

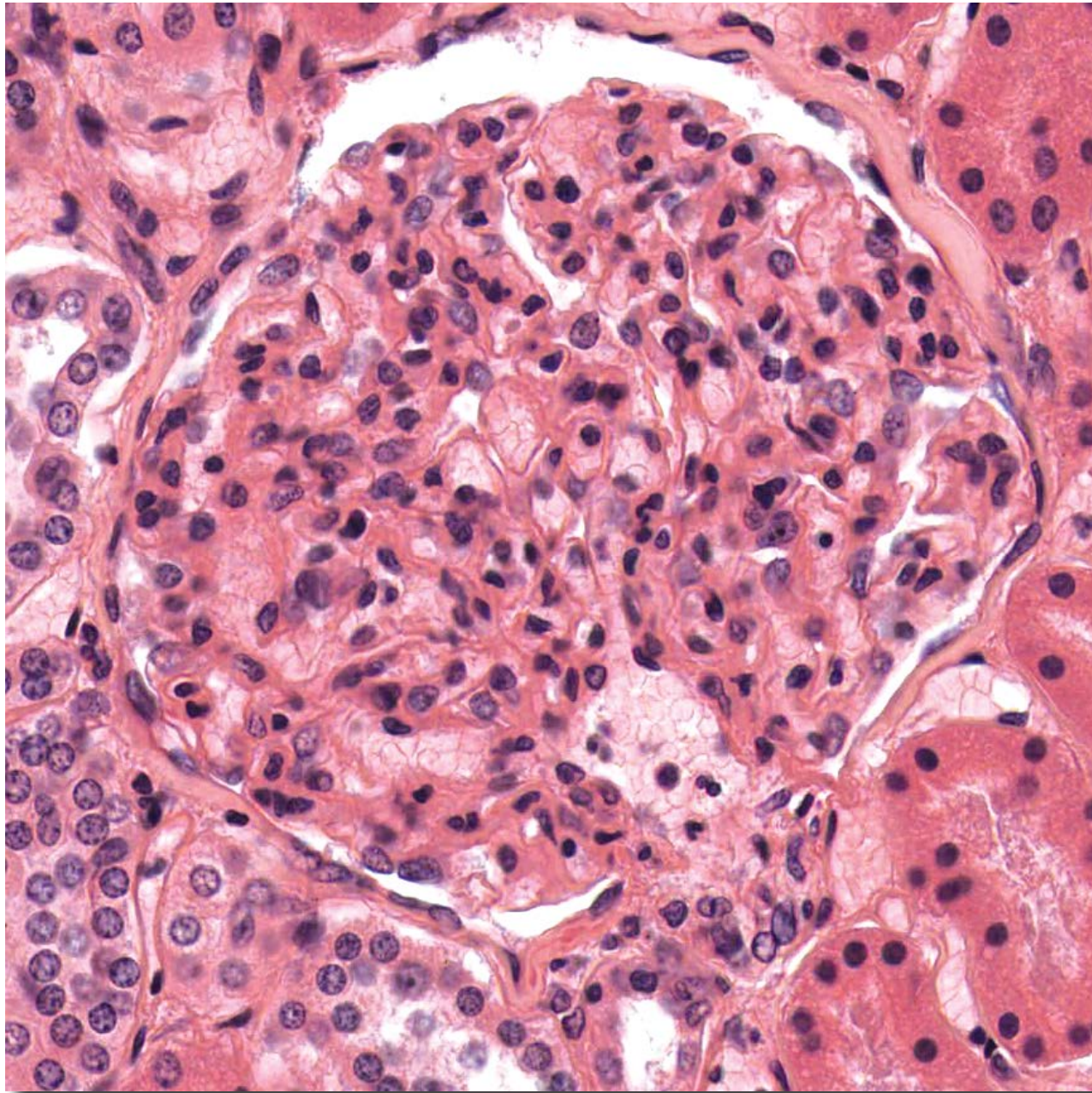
Kidney and Urinary Tract/ Male Reproductive Diseases

Henry Sánchez, M.D.

Normal Kidney



Normal Glomerulus



Introduction

- Glomerulus
- Tubules
- Interstitium
- Vasculature

Uremia

- Definition

- A clinical syndrome due to either destruction of parenchyma or functional loss of renal tissue
- Other terms include renal failure or insufficiency

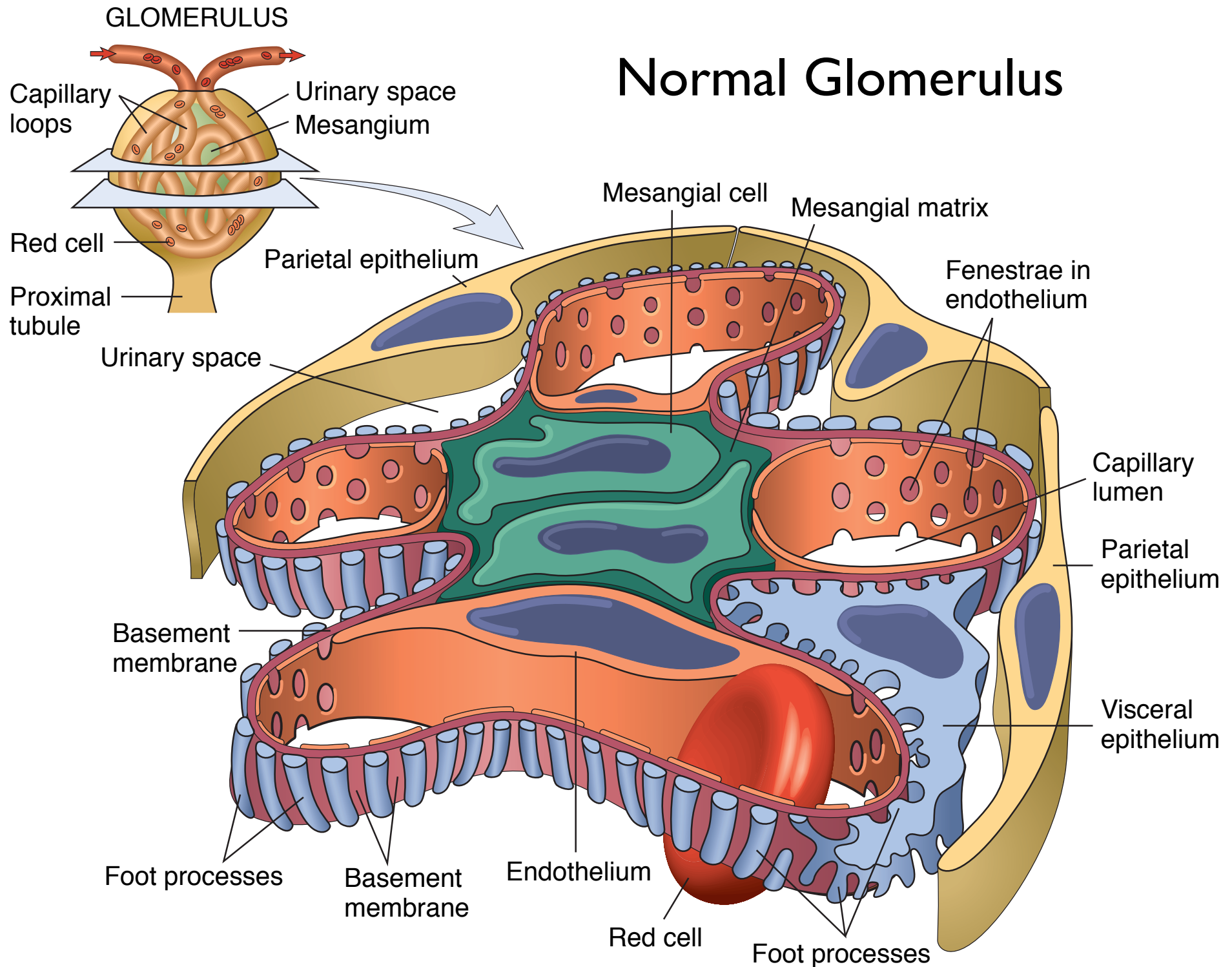
- Biochemical disturbances including Na^+ and H_2O retention, azotemia, acidosis, hyperkalemia and hyperphosphatemia

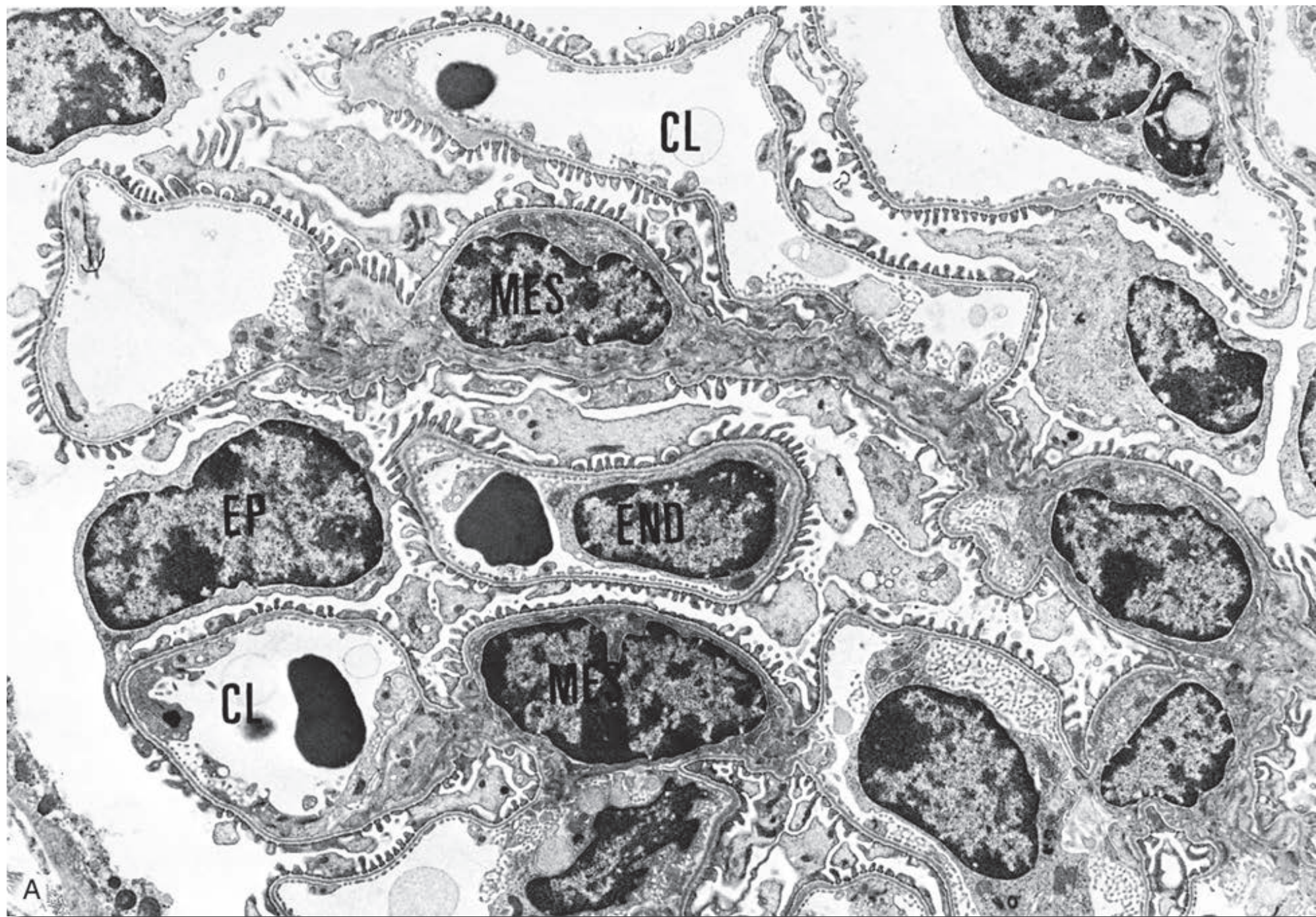
Pathology of Uremia

- Multiple organs and tissues will be affected
 - Skin: uremic dermatitis
 - CV system: myocardial hypertrophy, uremic pericarditis
 - Lungs: uremic pneumonitis
 - GI tract: uremic colitis
 - Nervous system: uremic encephalitis, retinopathy and peripheral neuropathy

