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Physical Change and Aging: A Guide for the Helping Professions, Seventh Edition

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Chapter 11: The Urinary System

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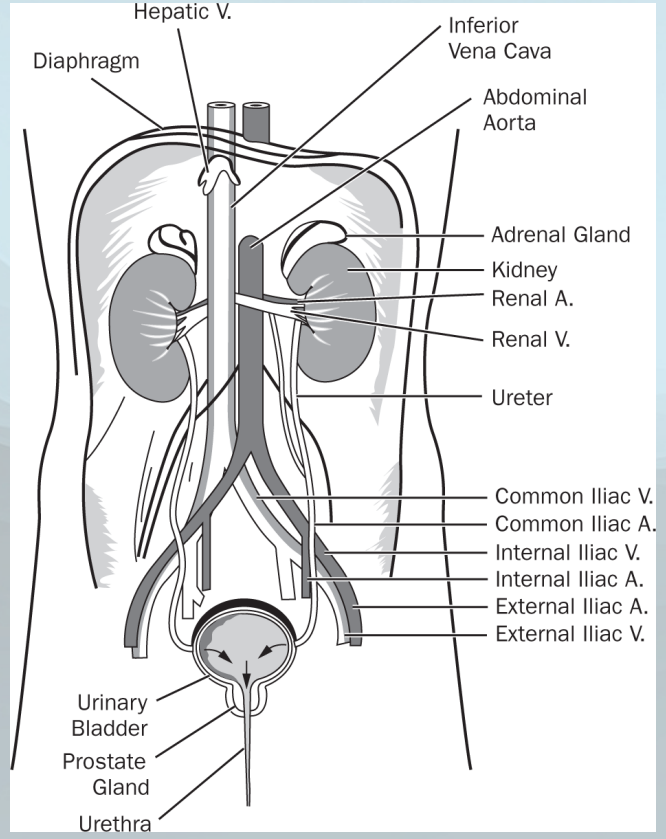
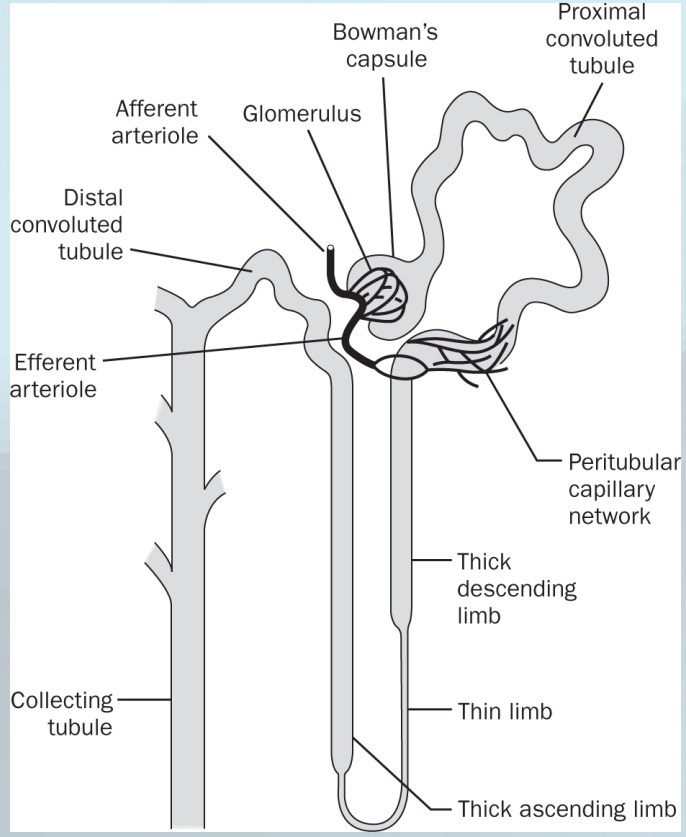
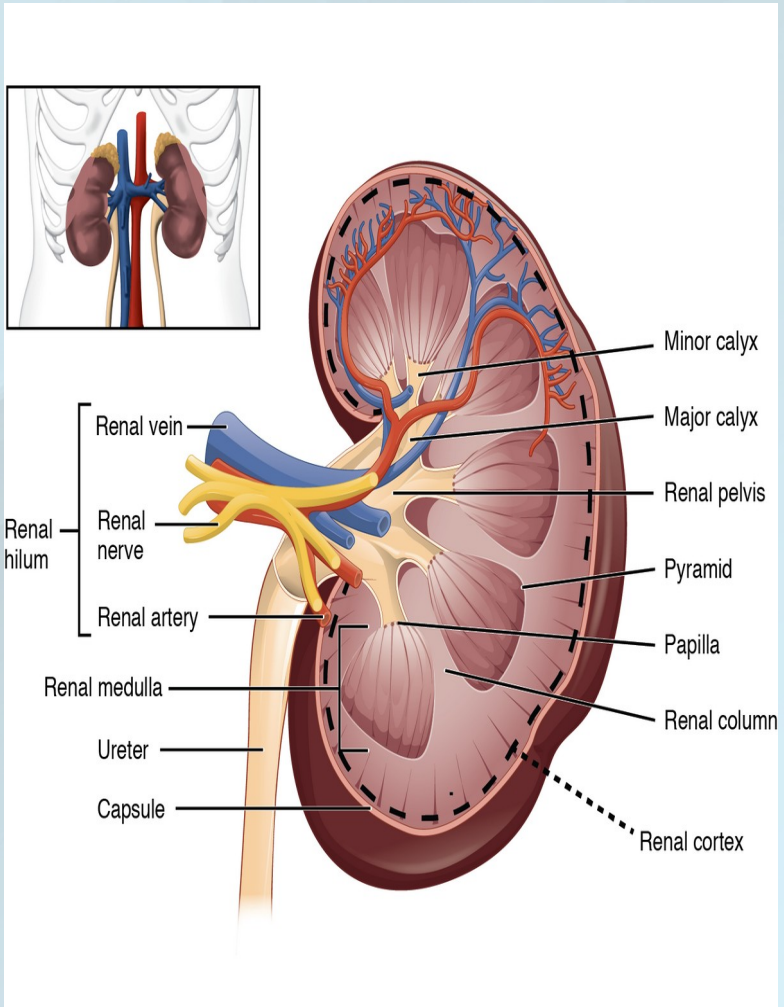
Structures of the Urinary System







