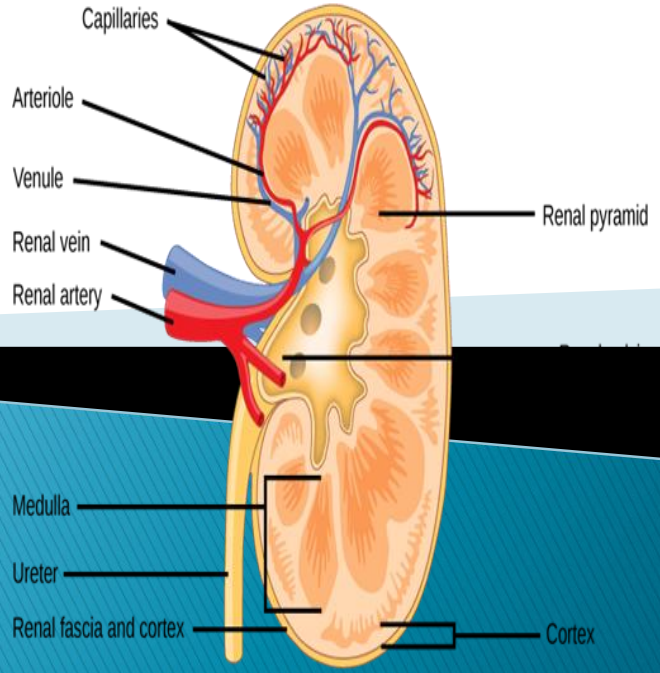
Al- Mustaqbal College University
kidney dialysis
Anatomy
2nd stage

BY:-
Dr.Roaa Nashat AL-Saffar

Relations of renal system



Introduction

The kidneys are paired, bean-shaped organs responsible for filtration of blood, regulation of fluid and electrolyte balance, and excretion of waste products. They are located in the retroperitoneal space on the posterior abdominal wall.

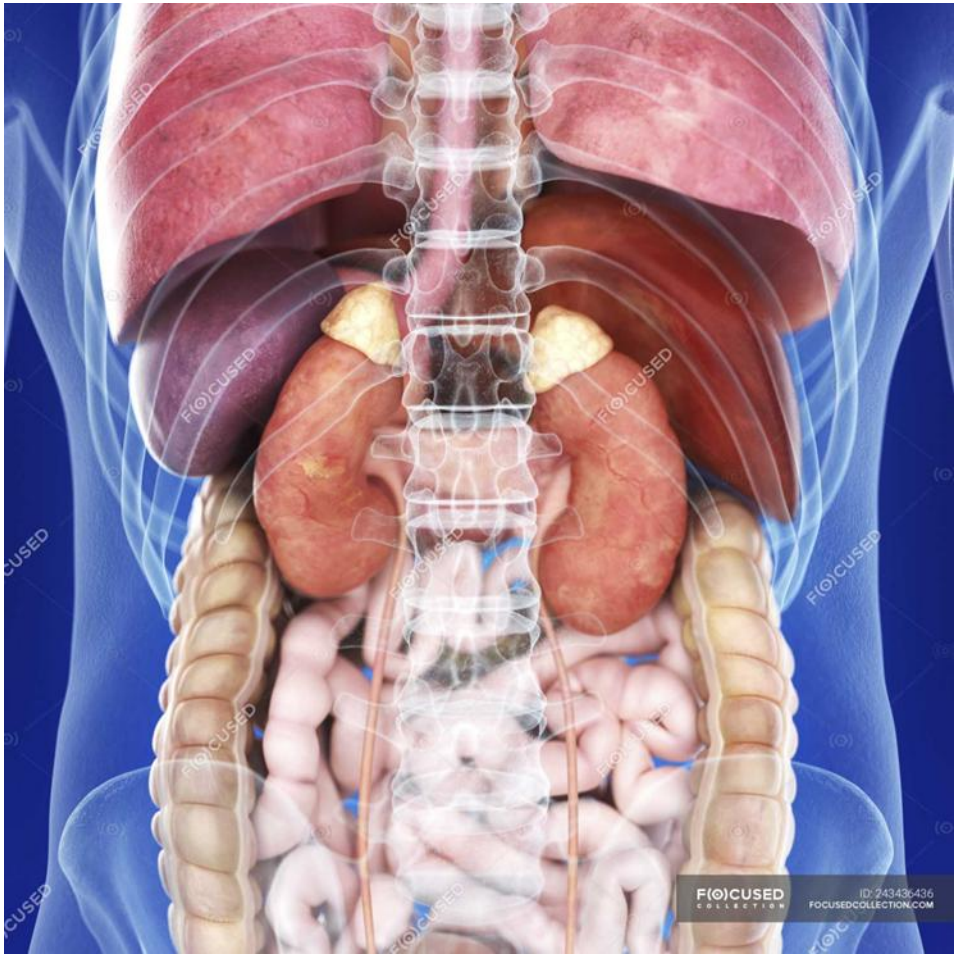
- Vertebral level: T12 to L3
- The left kidney lies higher than the right
- The right kidney is lower due to the presence of the liver
- Each kidney shows:
- Anterior relations
- Posterior relations
- Medial relations (hilum)
- Lateral relations

- **Right Kidney – Anatomical Relations**

- **1. Anterior Relations**

- The anterior surface of the right kidney is related to:
- • Right lobe of the liver (largest relation)
- • Second part of the duodenum
- • Right colic (hepatic) flexure
- • Loops of small intestine