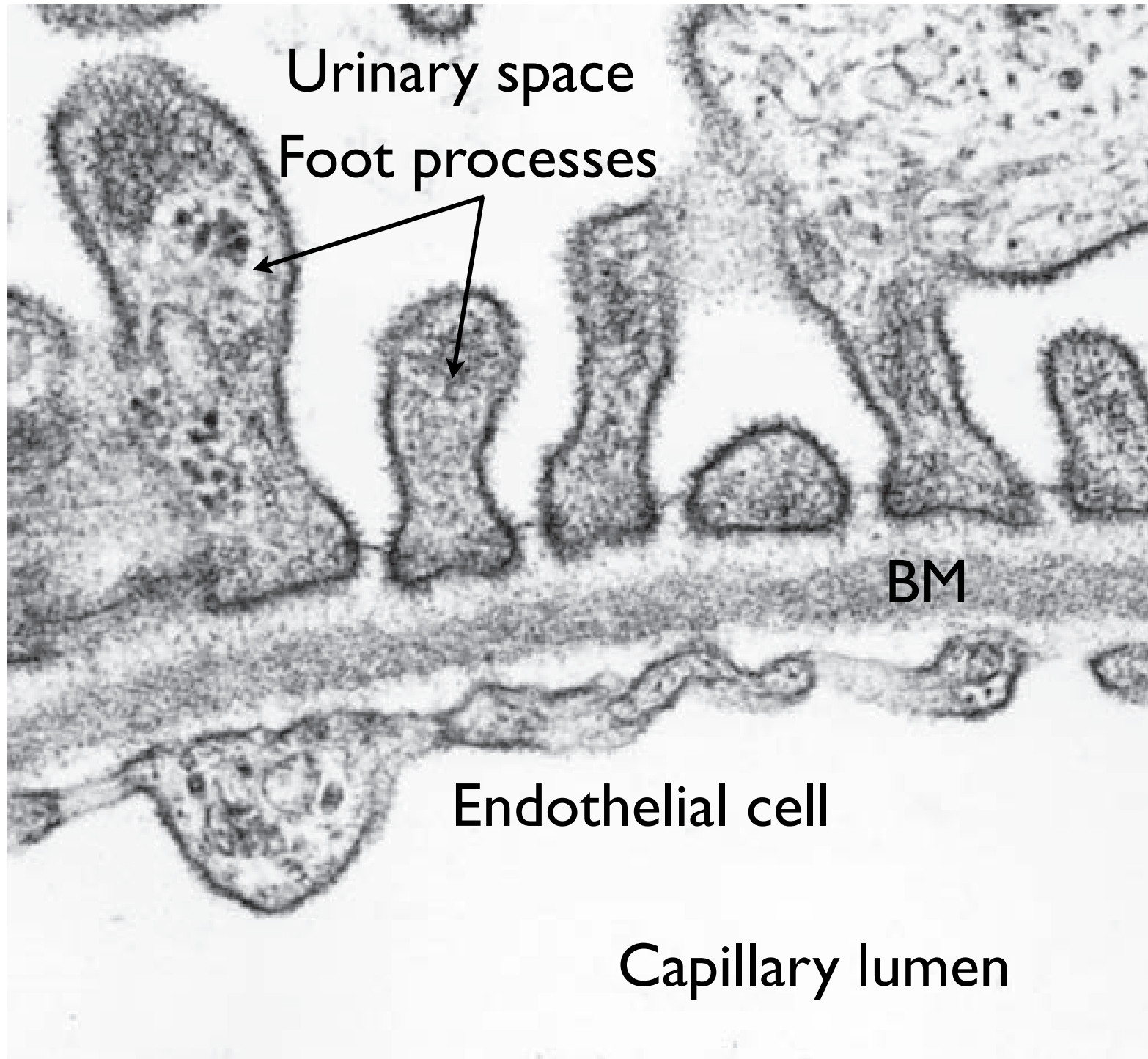
Glomerular Diseases

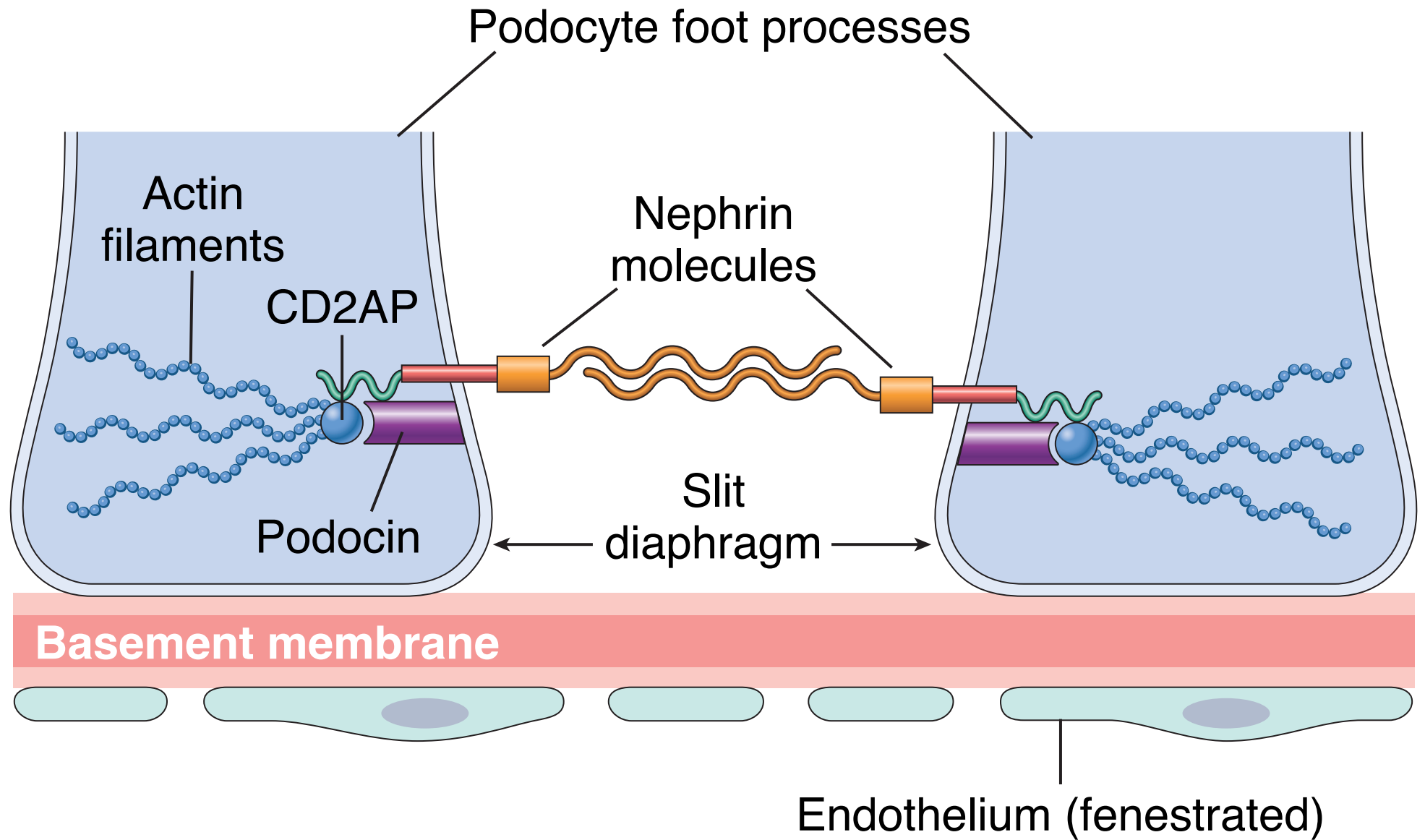
Normal Glomerulus





A





Glomerular Diseases

- Inflammatory Diseases

- Nephritic syndrome

- Mild to moderate hypertension

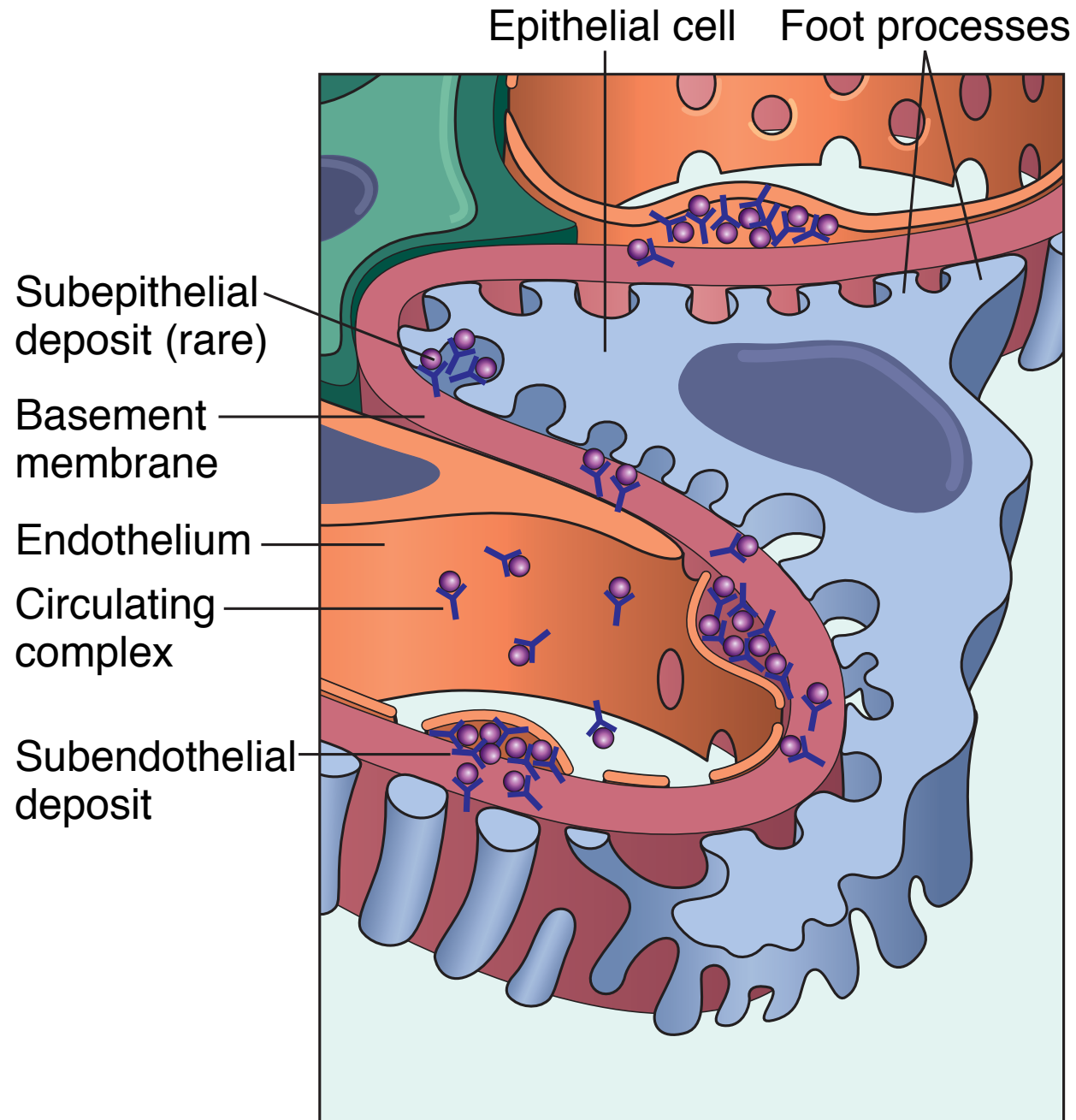
- Proteinuria

- Hematuria

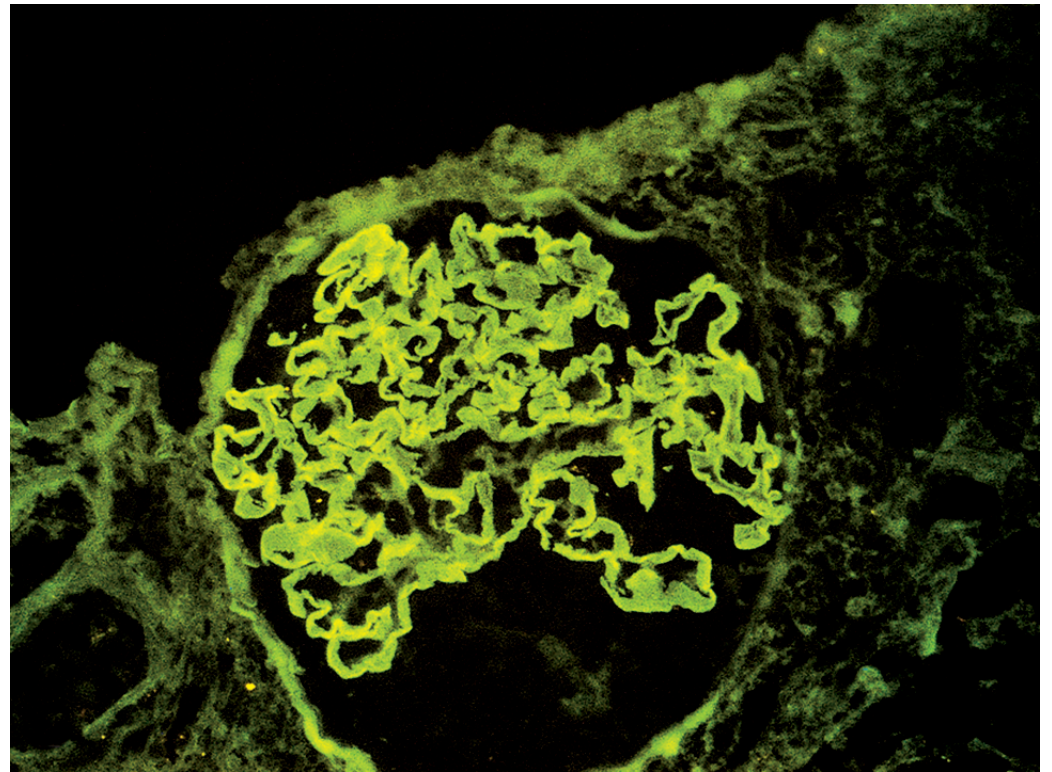
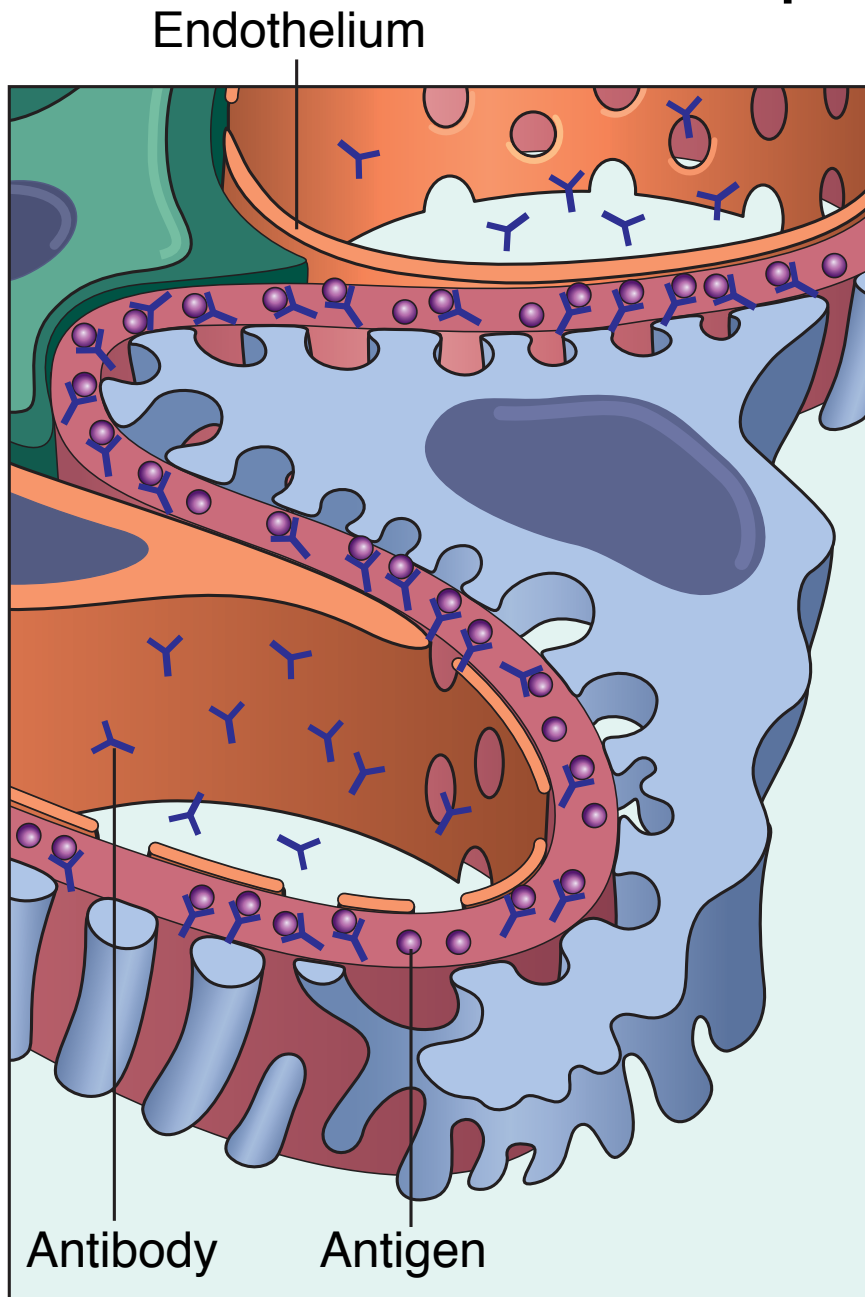
- Azotemia