Structure of the Kidneys

- **Paired, bean-shaped organs behind abdominal cavity, slightly below diaphragm**
- **About 5 inches long each**
- **Enormous reserve capacity (can still function with only 60% of nephrons)**
- **Anchored to surrounding structures by fibrous and fatty tissues**
- **Three distinct areas:**
  - **Cortex, or outer area**
  - **Medulla, below the cortex**
  - **Pelvis, continuous with the ureter**
- **Rich blood supply (renal arteries and veins)**

The Nephron

- **The basic unit of the kidney**
- **Involved in urine formation and other life-maintaining activities**
- **More than 1 million in each kidney**
- **Components:**
  - **A capsule enclosing a glomerulus (a coiled series of small blood capillaries)**
  - **An attached renal tubule**
- **Located primarily in the cortical area of the kidney**

Functions of the Urinary System

- **General**
  - **Excrete toxic substances and waste products**
  - **Regulate water balance in body**
  - **Help maintain acid–base balance in body fluids**
  - **Aid in controlling concentration of salts**
- **In urine formation and blood composition**
  - **Glomerular filtration: initial step in urine production, blood is filtered to get rid of waste.**
  - **Tubular reabsorption: the nephrons remove substances from the filtrate and back into the bloodstream**
  - **Tubular secretion: substances are removed from the blood and into the kidney tubules or filtrate and then excreted in the urine.**

Age-Related Changes in the Urinary System: Anatomical

- **Kidney size decreases by age 80**
- **Increase in glomerular sclerosis (hardening)**
- **Decline in number of cells of renal tubules**
- **Increase in tubular diverticula**
- **Thickening of tubular walls**
- **Blood vessels in kidneys smaller and thicker**
- **Loss of tone and elasticity in ureters, bladder**
- **Decline in bladder capacity**

