا ال **ayorta** بس ينزل على ال
abdomen رح يصير اسمه **abdomen**
ayorta من تفرعاته اشي اسمه **renal**
artery رح يدخل من ال **renal hilum** اول
division رح يعملها اسمها **segmental**
arteries يعني اجزاء يعني كل **renal**
artery رح يعطينا من ٧ ل ٨ اجزاء مش اكثر
 من هيك رح يتجزأ ال **segmental arteries**
 رح يعطيني **interlobar arteries** حكيما ال
loop بكون **pyramid** رح يكون ال **artery**
 على القاعده المثلث فارح يكون اسمه **arcuate**
arteries يعني شكل الشريان قوس كل وحده
 رح يطلع منهم **interlobular artery** هو
 مسؤولا لي بتفرع منها ال **afferent**
arteriole وهاي بتكون شعيرات كثيرة على
 شكل كرة بصير اسمها **glomerular** الي
 بتكون بالكابسول وبتطلع على شكل **efferent**
arteriol



رح يطلع من **glomerulus** ارتري مش فين اسمه **efferent** ورح
 يتفرع ويلتف حول القنوات **tubular** اسمه **peritubular capillaries**
 رح يطلع من ال **pelvic** ورح يطلع على شكل **renal vein** ورح يروح
 على **inferior vena cava**

يعني ال pathway بالاكتر هيك

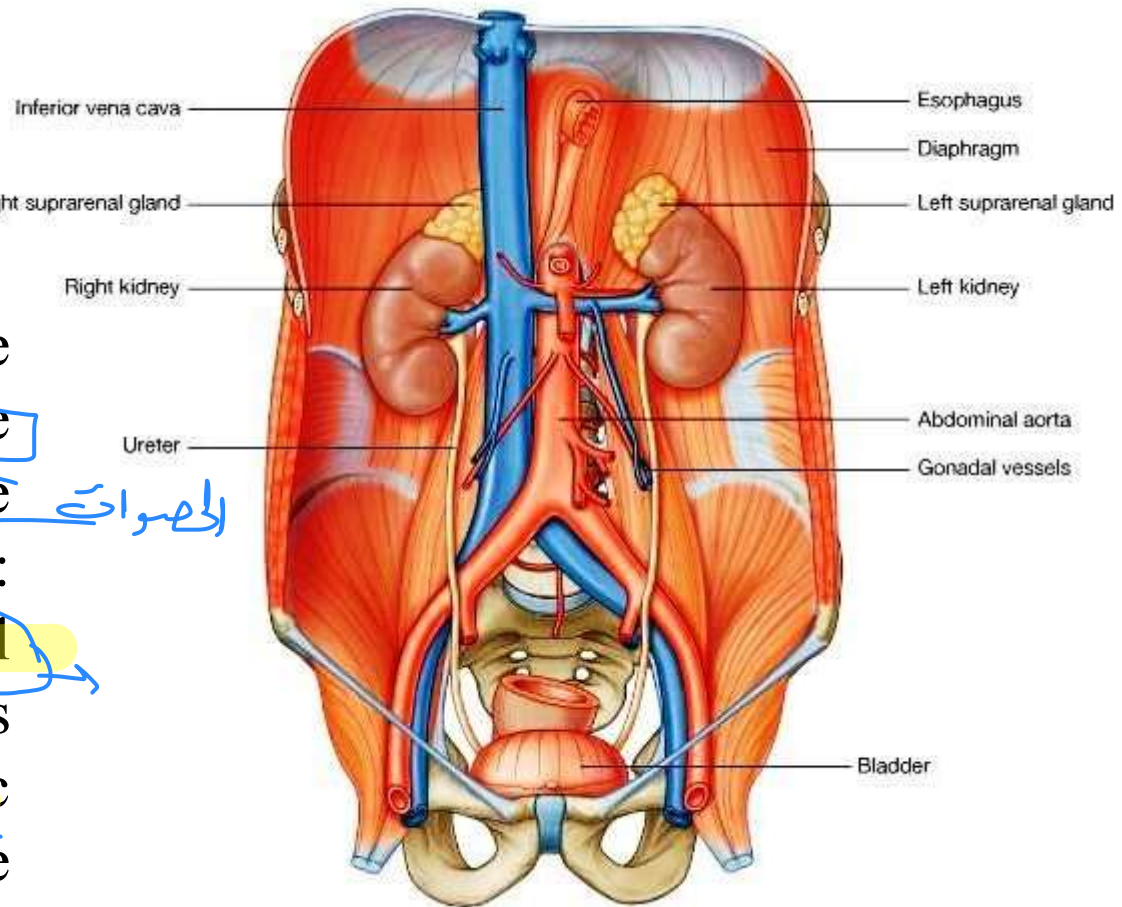
abdomen ayorta
 ↓
 renal artery → segmental artery → interlobar → arcua