- Oliguria or anuria

IMMUNE COMPLEX DEPOSITION



Goodpasture Syndrome



Glomerular Diseases

- Non-inflammatory Diseases

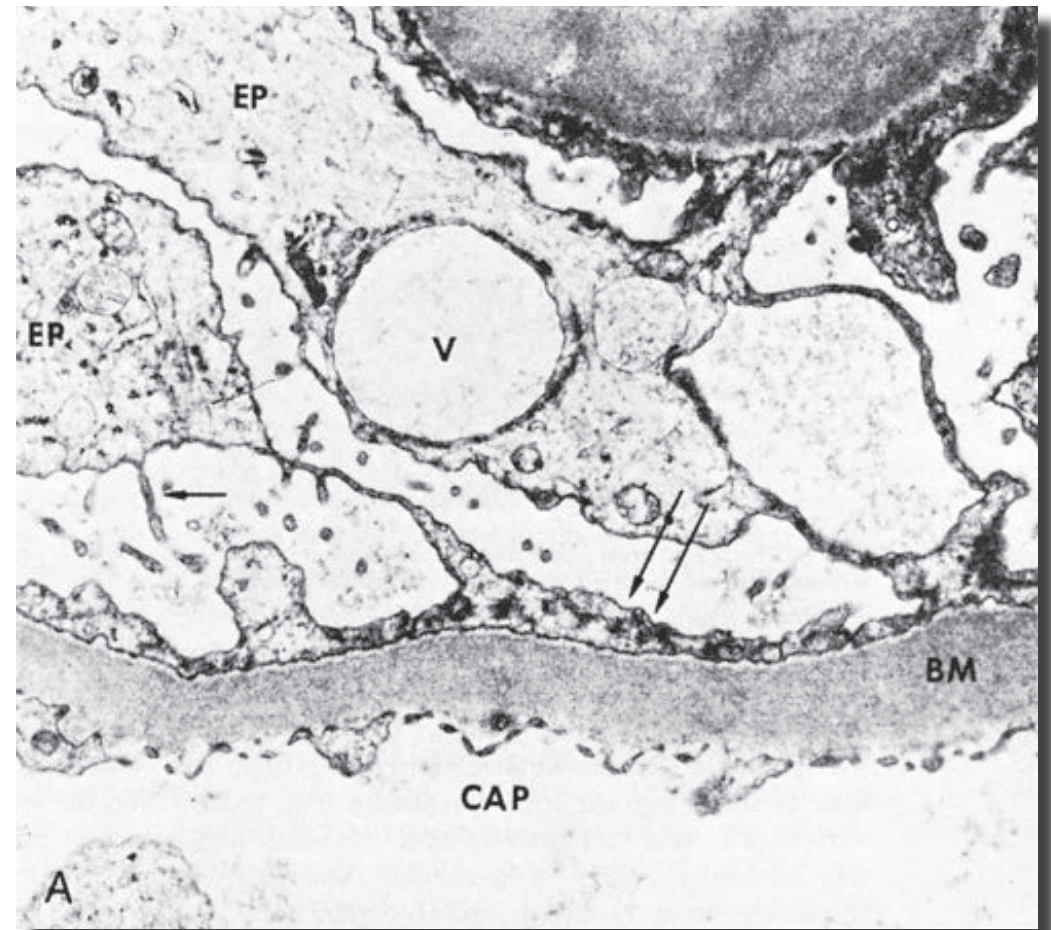
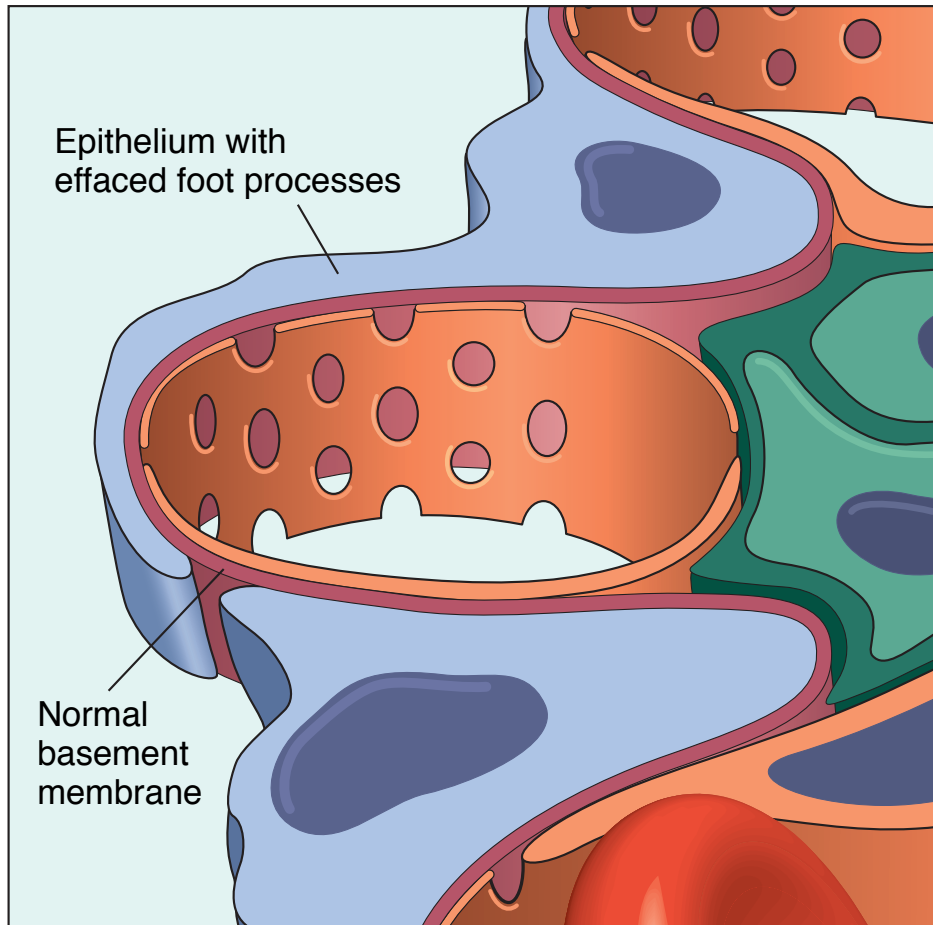
- Nephrotic syndrome

- Increased permeability of glomerular capillary walls to plasma proteins
- Loss albumin induces mobilization of lipids leading to hyperlipidemia and lipiduria

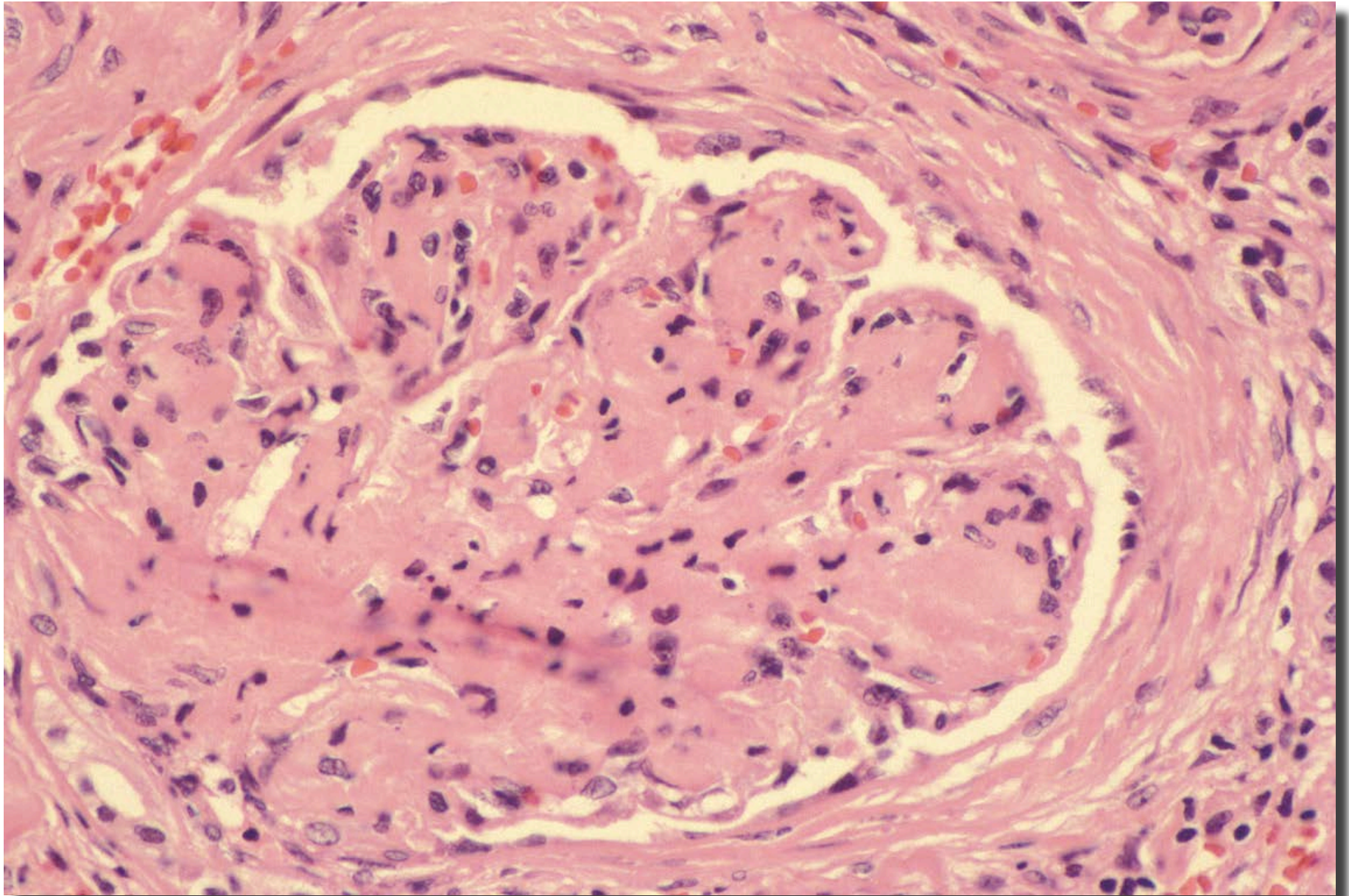
Nephrotic Syndrome

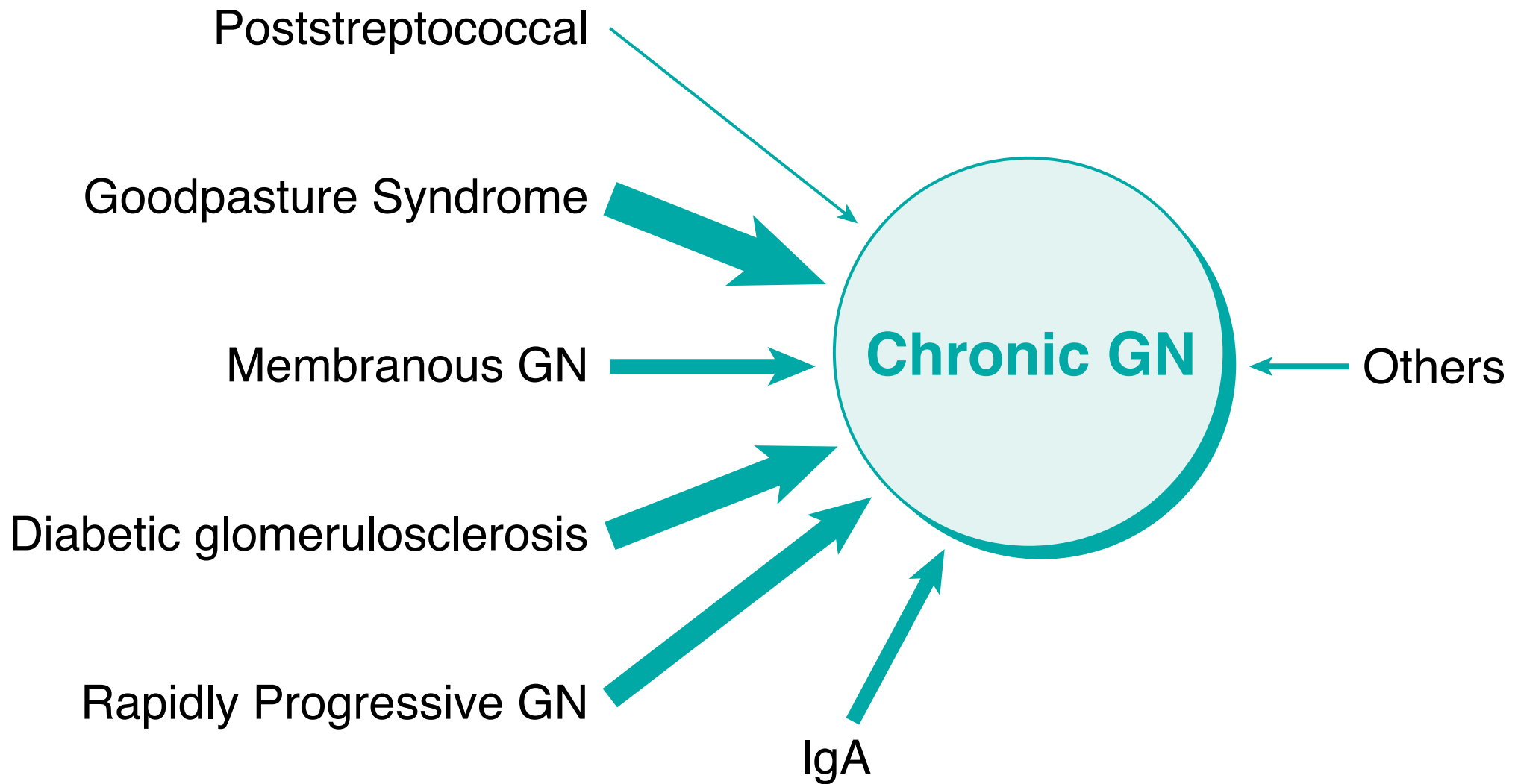
- **Mass proteinuria** - urinary excretion in excess of 3.5 gm/24 hr/1.73 m² of body surface
- **Hypoalbuminemia** - plasma levels of albumin 3.0 gm/dL or less
- **Hyperlipidemia** - serum cholesterol in excess of 300 mg/dL
- **Lipiduria** - free fat droplets
- **Edema** - anasarca