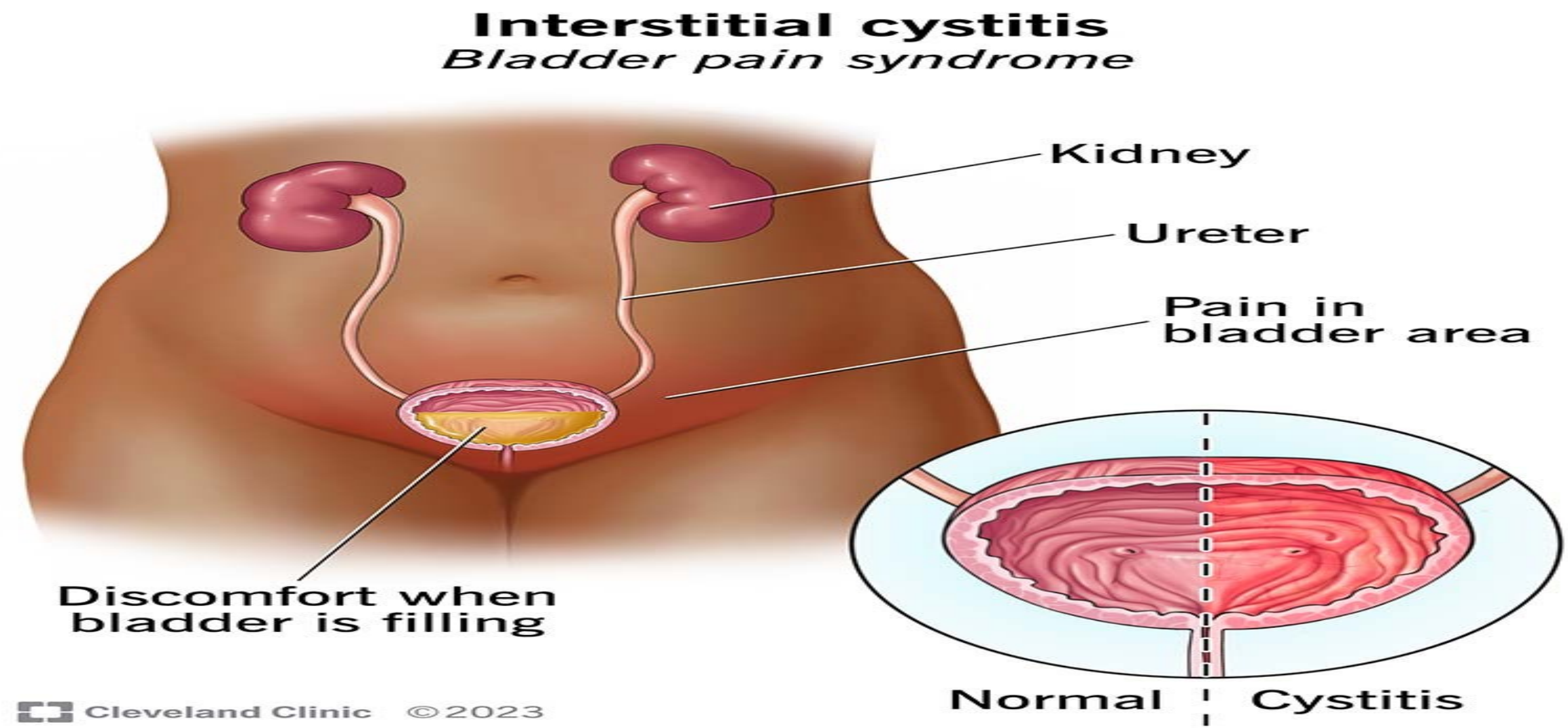
Age-Related Changes in the Urinary System: Functional

- **Renal blood flow decreases**
- **Glomerular filtration rate declines**
- **Ability to concentrate urine is decreased**
- **Maintaining acid–base balance is difficult**
- **Regulating sodium and potassium levels is difficult**