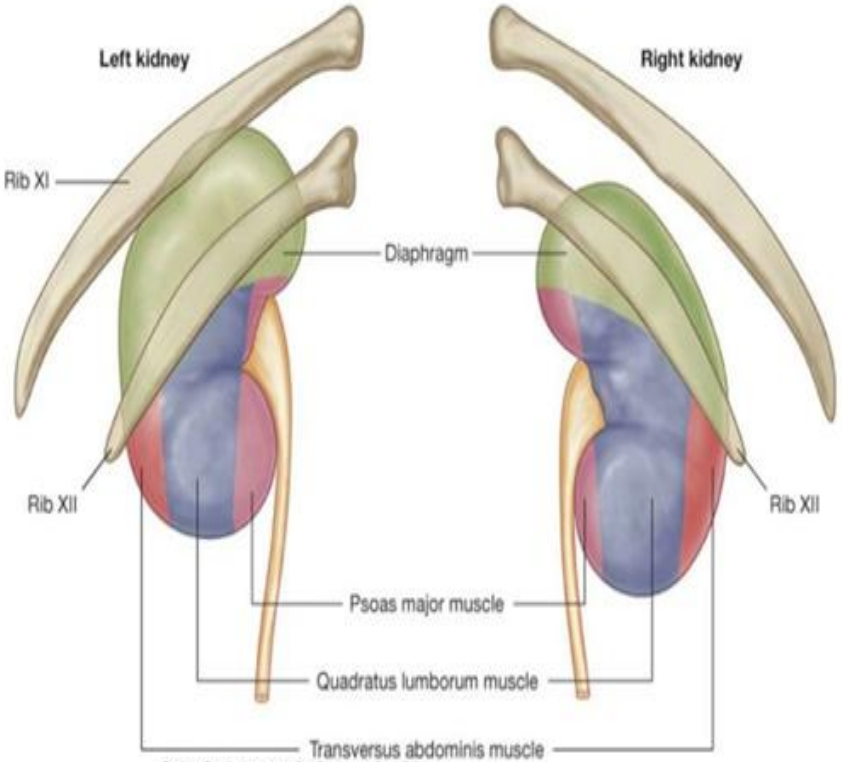
- The liver covers most of the anterior surface of the right kidney.


F(o)CUSED
COLLECTION
ID: 243436436
FOCUSEDCOLLECTION.COM

. Posterior Relations

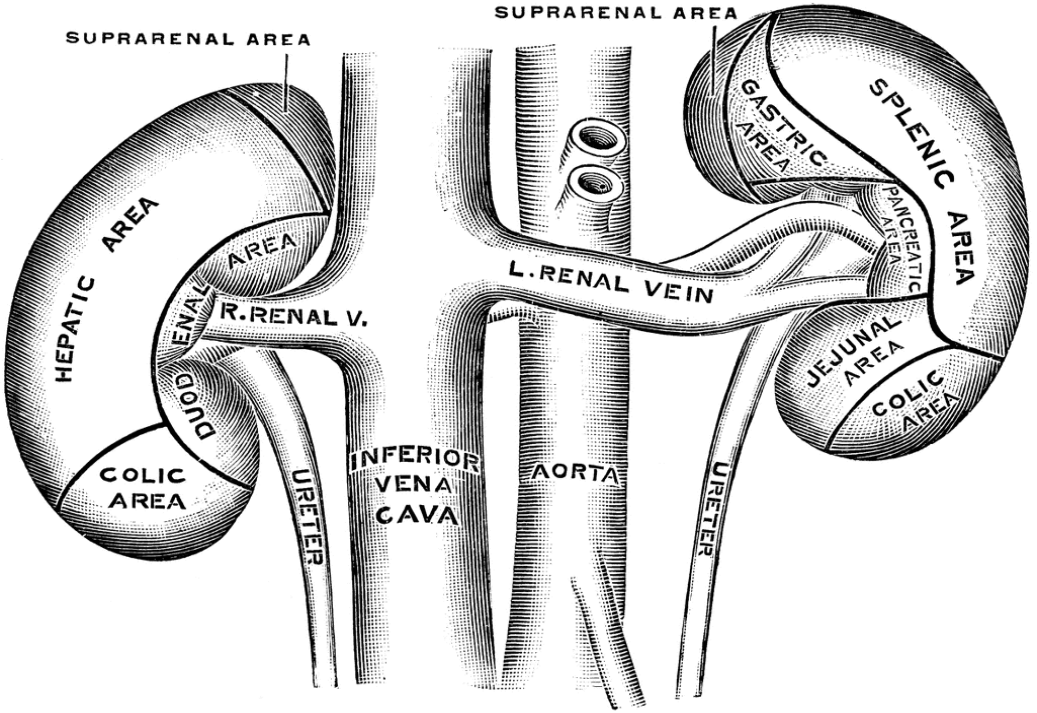
- Structures related posteriorly:
- • Diaphragm
- • 12th rib only
- • Muscles:
- • Psoas major
- • Quadratus lumborum
- • Transversus abdominis

Posterior relations of the kidney



MUSLIM MEDICS

- **3. Medial Relations**
- • Inferior vena cava (IVC)
- • Right renal artery passes posterior to the IVC
- • Right renal vein is short and drains directly into the IVC