Minimal Change Disease

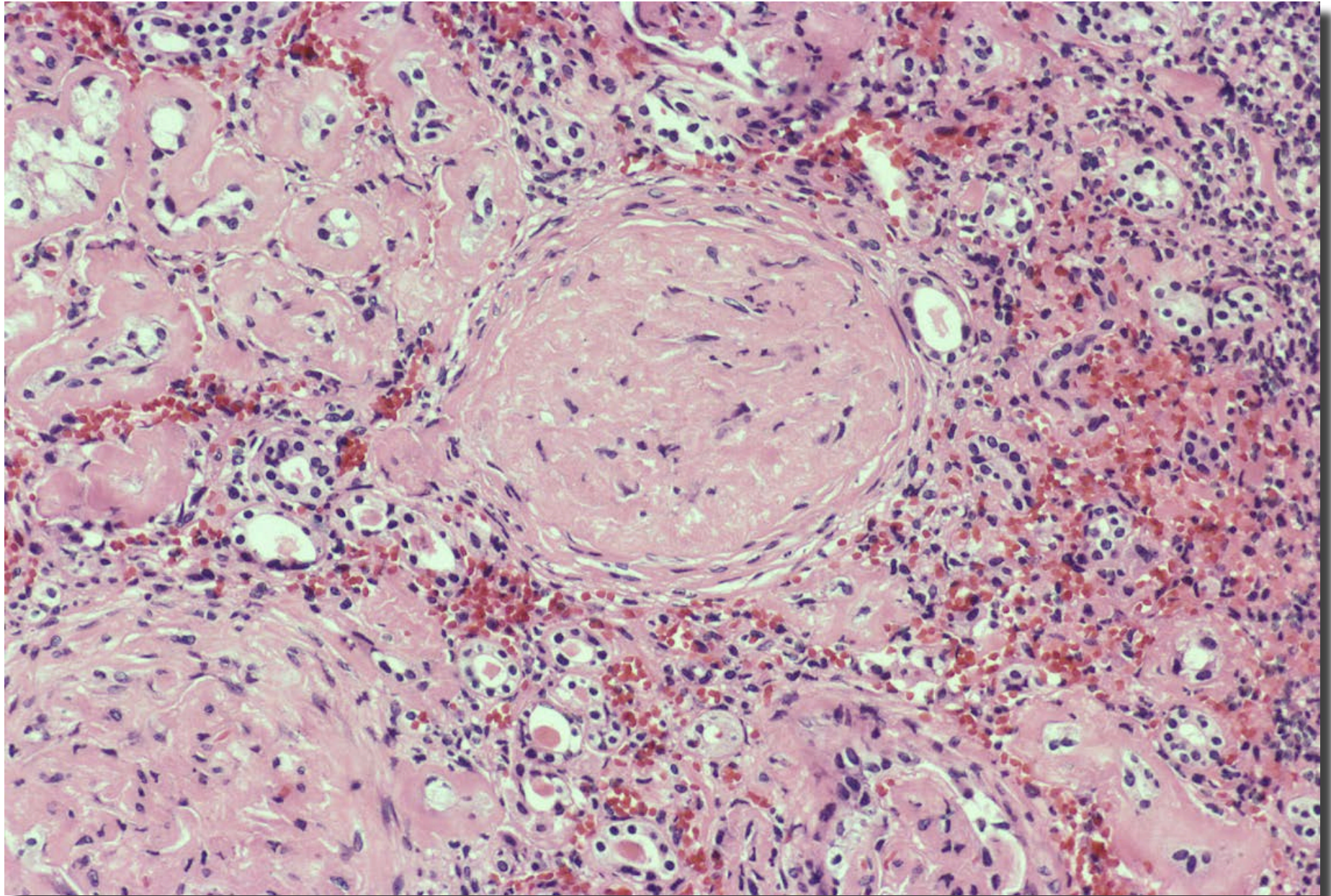


Diabetic Glomerulosclerosis





End-Stage Glomerular Disease



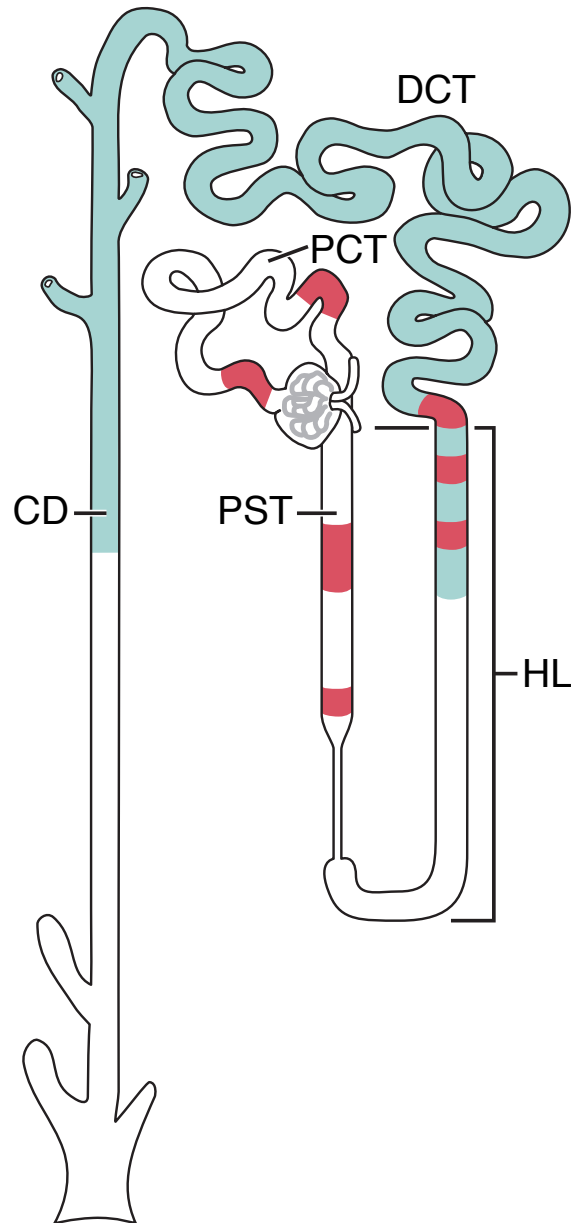
Tubulo-Interstitial Diseases

Acute Tubular Necrosis

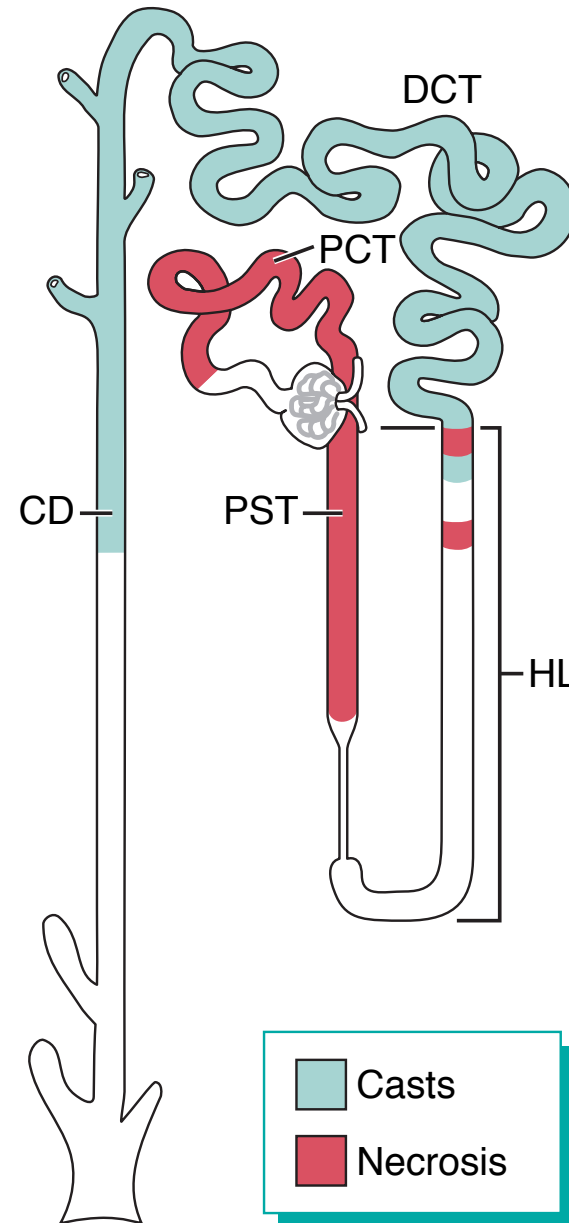
- Synonyms - “ATN”, “acute renal failure”, “vasoactive nephropathy”
- Etiology
 - Acute ischemia
 - Chemicals - mercury chloride, CCl₄, uranium, diethylene glycol
 - Drugs - antibiotic including kanamycin, gentamycin, amphotericin B, degraded tetracycline)

Acute Tubular Necrosis

ISCHEMIC TYPE



TOXIC TYPE



■ Casts
■ Necrosis

Acute Tubular Necrosis

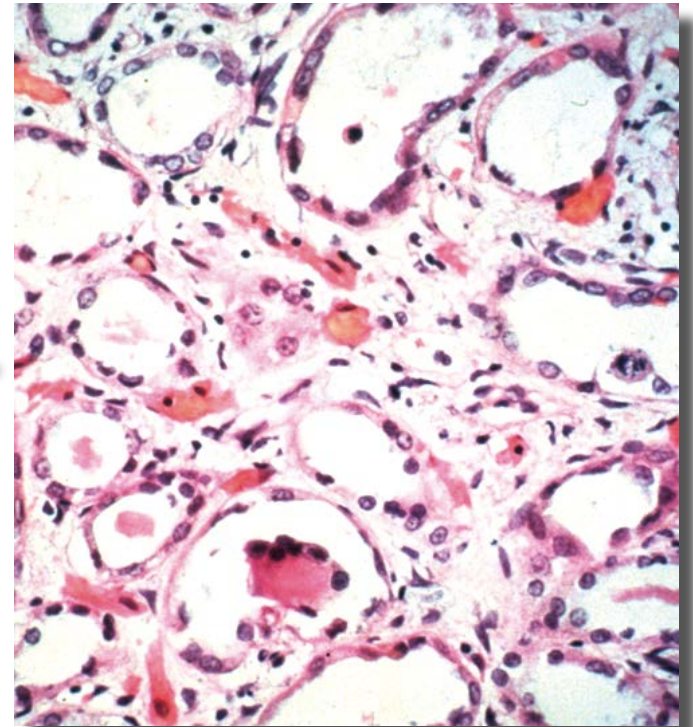
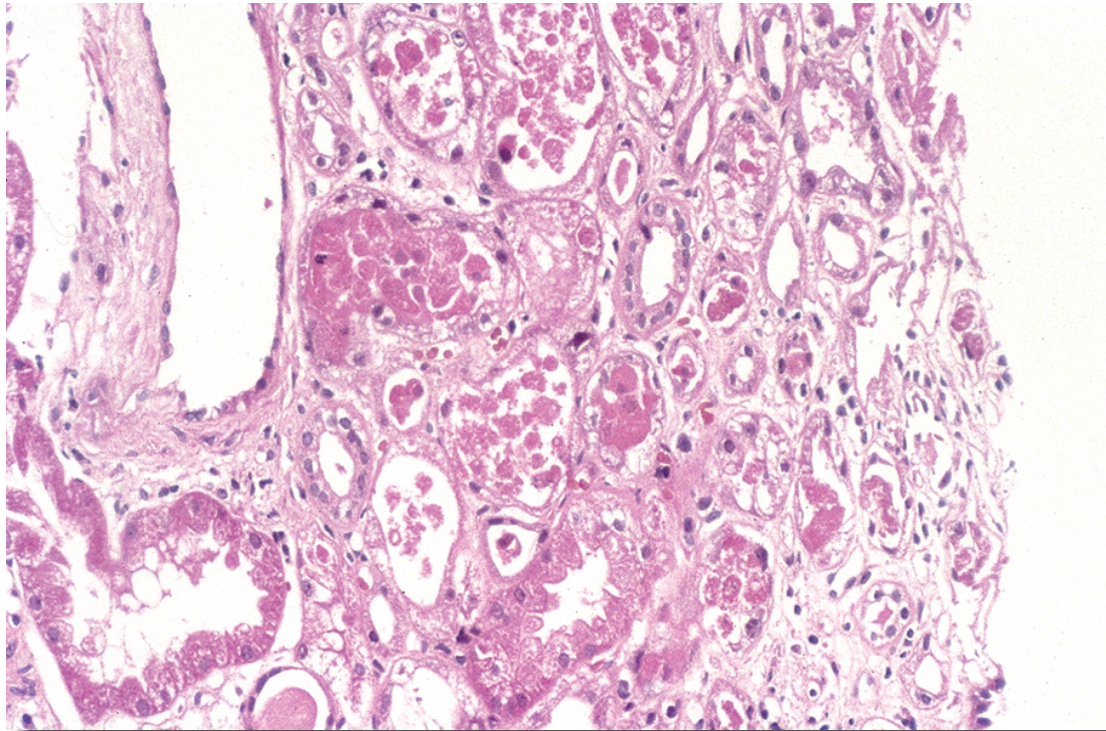
● Clinical Aspects

- Rapidly developing oliguria or anuria and uremia
- Death or full recovery of renal function

● Mechanisms of Anuria

- Failure of glomerular filtration (vasoconstriction)
- Tubular obstruction
- Tubular disruption

Acute Tubular Necrosis



Allergic Tubulo-Interstitial Nephritis

- Acute interstitial inflammation with numerous eosinophils and neutrophils due to antibodies against tubular antigens
- Etiology - methicillin, other penicillin derivatives, cephalosporins and thiazide diuretics
- Tubular damage is directly related to the degree of interstitial inflammation

Acute and Chronic Pyelonephritis

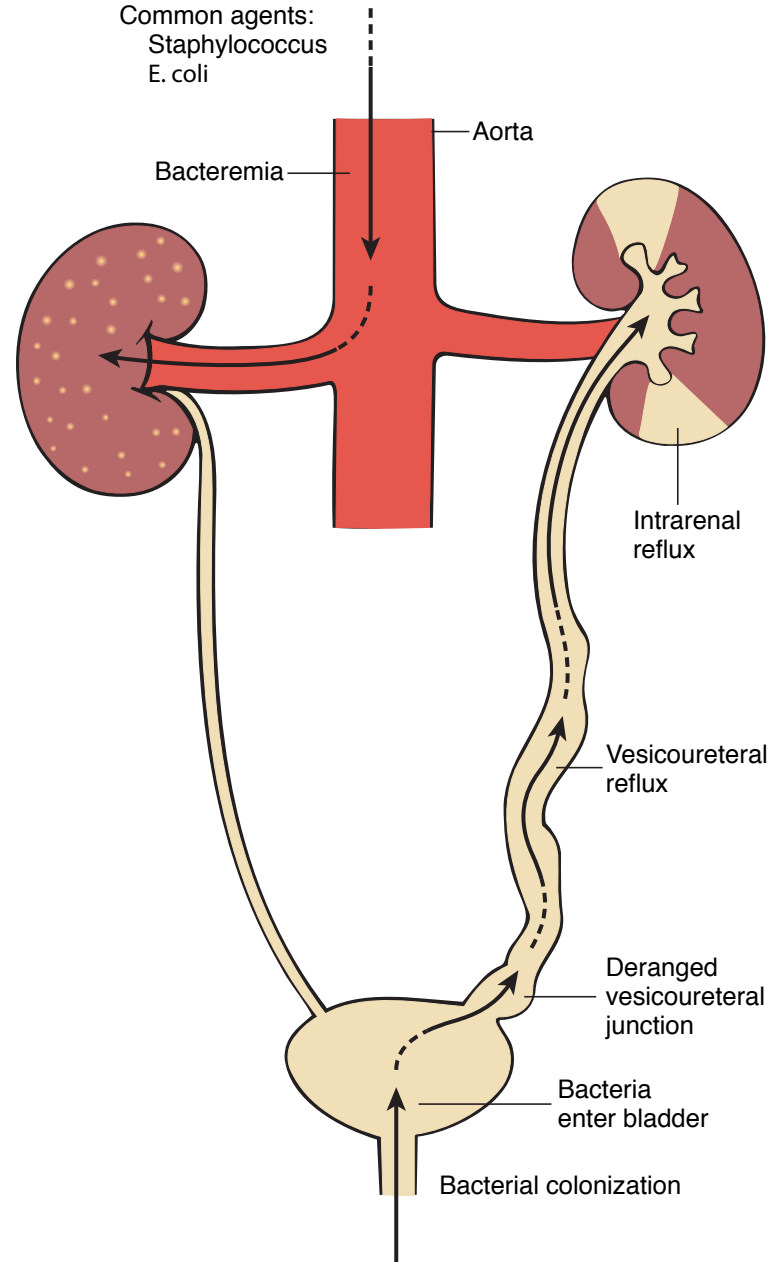
- Inflammation of the renal pelvis extending into renal parenchyma usually from lower urinary tract (cystitis)
- Acute episodes often self-limiting with residual scarring
- Chronic pyelonephritis - repeated bouts of acute infection
- Etiology
 - *E. coli* - most important
 - *Proteus vulgaris*, *Pseudomonas*, *Aerobacter* species