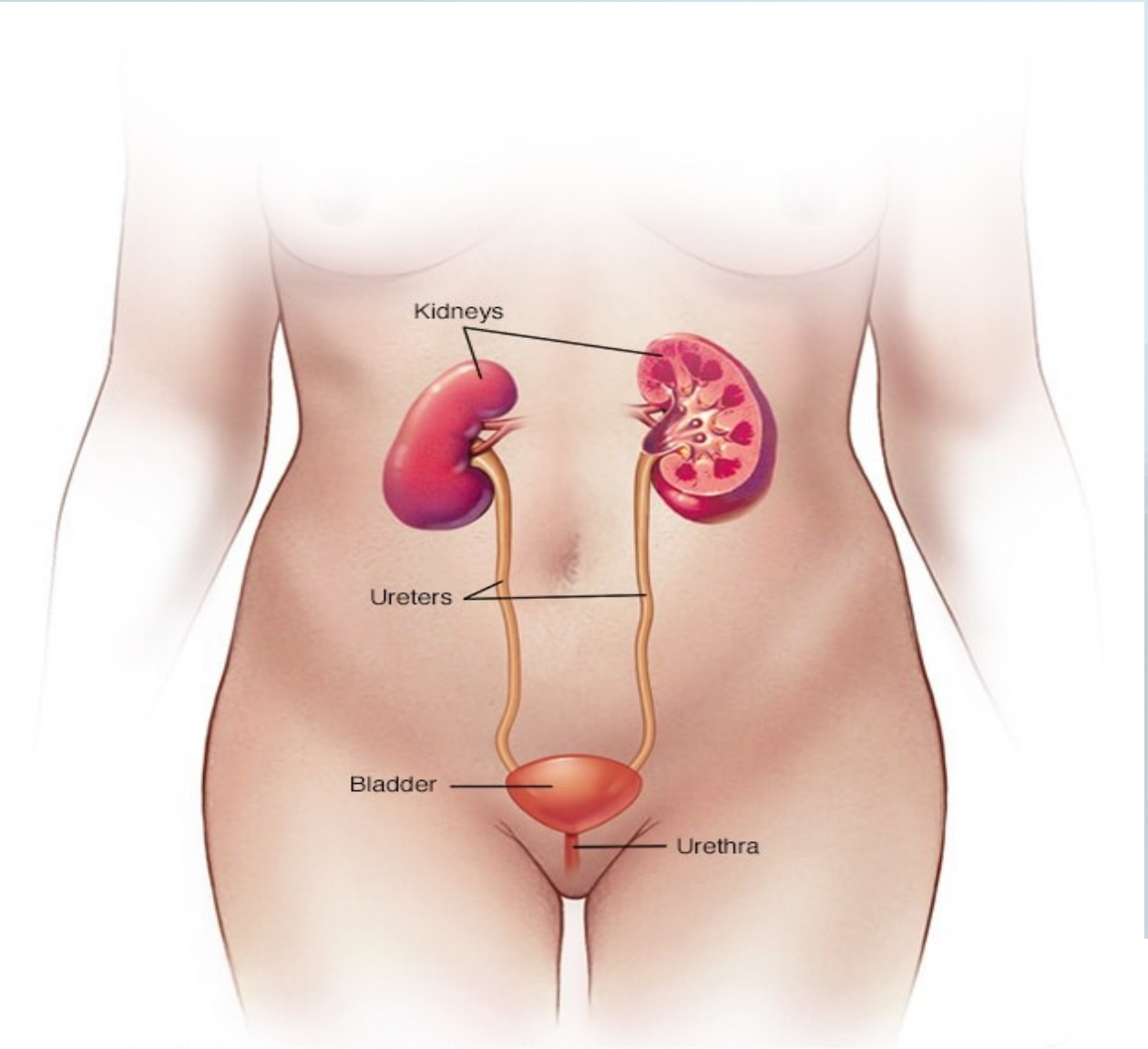
Age-Related Disorders of the Urinary System