The Ureters

الكلبين

- Two long muscular tubes that transport urine from the kidneys to the bladder.
- The upper part of the ureter is dilated and forms the renal pelvis.
- Course:
 - ❑ Pass inferiorly in front of the psoas major muscle.
 - ❑ Cross the bifurcation^{الشعب} of the common iliac artery.
 - ❑ Pass down in the pelvis.
 - ❑ Enter the posterior wall of the urinary bladder.

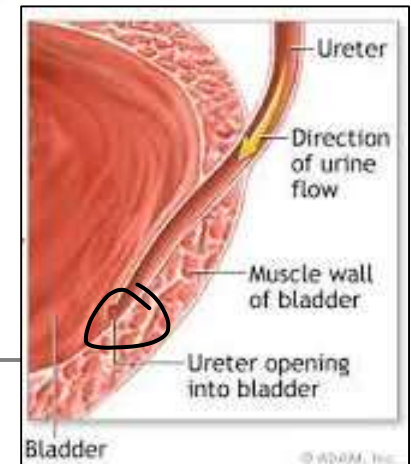
- The ureters are constricted at three regions. These are common sites of stones:
- (1) junction of renal pelvis and ureter,
 - (2) as ureter crosses pelvic brim,
 - and (3) within the wall of the bladder



الحالبات هي أنابيب عضلية طويلة تنقل البول من الكلية إلى المثانة، وتتضيق في ثلاث مناطق شائعة لتكون نقاط تكون الحصى فيها.

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Fig.8: Course of the ureters. The small image shows the passage of the ureter within the bladder wall.



The Urinary Bladder

المثانة

- The bladder is a storage site for urine. It's a pelvic organ. But, when it's filled with urine, it may reach into the abdominal cavity.
- An empty bladder is pyramidal in shape.
- It has a superior, a posterior and two inferolateral surfaces.
- The base is posterior, and its apex is directed anteriorly and related to the pubic symphysis.
- The base is shaped like an inverted triangle. The two ureters enter the bladder through the superior corners of the base. The urethra exits the bladder through the inferior corner of the base.

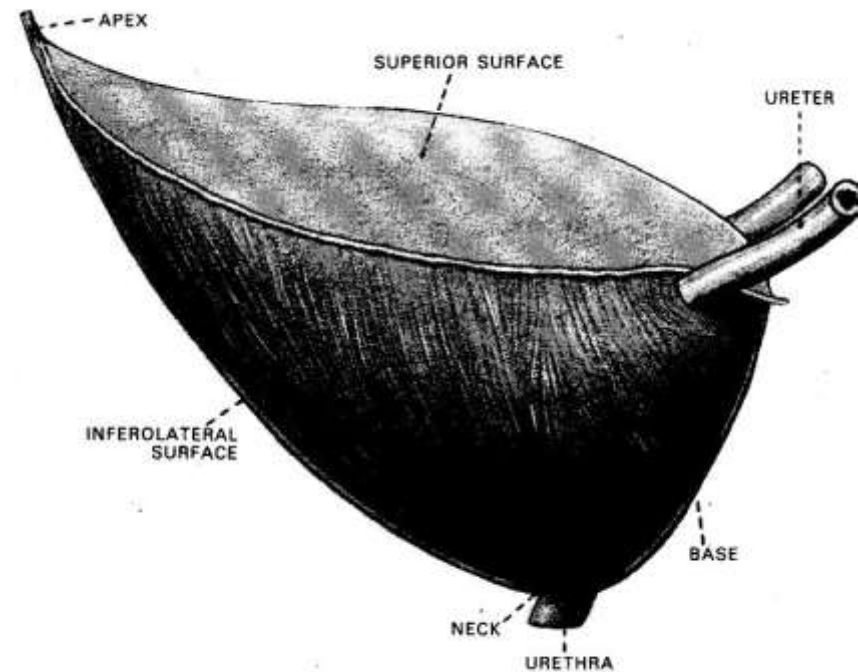


Fig.9: The urinary bladder.