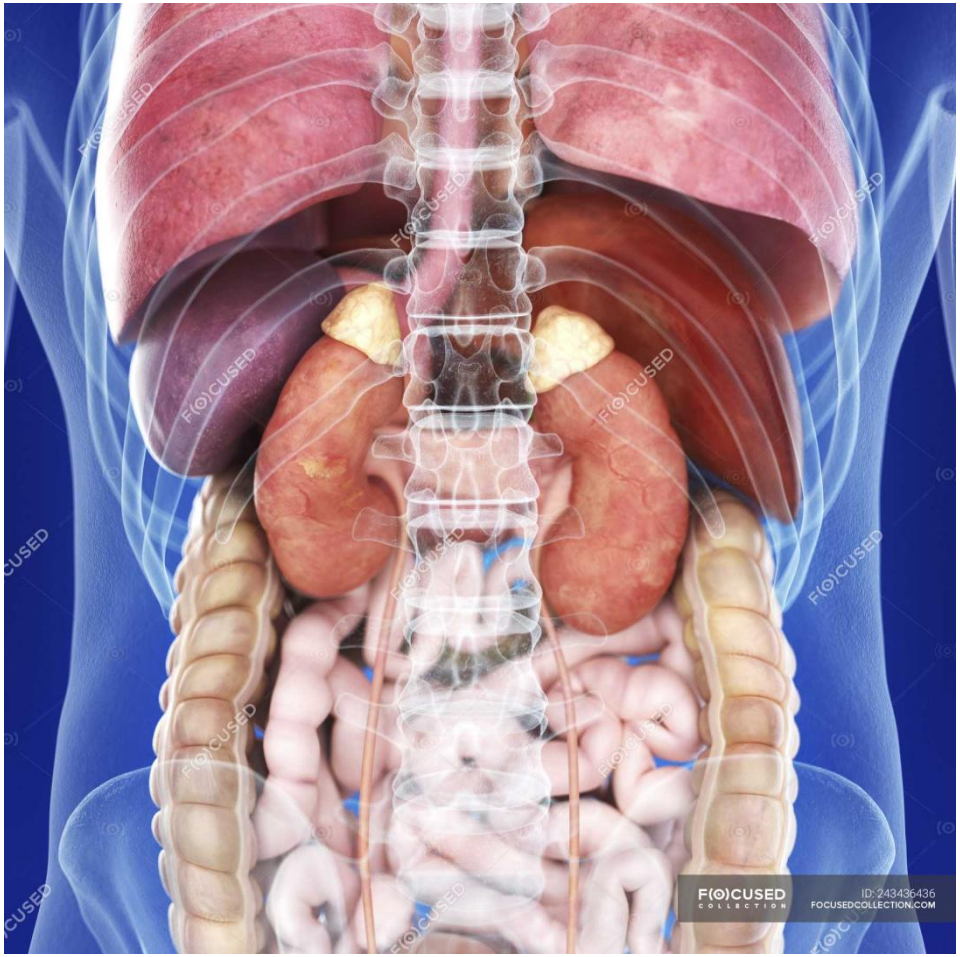


- **Left Kidney – Anatomical Relations**

- 1. Anterior Relations

- The anterior surface of the left kidney is related to:
- • Stomach
- • Spleen
- • Pancreas (body and tail)
- • Left colic (splenic) flexure
- • Jejunum

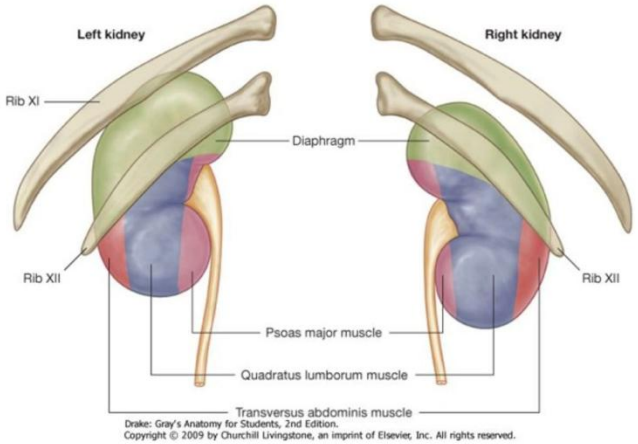
- The left kidney has more complex anterior relations than the right.