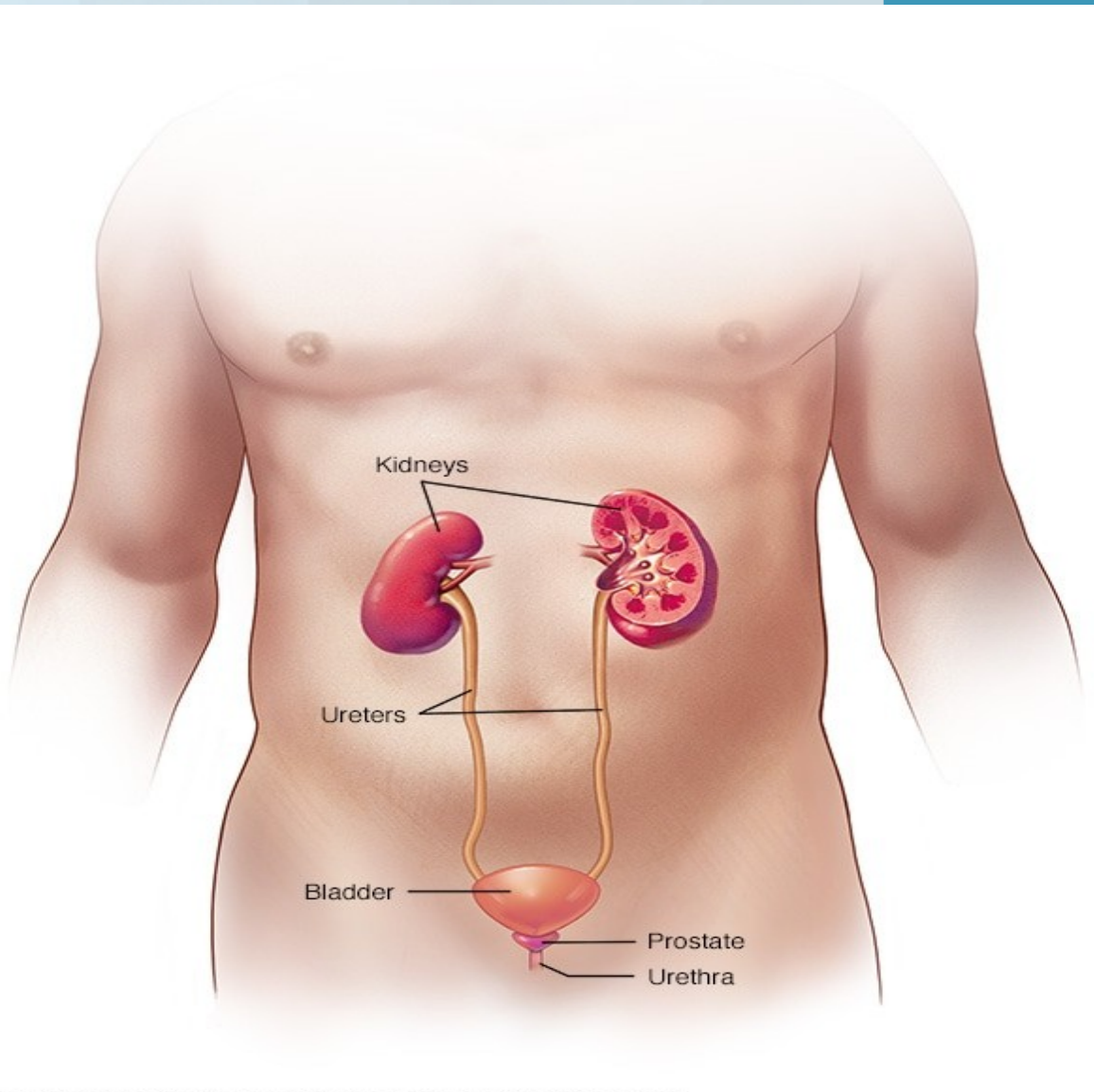
- **Urinary tract infections**
- **Cystitis (lower urinary tract infection)**
- **Pyelonephritis (upper urinary tract infection)**
- **Benign prostatic hyperplasia**
- **Urolithiasis (kidney stone disease)**
- **Cancer of the bladder**
- **Urinary incontinence**
- **Renal failure**

Cystitis


Interstitial cystitis
Bladder pain syndrome
Kidney
Ureter
Pain in bladder area
Discomfort when bladder is filling
Normal
Cystitis
Cleveland Clinic ©2023

Urinary Tract Infection





Pyelonephritis

Symptoms of Kidney Infection

Fever.

Pain in your lower back or side.

Chills.

Pain when you pee.

Bloody or cloudy pee that might smell bad.

Urgent or frequent need to pee.