Acute and Chronic Pyelonephritis

- Pathogenesis - ascending route of infection
- Predisposing factors
 - Functional or mechanical urinary obstruction with stasis of urine
 - Vesico-ureteral reflux
 - Calculi
 - Pregnancy and diabetes
 - Catheterization & instrumentation of lower urinary tract

HEMATOGENOUS INFECTION

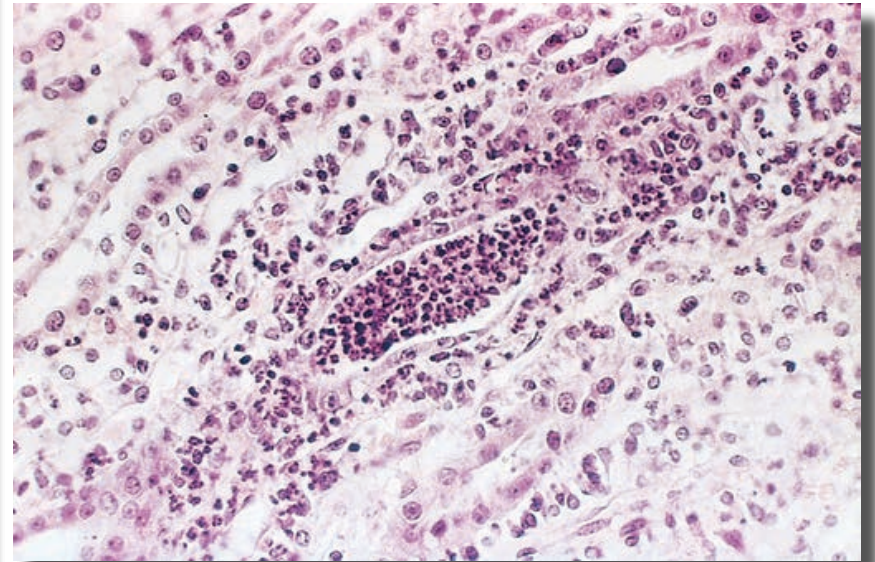
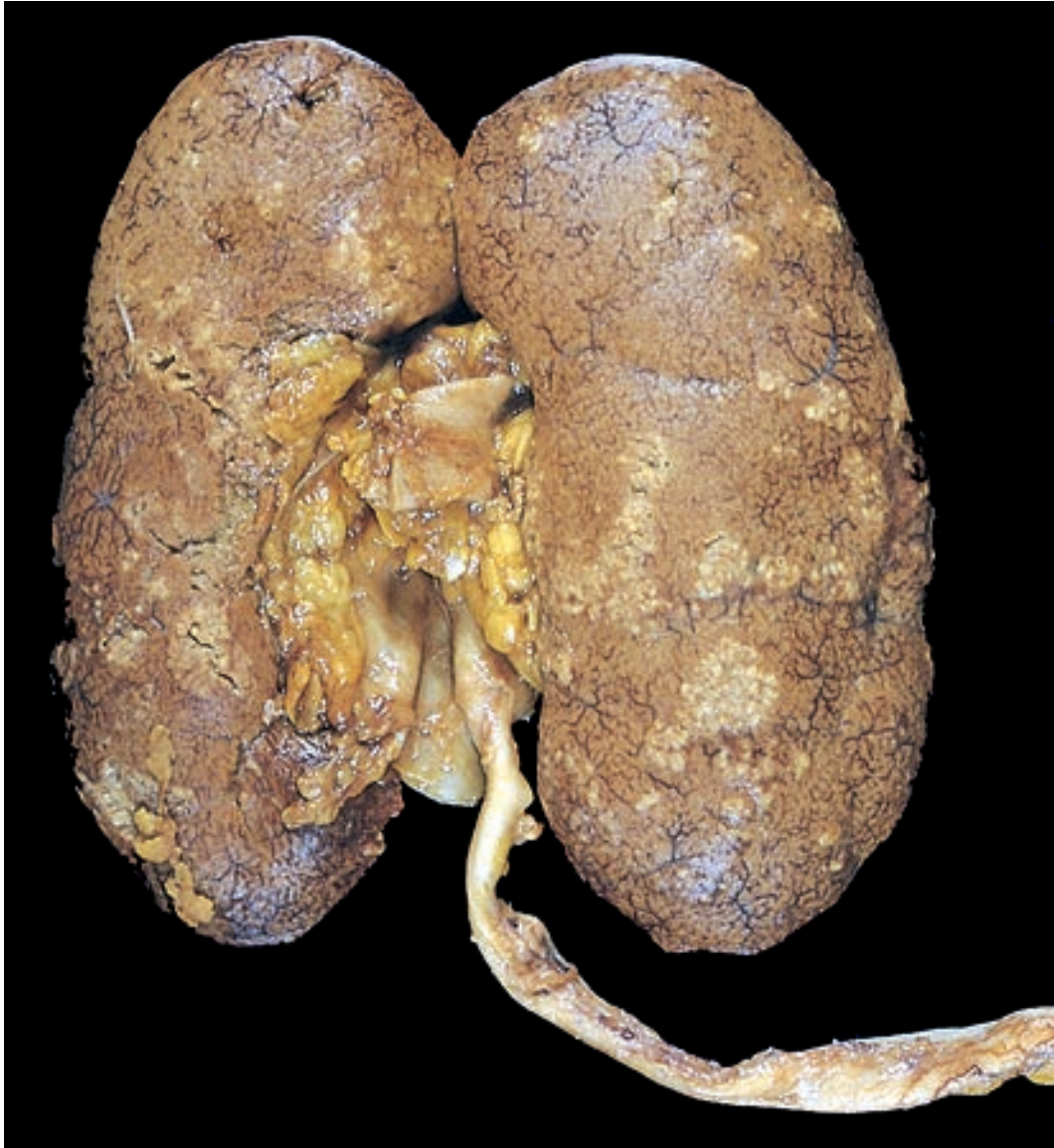
Common agents:
Staphylococcus
E. coli



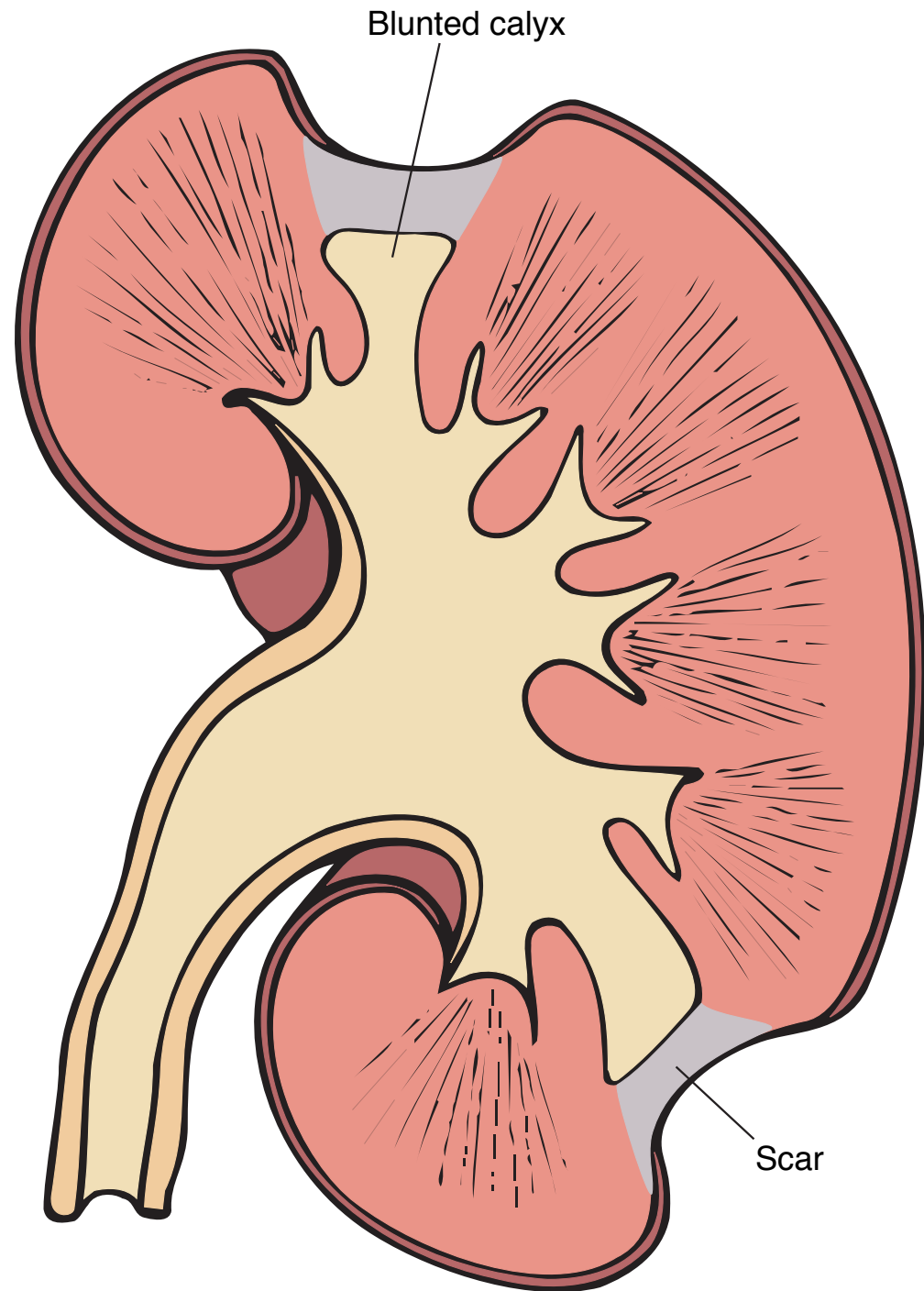
ASCENDING INFECTION

Common agents:
E. coli
Proteus
Enterobacter

Acute Pyelonephritis



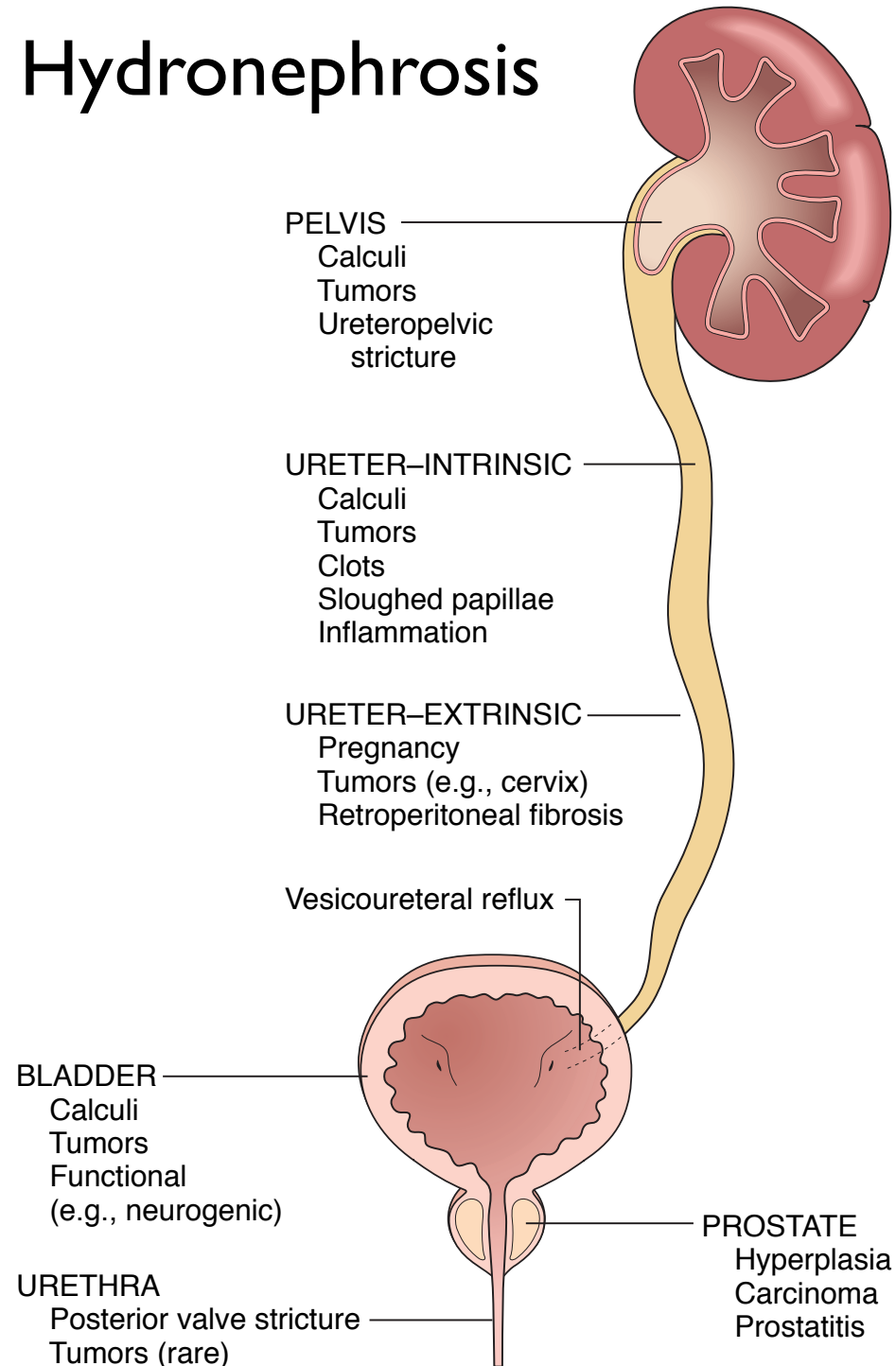
Chronic Pyelonephritis



Chronic Pyelonephritis



Hydronephrosis



Hydronephrosis



Renal Stone



Polycystic Kidney Disease

Adult Polycystic Kidney Disease

- Most common form of polycystic kidney disease
- Autosomal dominant
- Incidence - 1:500 persons affected
- Saccular and cystic dilatations of tubules affecting all portions of the nephrons
- Associated with cysts in liver (50%) and other organs (pancreas), cerebral berry aneurysms (15%) & mitral valve prolapse