F(o)CUSED
COLLECTION
ID: 243436436
FOCUSEDCOLLECTION.COM

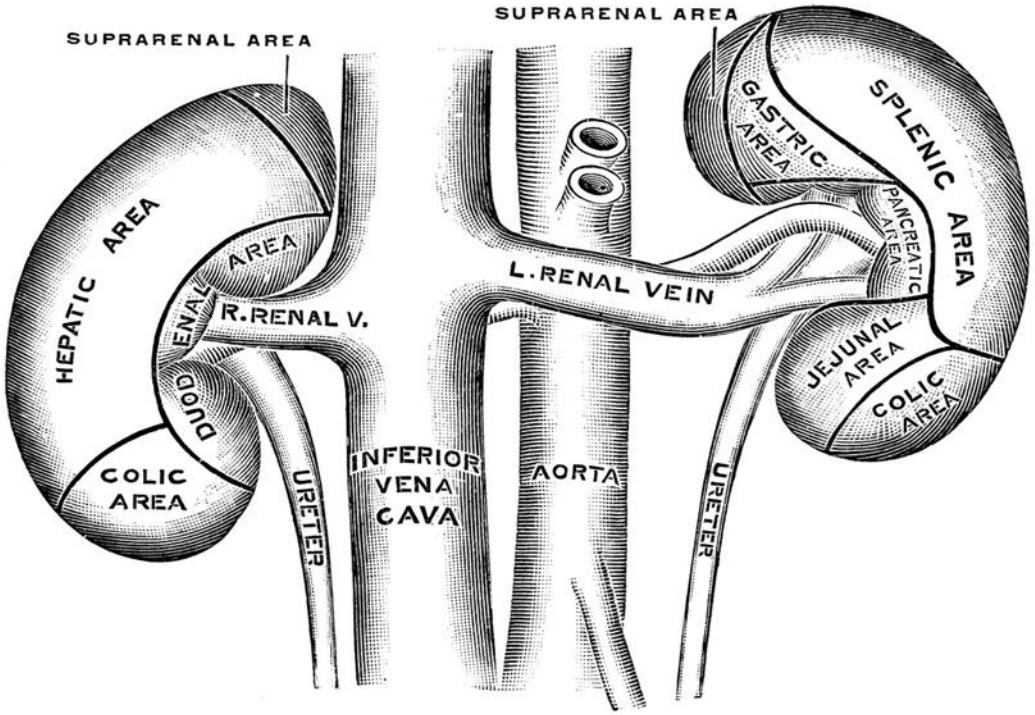
2. Posterior Relations

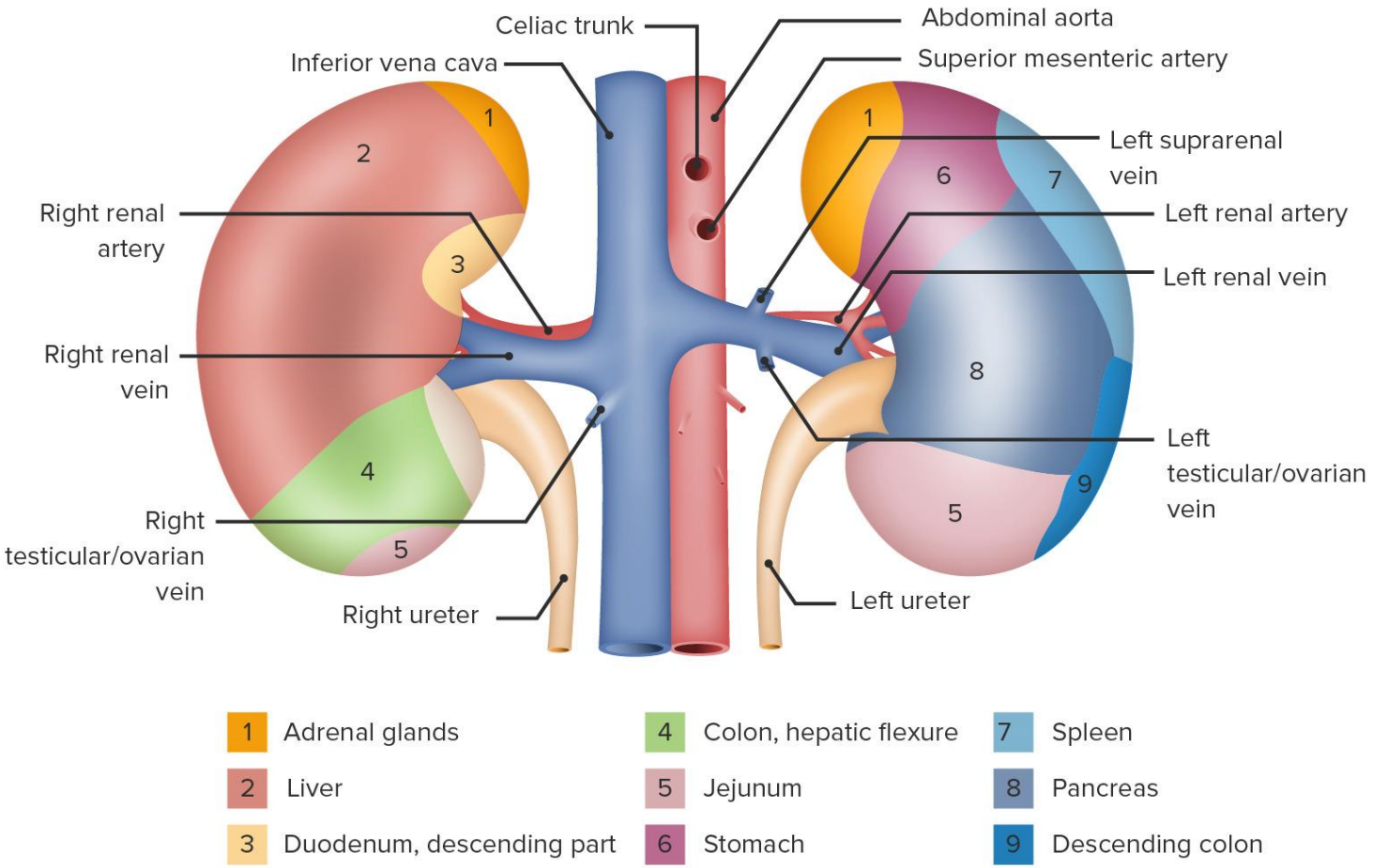
- Posterior relations include:
- • Diaphragm
- • 11th and 12th ribs
- • Muscles:
- • Psoas major
- • Quadratus lumborum
- • Transversus abdominis

Posterior relations of the kidney



- **3. Medial Relations**
- • Abdominal aorta
- • Left renal artery arises directly from the aorta
- • Left renal vein is longer, crosses anterior to the aorta, and drains into the IVC