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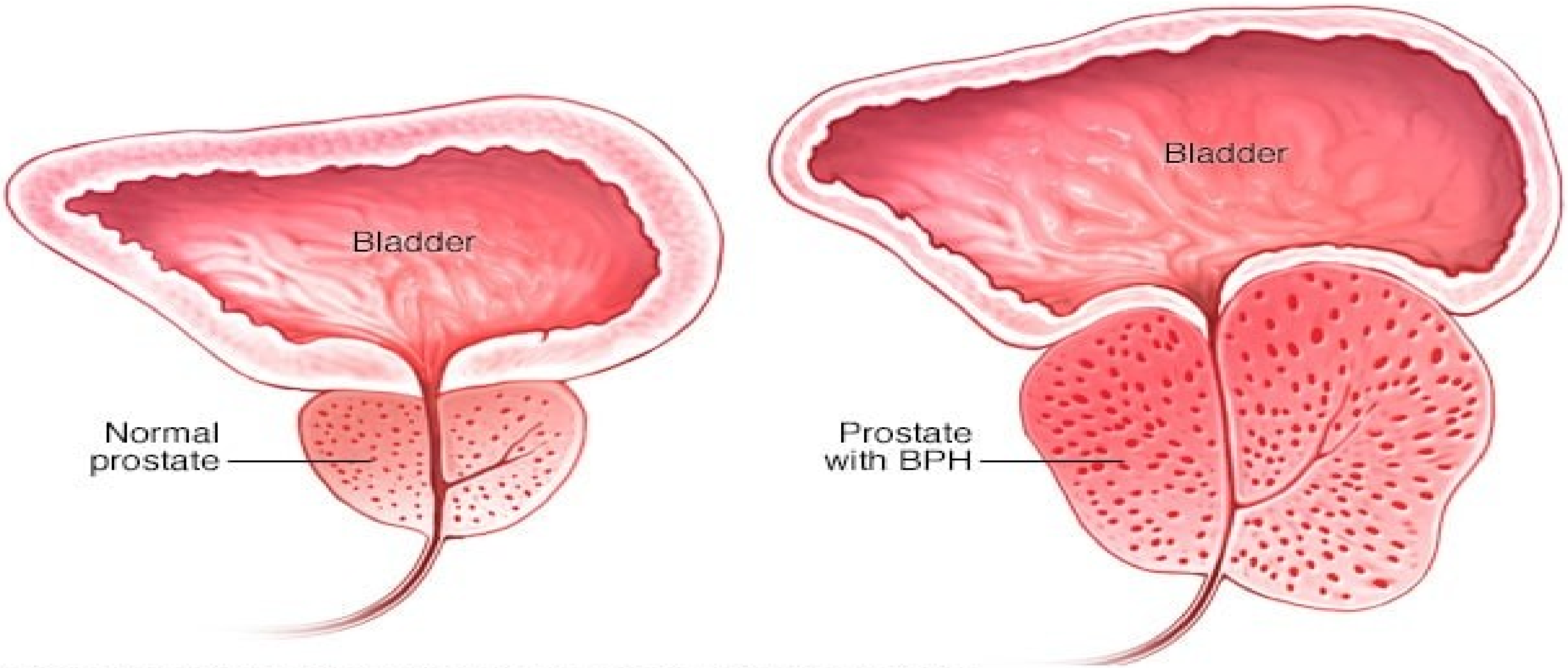