Adult Polycystic Kidney Disease



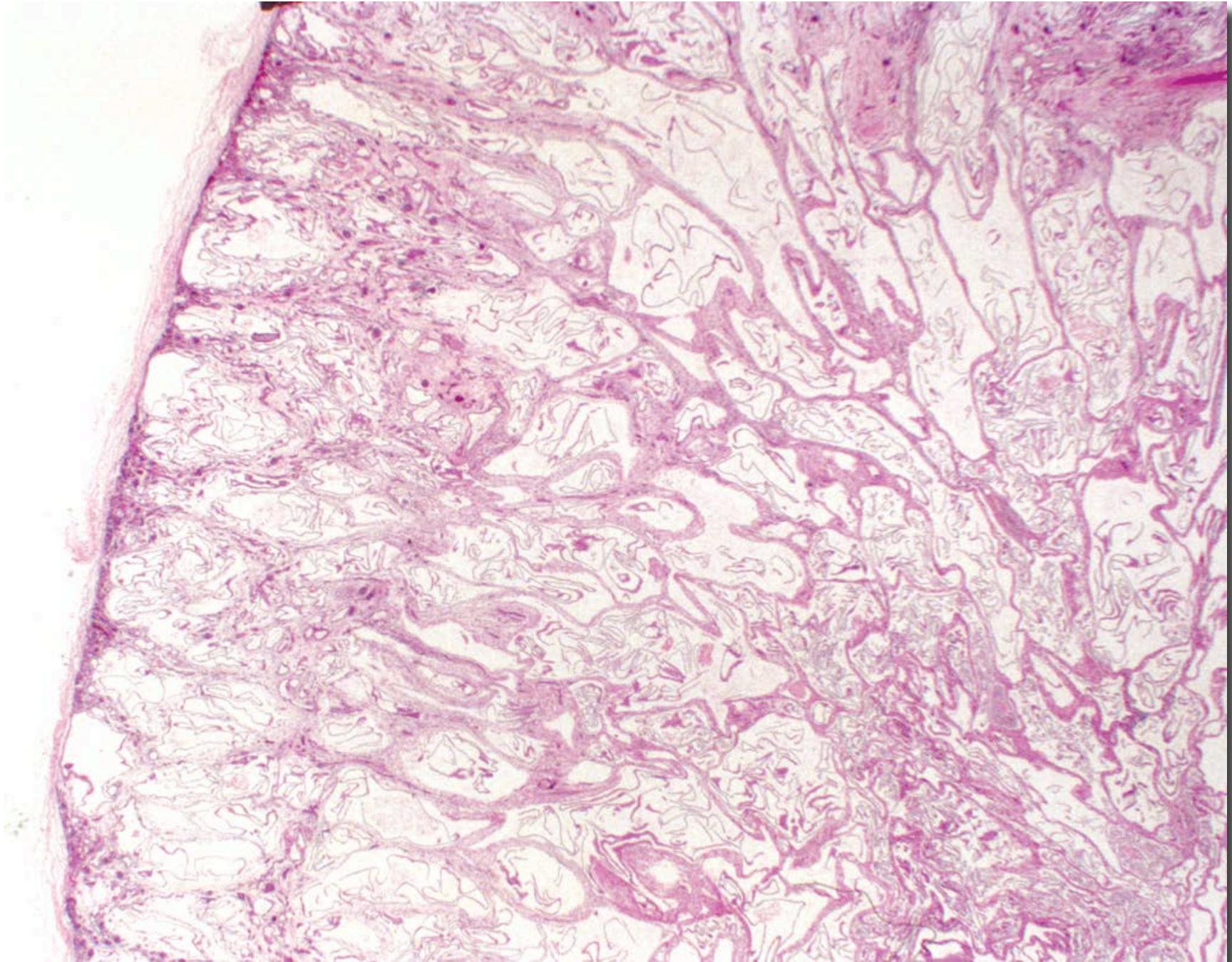
Infantile Polycystic Kidney Disease

- Least common form of polycystic kidney disease
- Autosomal recessive
- Saccular or cystic dilatations of 60-90% of collecting ducts in both kidneys
- Associated with multiple hepatic cysts and portal fibrosis
- Symptomatic in early infancy and usually fatal

Infantile Form



Childhood Polycystic Kidney Disease



Vascular Diseases

- Renal infarction
- Arteriolar nephrosclerosis
- Renal hypertension

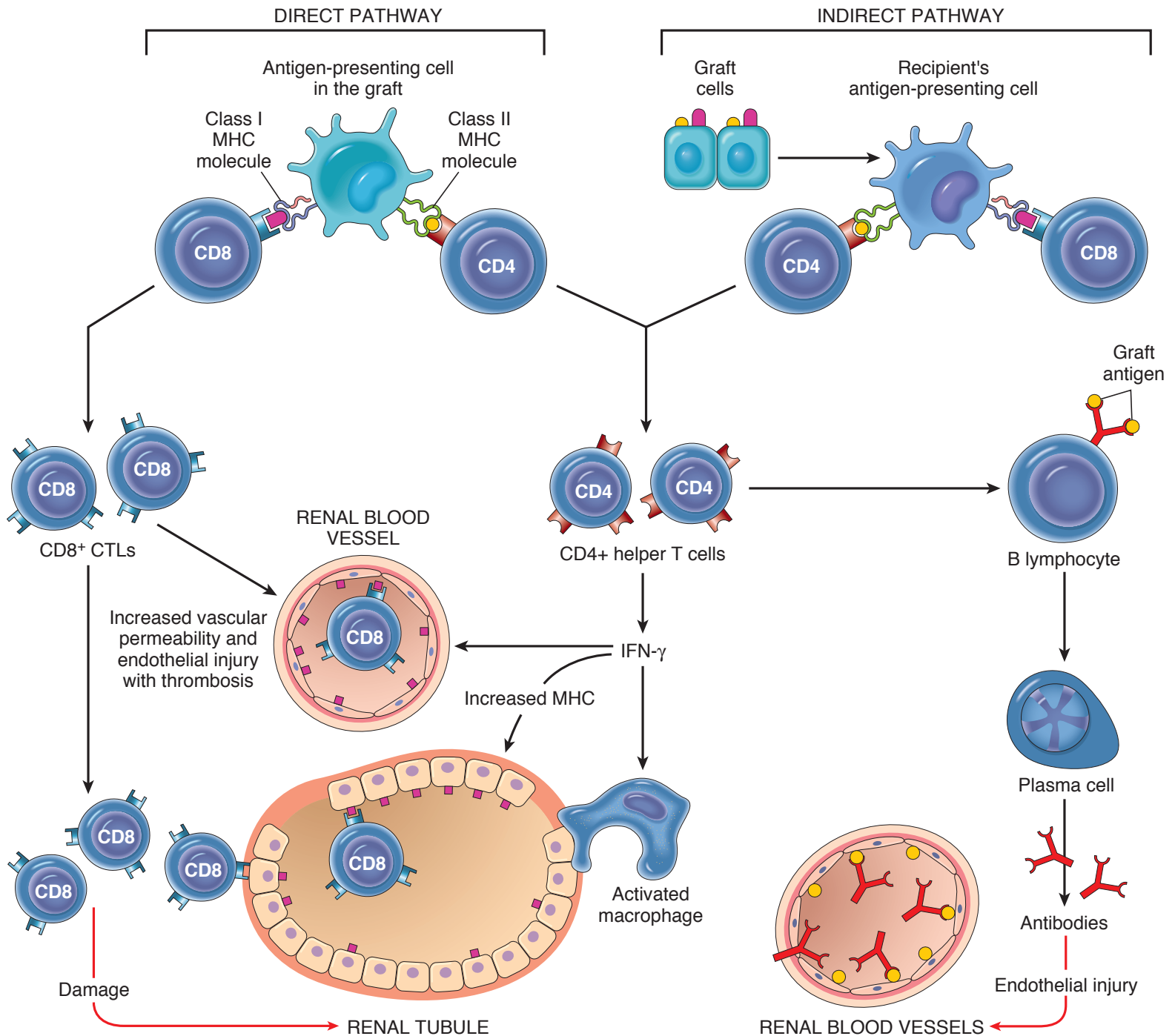
Acute Renal Infarcts



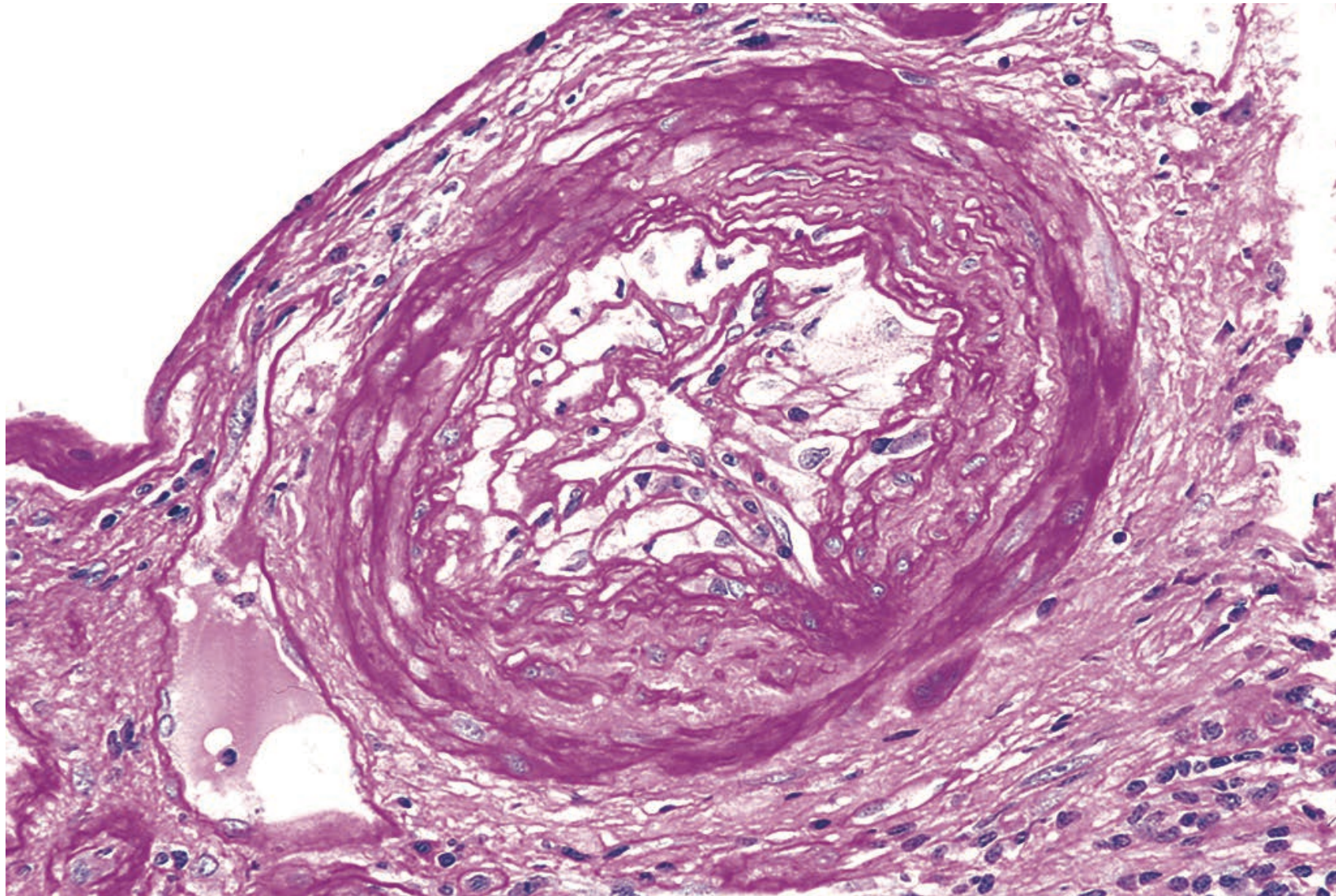
Renal Transplant Rejection

- Vasculitis
- Interstitial nephritis

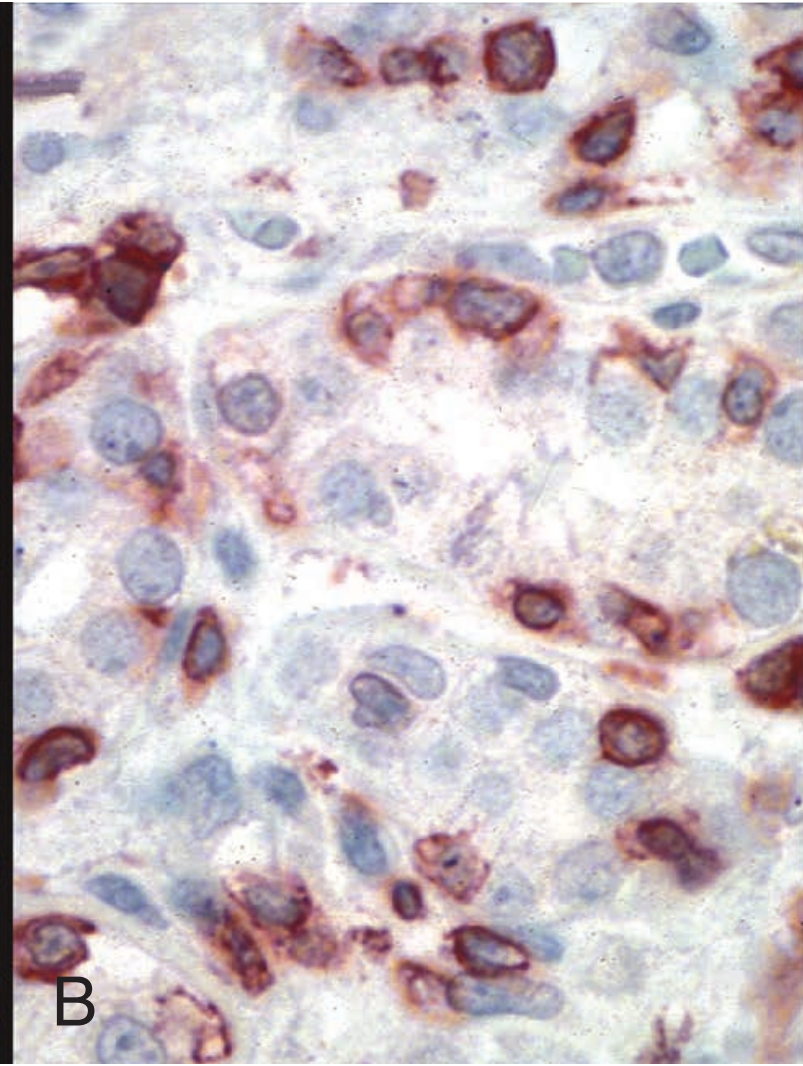
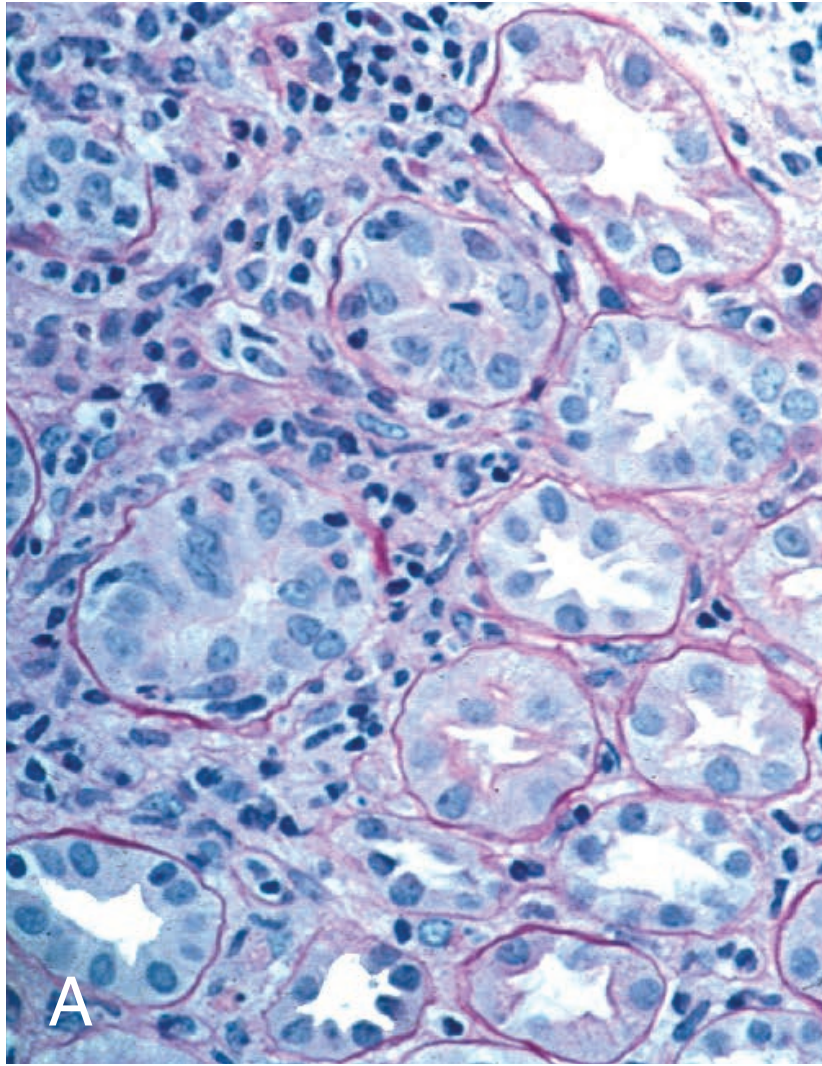
Renal Allograft Rejection