Celiac trunk
Abdominal aorta
Inferior vena cava
Superior mesenteric artery
1
2
1
Left suprarenal vein
6
7
Right renal artery
Left renal artery
3
Left renal vein
Right renal vein
8
Left testicular/ovarian vein
4
9
Right testicular/ovarian vein
5
5
Right ureter
Left ureter
1 Adrenal glands
2 Liver
3 Duodenum, descending part
4 Colon, hepatic flexure
5 Jejunum
6 Stomach
7 Spleen
8 Pancreas
9 Descending colon

- **Clinical Importance**
- • Fracture of the 11th rib may injure the left kidney
- • Pancreatic tumors can compress the left renal vein
- • Surgical approaches to the kidney must consider colonic and duodenal relations
- • Renal pain may be referred to the back due to posterior nerve relations
- • Important in urology, surgery, anesthesia, and radiology

Right Ureter – Anatomical Relations

Anterior Relations

- Second part of the duodenum
- Right colic (hepatic) flexure
- Loops of small intestine
- Gonadal vessels (cross anteriorly)

Posterior Relations

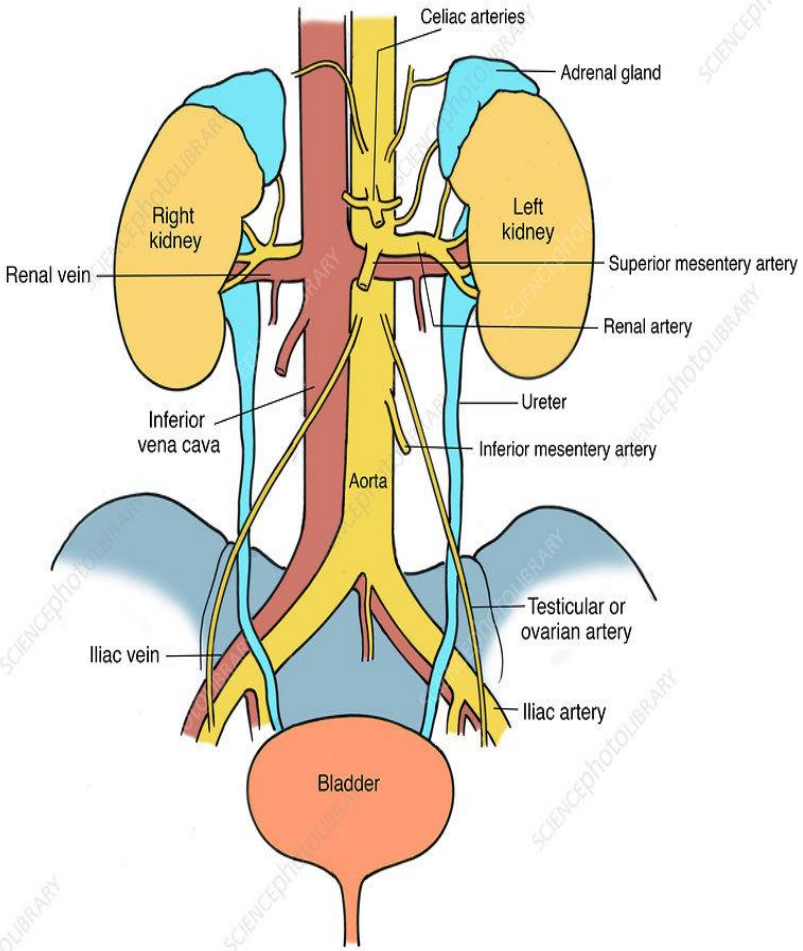
- Psoas major muscle

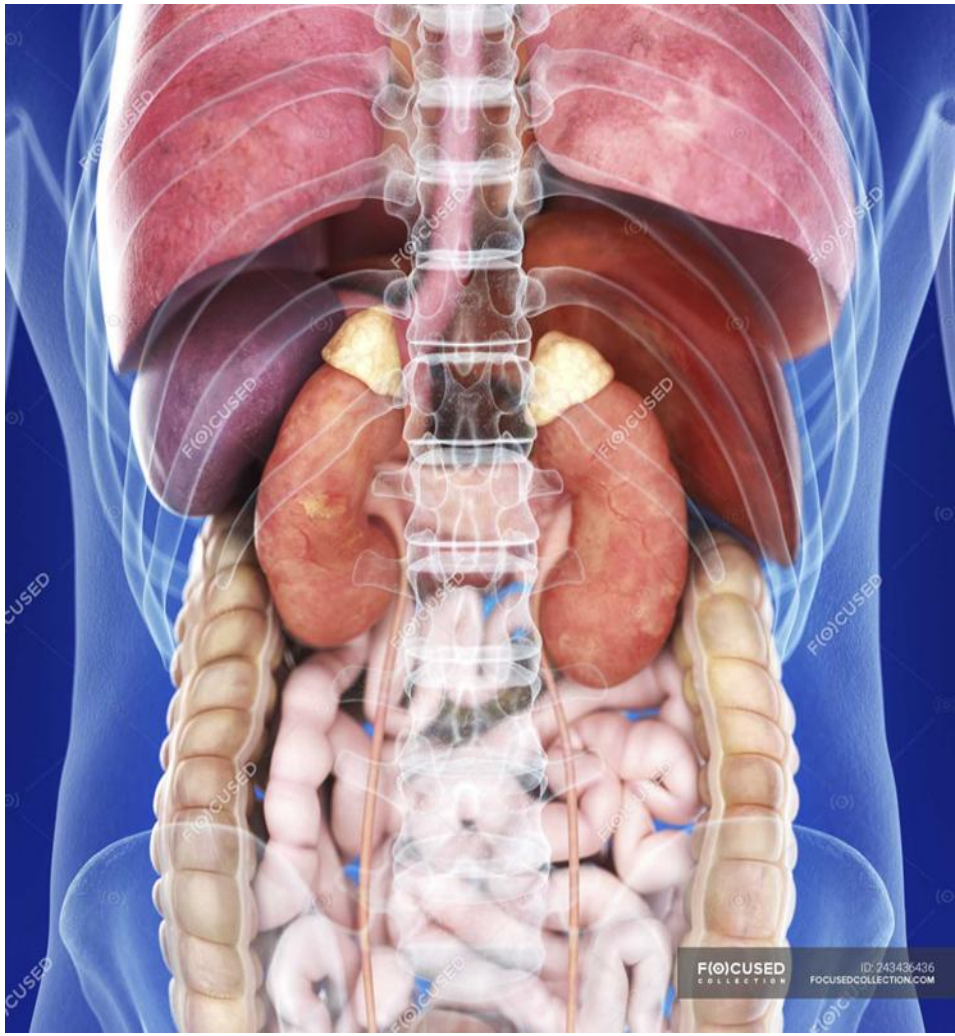
Medial Relations

- Inferior vena cava (IVC)

Lateral Relations

- Ascending colon


Celiac arteries
Adrenal gland
Right kidney
Left kidney
Renal vein
Superior mesentery artery
Renal artery
Ureter
Inferior vena cava
Inferior mesentery artery
Aorta
Testicular or ovarian artery
Iliac vein
Iliac artery
Bladder


F(O)CUSED
COLLECTION
ID: 243436436
FOCUSEDCOLLECTION.COM

Left Ureter – Anatomical Relations

Anterior Relations
- Sigmoid colon
- Descending colon
- Gonadal vessels (cross anteriorly)