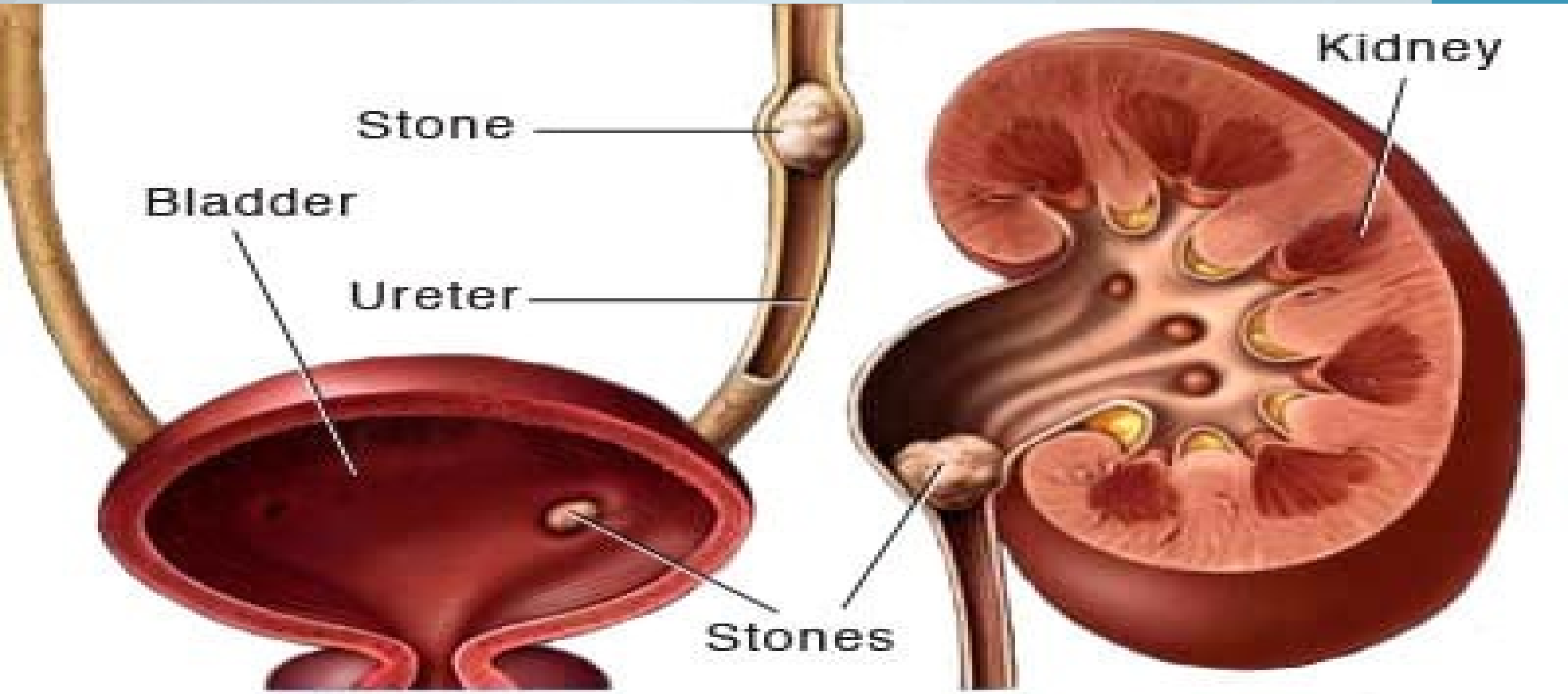
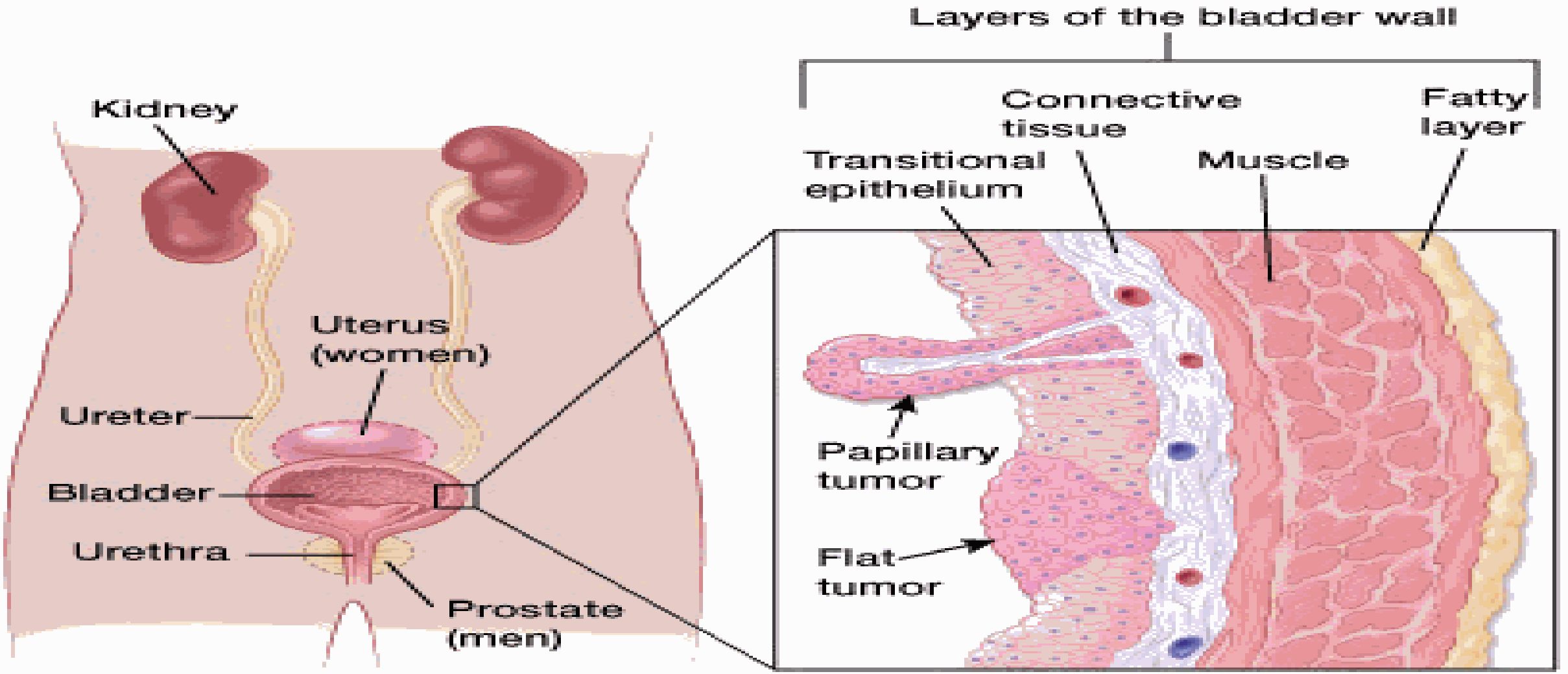
Benign Prostatic Hypertrophy