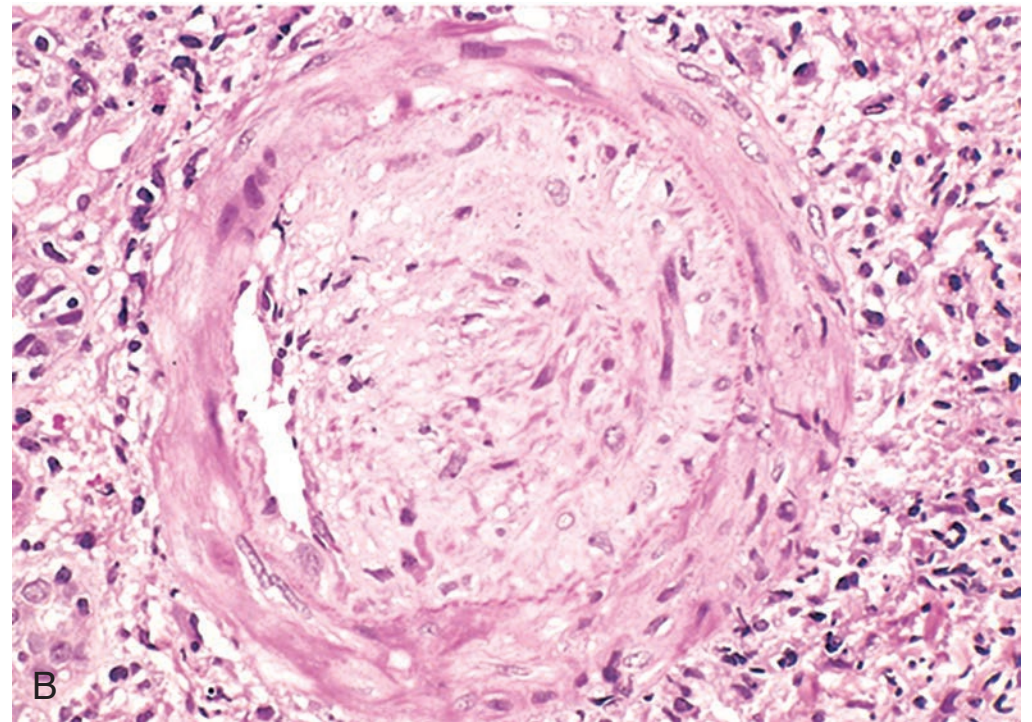
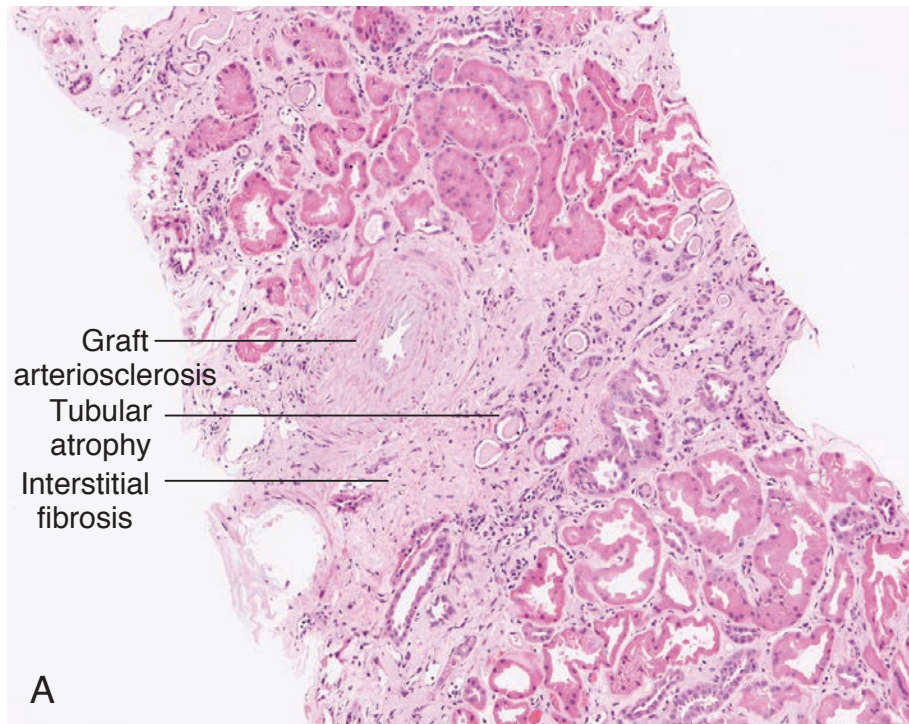
Acute Vascular Rejection



Acute Cellular Rejection



Chronic Rejection



Common Tumors of Urinary Tract

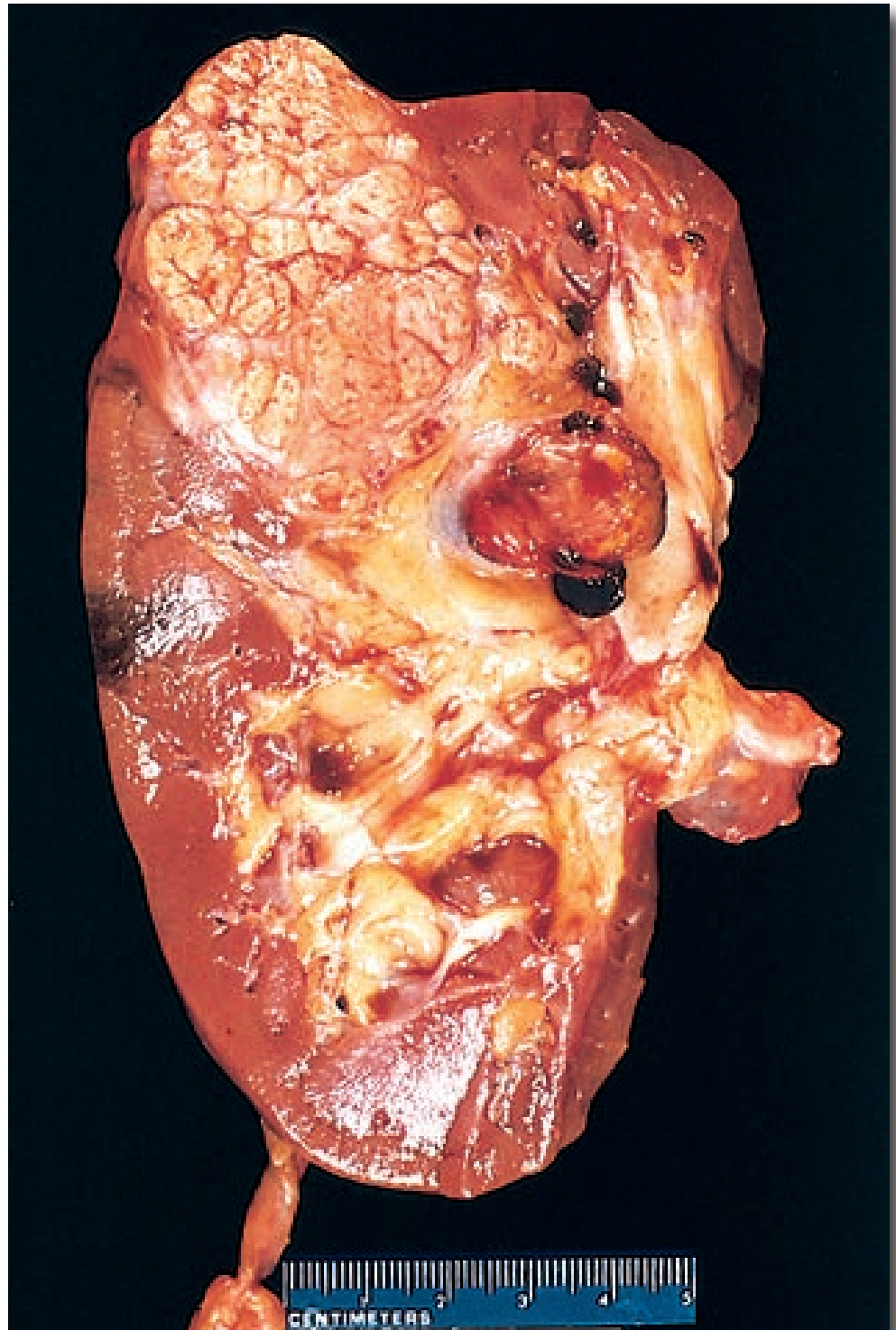
Renal Cell Carcinoma

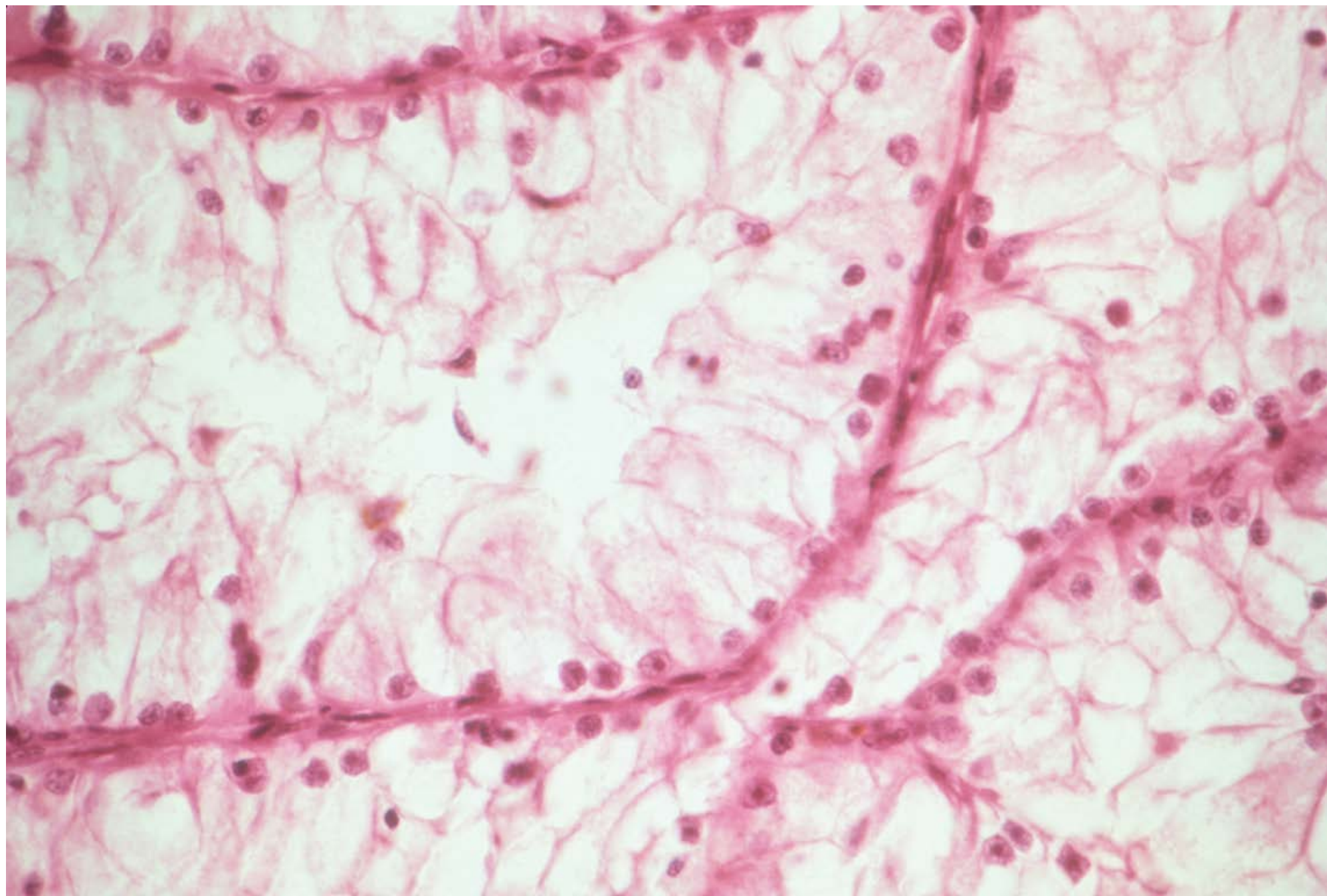
- Tumor of adults (6th-7th decade)
- More common in males
- 80-90% of renal malignant tumors
- 3% of visceral tumors
- Metastasis - often first sign due to early hematogenous spread to lungs, brain and bones
- Five-year survival - 50%

Renal Cell Carcinoma

- Variability of presenting symptoms and signs
 - Painless hematuria (most common symptom)
 - Flank pain
 - Palpable mass
 - Fever of unknown origin
 - Polycythemia
 - Cushing's syndrome