Posterior Relations
- Psoas major muscle

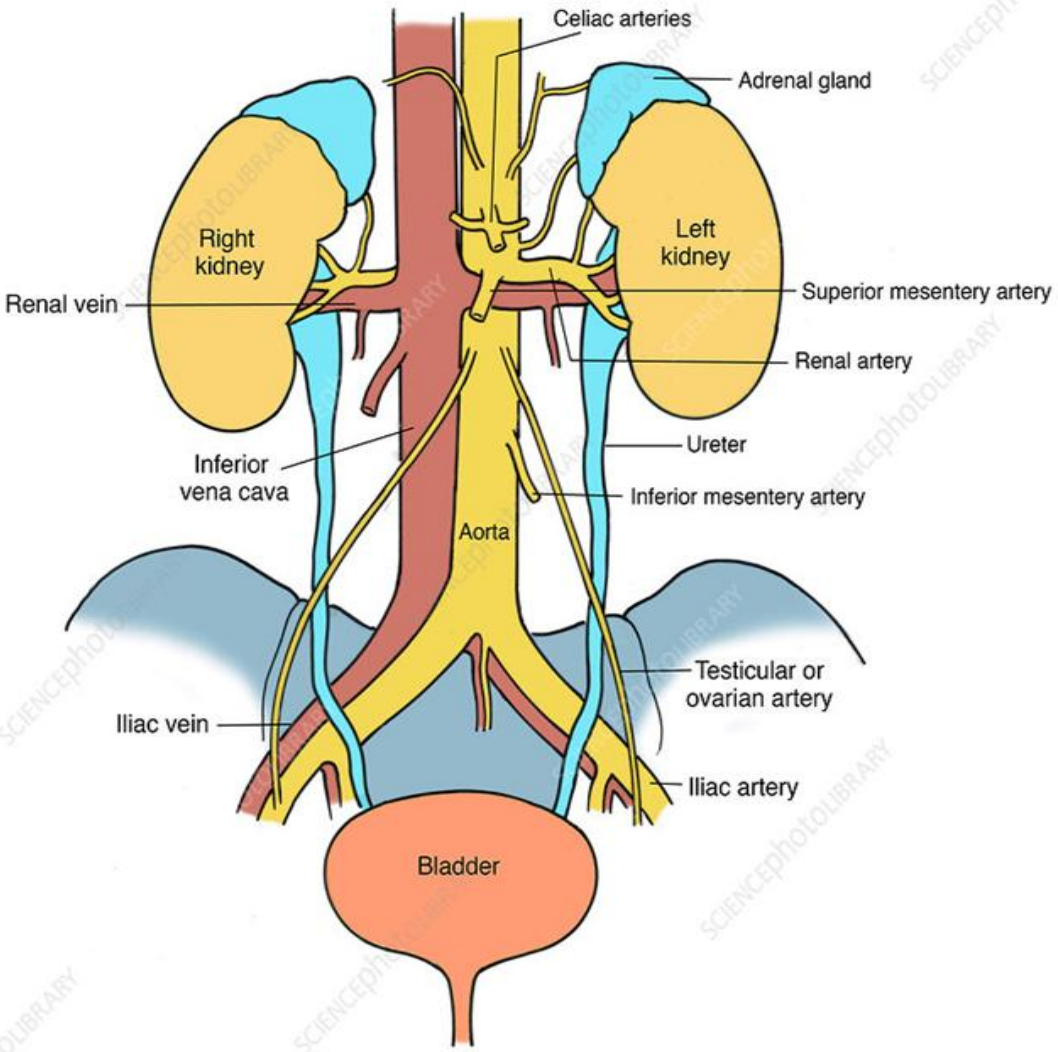
Medial Relations
- Abdominal aorta

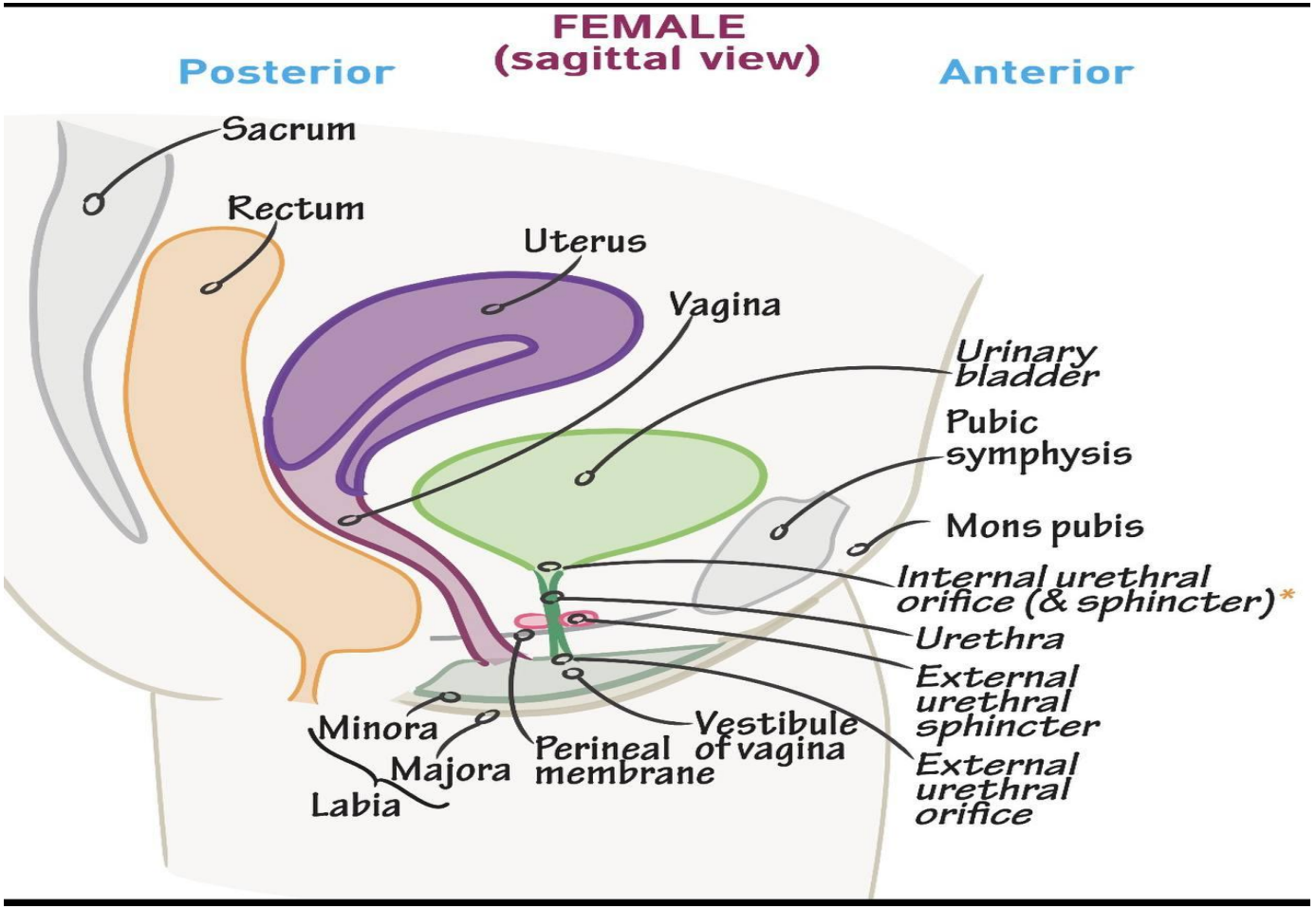
Lateral Relations
- Descending colon

- **Clinical Importance**
- • Ureter is at risk during:
- • Hysterectomy
- • Pelvic surgery
- • Colorectal surgery
- • Ureteric stones cause pain radiating from loin to groin
- • Compression differs due to right vs left relations
- • Important in urology, gynecology, general surgery, and anesthesia

Right and Left (Lateral) Anatomical Relations of the Bladder

- Right Side Relations
- • Levator ani muscle
- • Obturator internus muscle
- • Pelvic fascia
- • Right ureter (enters bladder posterolaterally)
- • Vas deferens (male)
- • Right uterine artery & cervix (female)


Celiac arteries
Adrenal gland
Right kidney
Left kidney
Renal vein
Superior mesentery artery
Renal artery
Ureter
Inferior vena cava
Inferior mesentery artery
Aorta
Testicular or ovarian artery
Iliac vein
Iliac artery
Bladder


FEMALE
(sagittal view)
Posterior
Anterior
Sacrum
Rectum
Uterus
Vagina
Urinary bladder
Pubic symphysis
Mons pubis
Internal urethral orifice (& sphincter)*
Urethra
External urethral sphincter
External urethral orifice
Vestibule of vagina
Perineal membrane
Minora
Majora
Labia