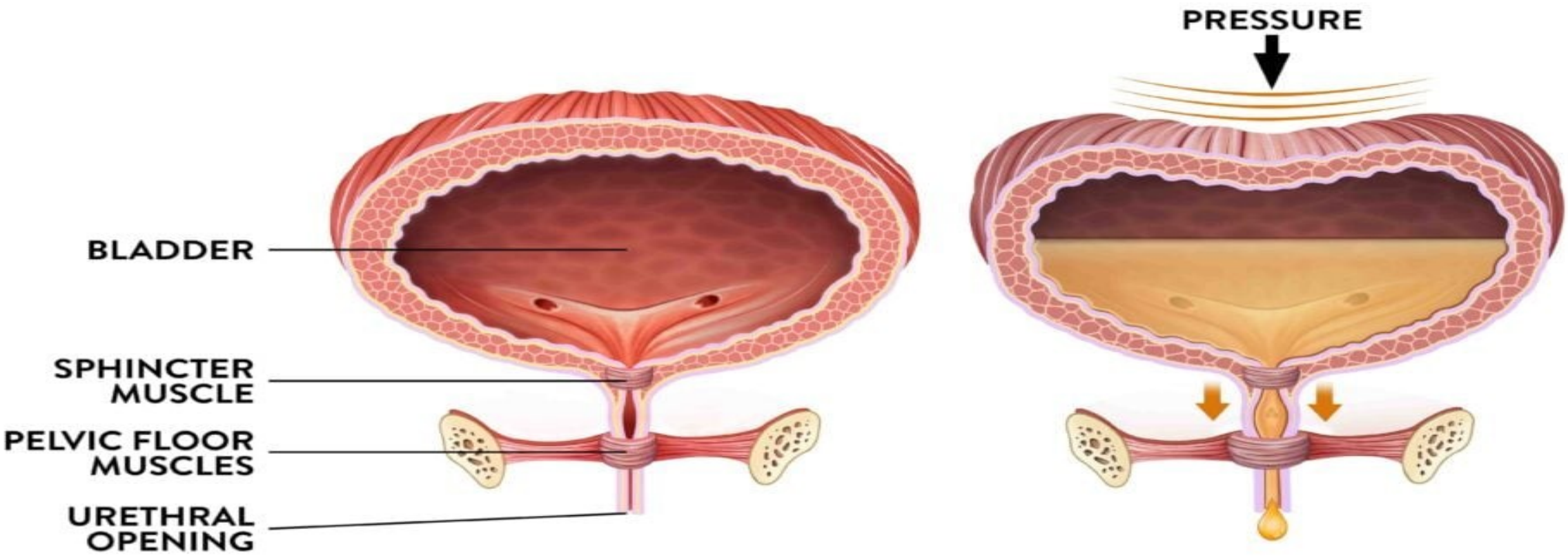
Kidney Stones



Bladder Cancer



Incontinence



Warning Signs of Kidney Failure

Extreme tiredness (fatigue).

Nausea and vomiting.

Confusion or trouble concentrating.

Swelling (edema), particularly around your hands or ankles.

Poor appetite or food may taste metallic.

Cramps (muscle spasms).

Peeing more often.

Dry or itchy skin.

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Promoting Urinary Wellness in Older Adults*

- **Maintain a healthy diet**
- **Stay adequately hydrated.**
- **Engage in regular exercise.**
- **Women especially should wipe from front to back after going to the bathroom to avoid UTIs.**
- **Kegal exercises can help the bladder to hold u[illegible] may help to prevent urine seepage.**
- **Use caution of alcohol and caffeine consumption.**
- **Be familiar with your medications and how these may side effects which effect the urinary system and report side effects to health care provider.**
- **Empty your bladder completely when you urinate.**