- Left Side Relations
- • Levator ani muscle
- • Obturator internus muscle
- • Pelvic fascia
- • Left ureter (enters bladder posterolaterally)
- • Vas deferens (male)
- • Left uterine artery & cervix (female)

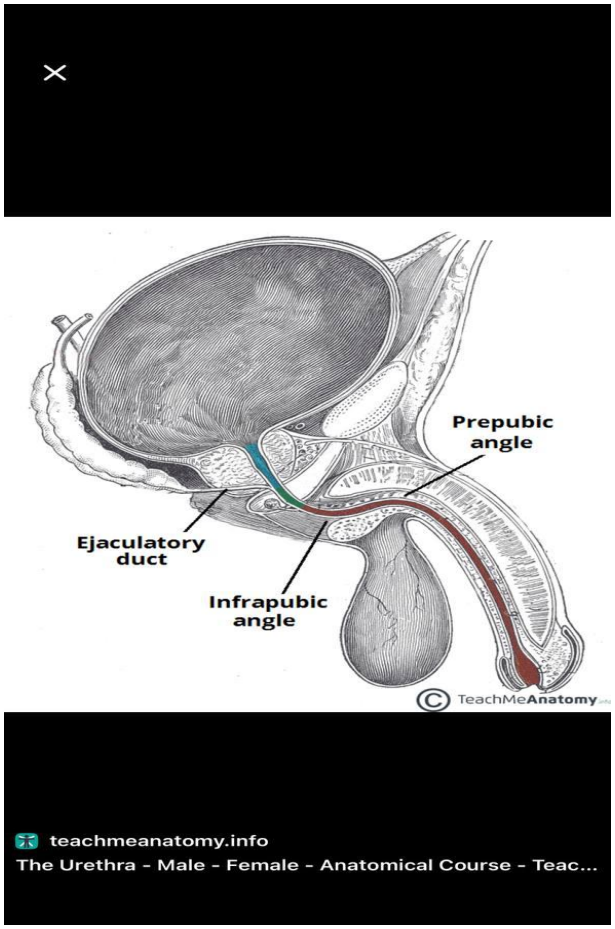
Sex Differences in Bladder Relations

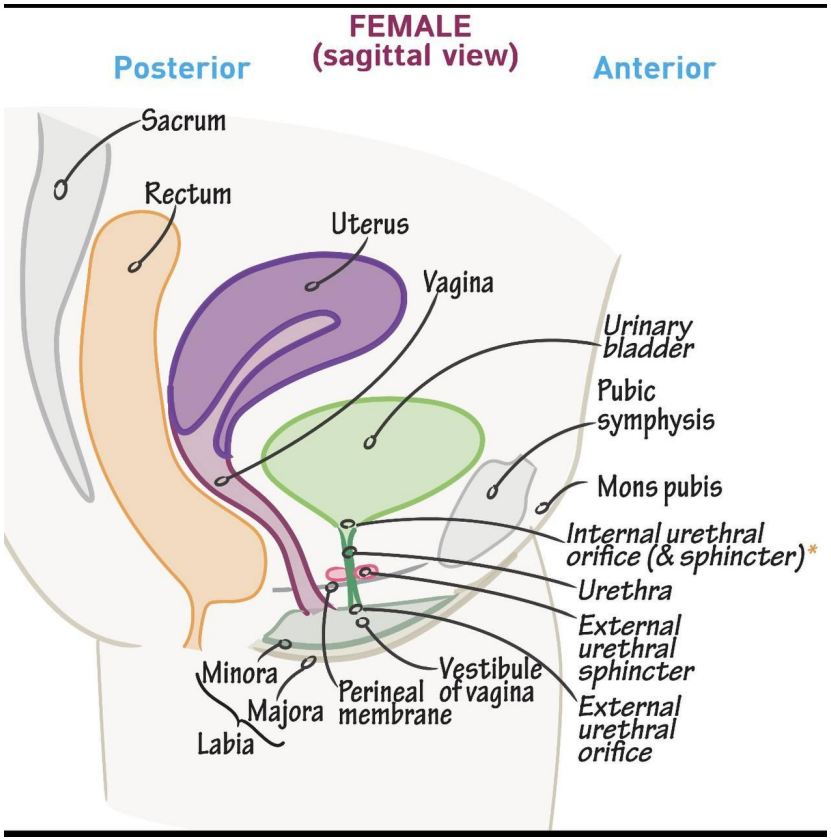
Male Bladder

- Inferior: Prostate
- Posterior: Seminal vesicles & vas deferens
- Lateral: Pelvic muscles + ureters

Female Bladder

- Superior: Uterus
- Posterior: Vagina
- Lateral: Pelvic muscles + ureters


Prepubic angle
Ejaculatory duct
Infrapubic angle
© TeachMeAnatomy
teachmeanatomy.info
The Urethra - Male - Female - Anatomical Course - Teac...


FEMALE
(sagittal view)
Posterior
Anterior
Sacrum
Rectum
Uterus
Vagina
Urinary bladder
Pubic symphysis
Mons pubis
Internal urethral orifice (& sphincter)*
Urethra
External urethral sphincter
External urethral orifice
Vestibule of vagina
Perineal membrane
Minora
Majora
Labia

- Clinical Importance
- • Bladder injury during:
- • Pelvic surgery
- • Hysterectomy
- • Prostate surgery
- • Ureteric injury may occur near bladder entry