Renal Cell Carcinoma

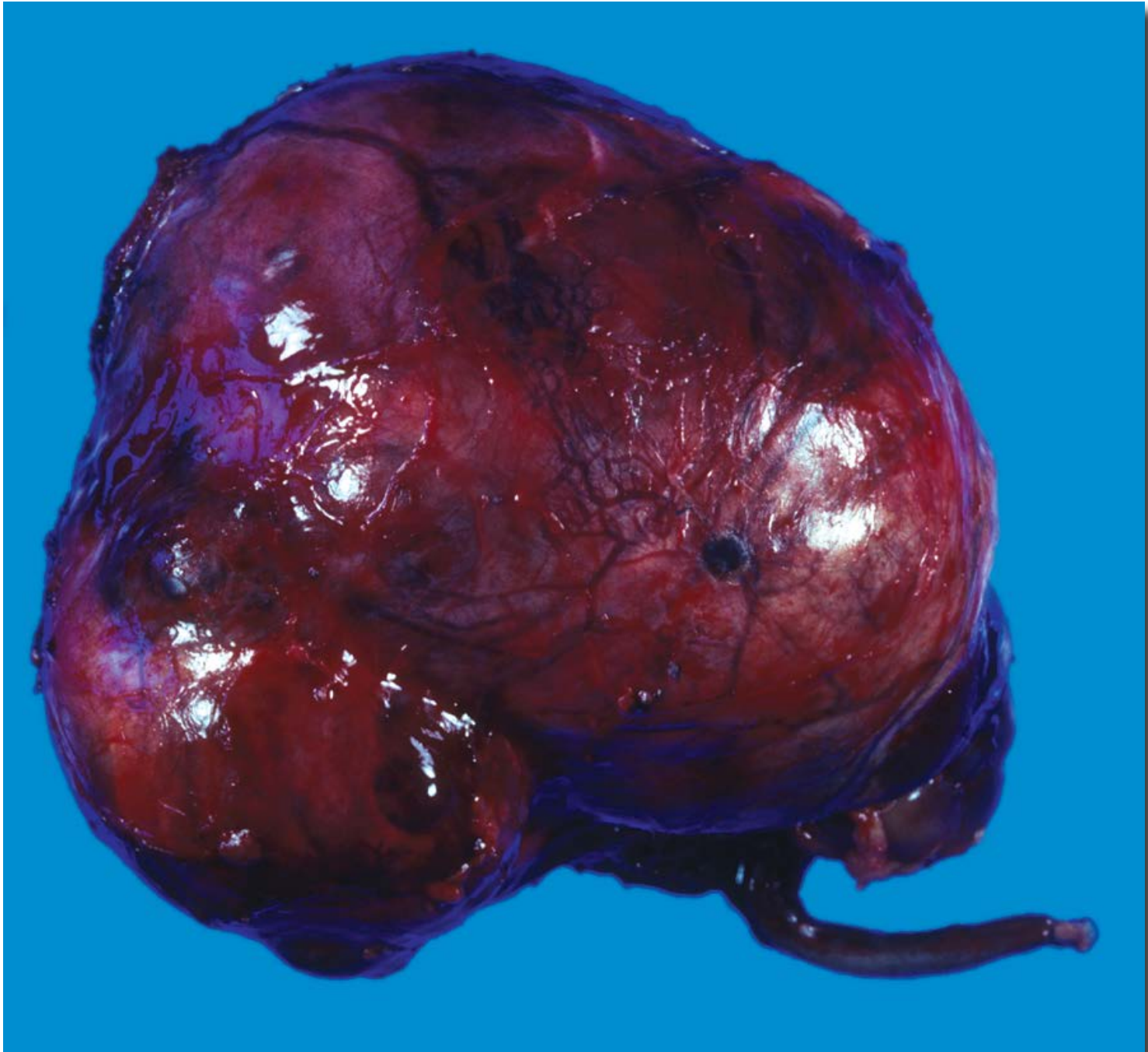




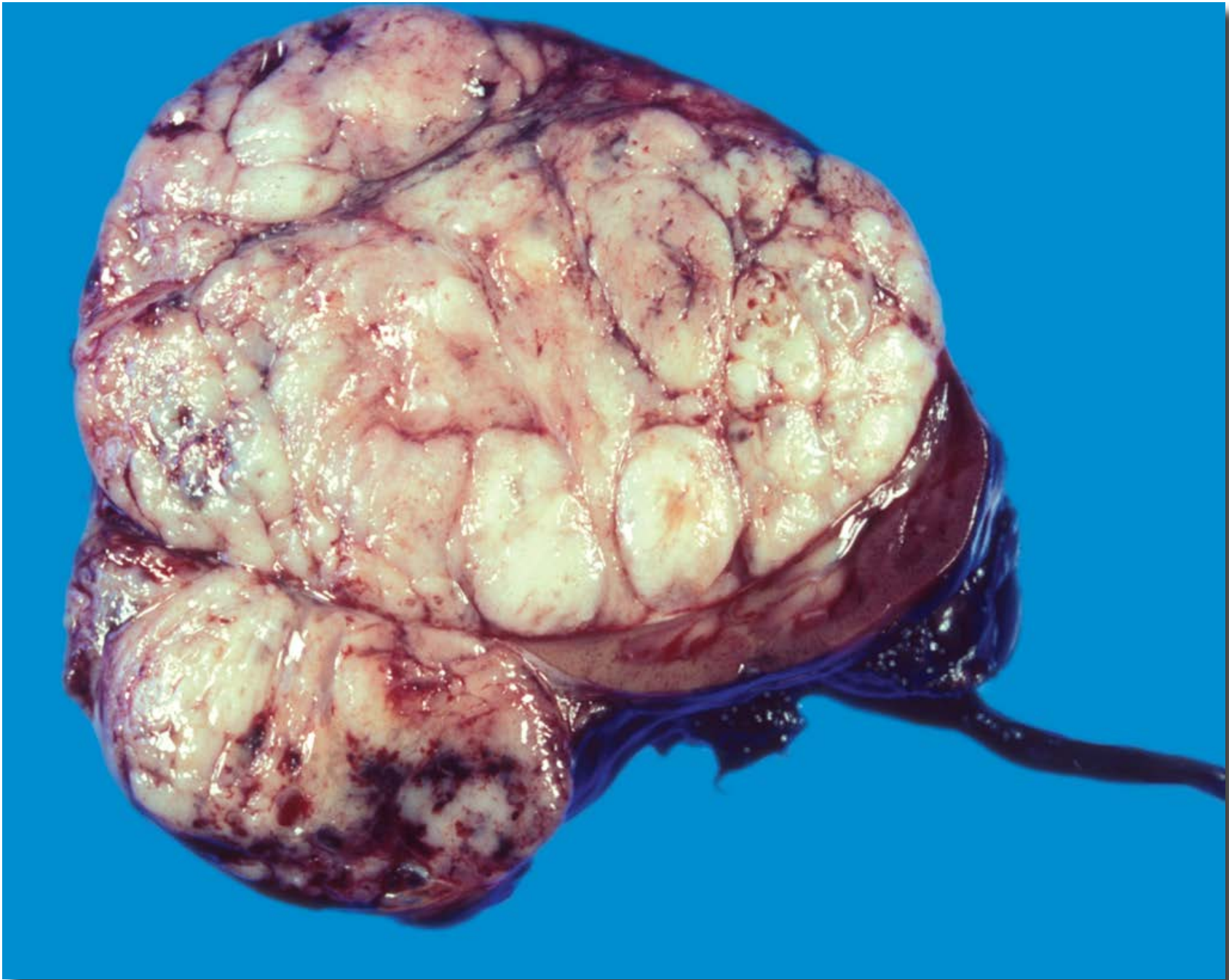
Nephroblastoma (Wilms Tumor)

- Common renal tumor of children (< 6 yrs)
- 20% of visceral childhood cancers
- May attain huge size
- Spread to other kidney and metastasize to lungs
- Signs and symptoms
 - Abdominal mass
 - Pain
 - Hematuria

Wilms' Tumor



Wilms' Tumor

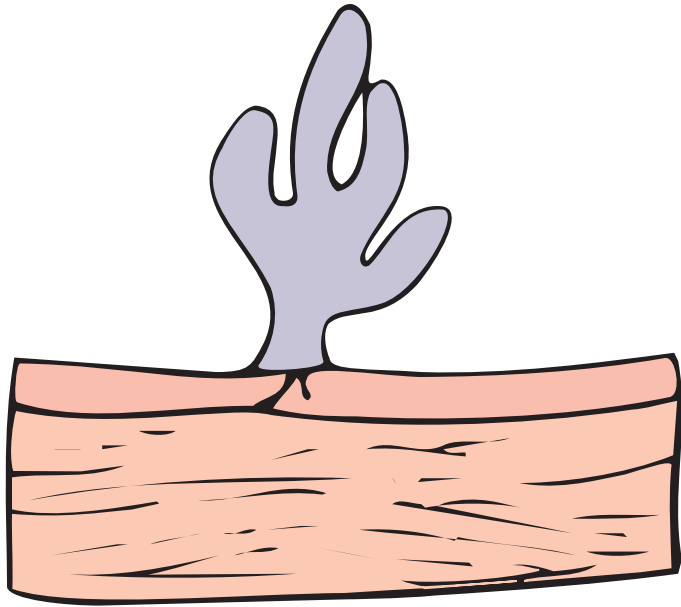


Urinary Carcinoma of Urinary Bladder

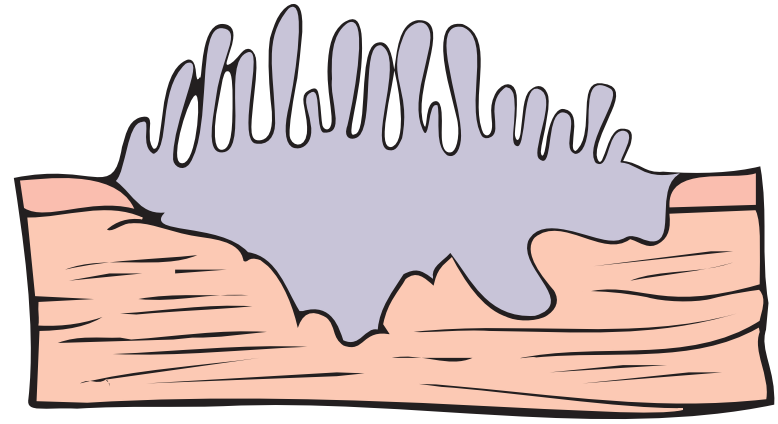
- Neoplasm of adults (5th-7th decade)
- Twice as frequent in males
- 90% originate in urinary bladder (5-10% in renal pelvis)
- Etiology - beta-naphthylamine, schistosomiasis, tobacco
- Invasion most important factor affecting prognosis
- Five-year survival: 85% (no invasion); 20% (invasion)

Urinary Carcinoma of Urinary Bladder

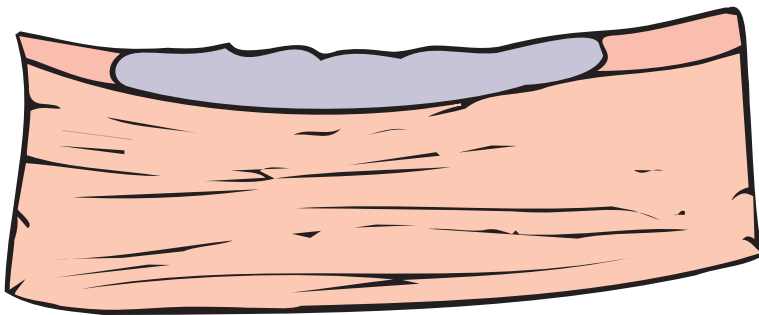
- Presenting symptoms and signs:
 - Hematuria
 - Frequency of urination
 - Dysuria (pain on urination)
- Marked tendency to recur after removal
- Metastasis via lymphatics first to external iliac nodes



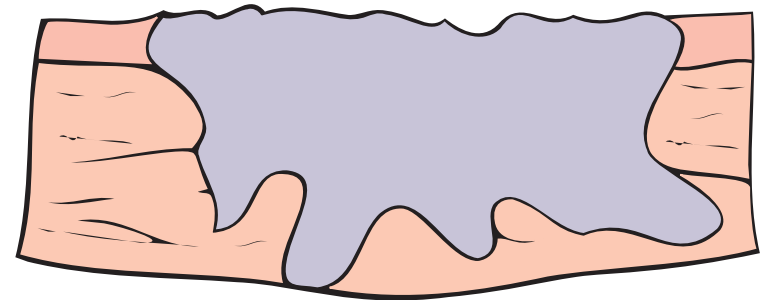
Papilloma—
papillary carcinoma



Invasive
papillary carcinoma



Flat noninvasive
carcinoma (CIS)



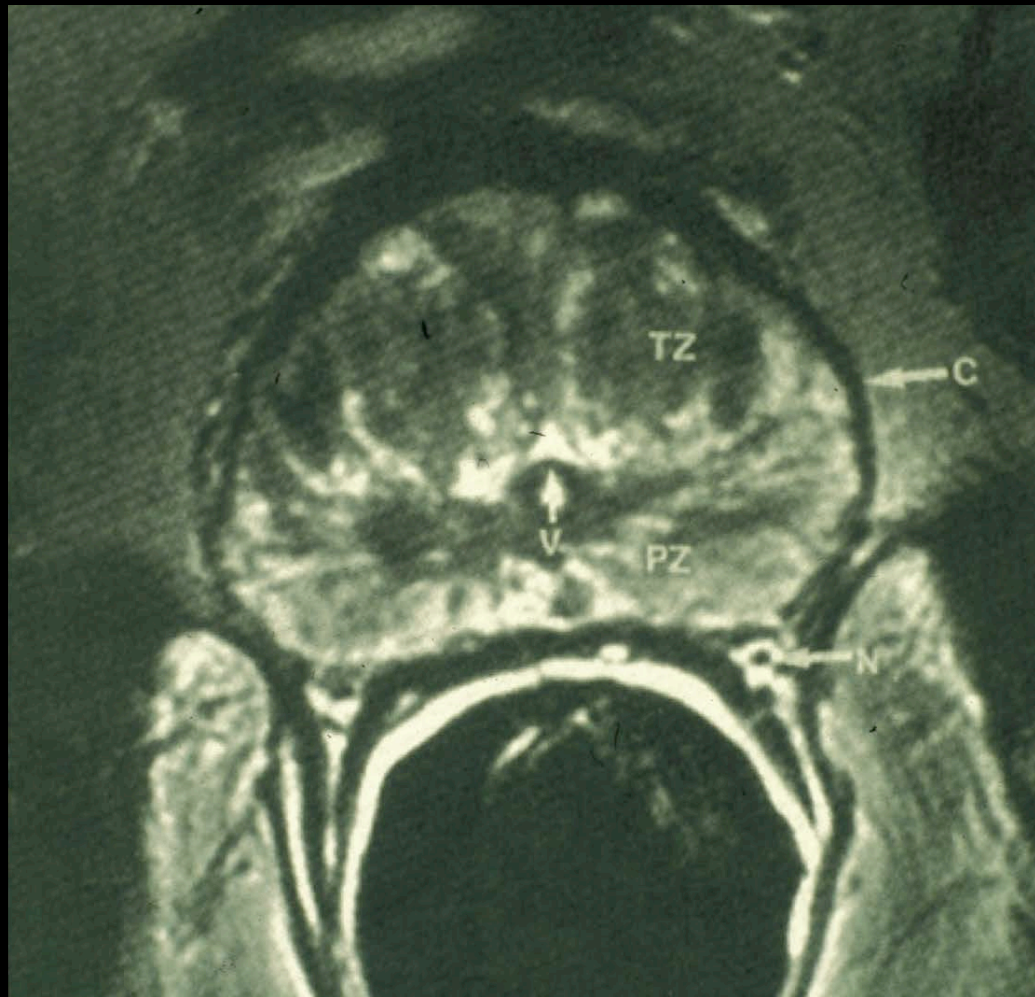
Flat invasive
carcinoma

Male Reproductive Tract

Prostatic Nodular Hyperplasia (BPH)

- Common in men over the age of 60 years
- Hyperplasia of prostatic glands and/or stromal cells (fibroblasts and smooth muscle)
- Does not increase the risk of prostatic adenocarcinoma
- Arises in the central and transitional zones
- Causes discomfort and urinary retention/obstruction

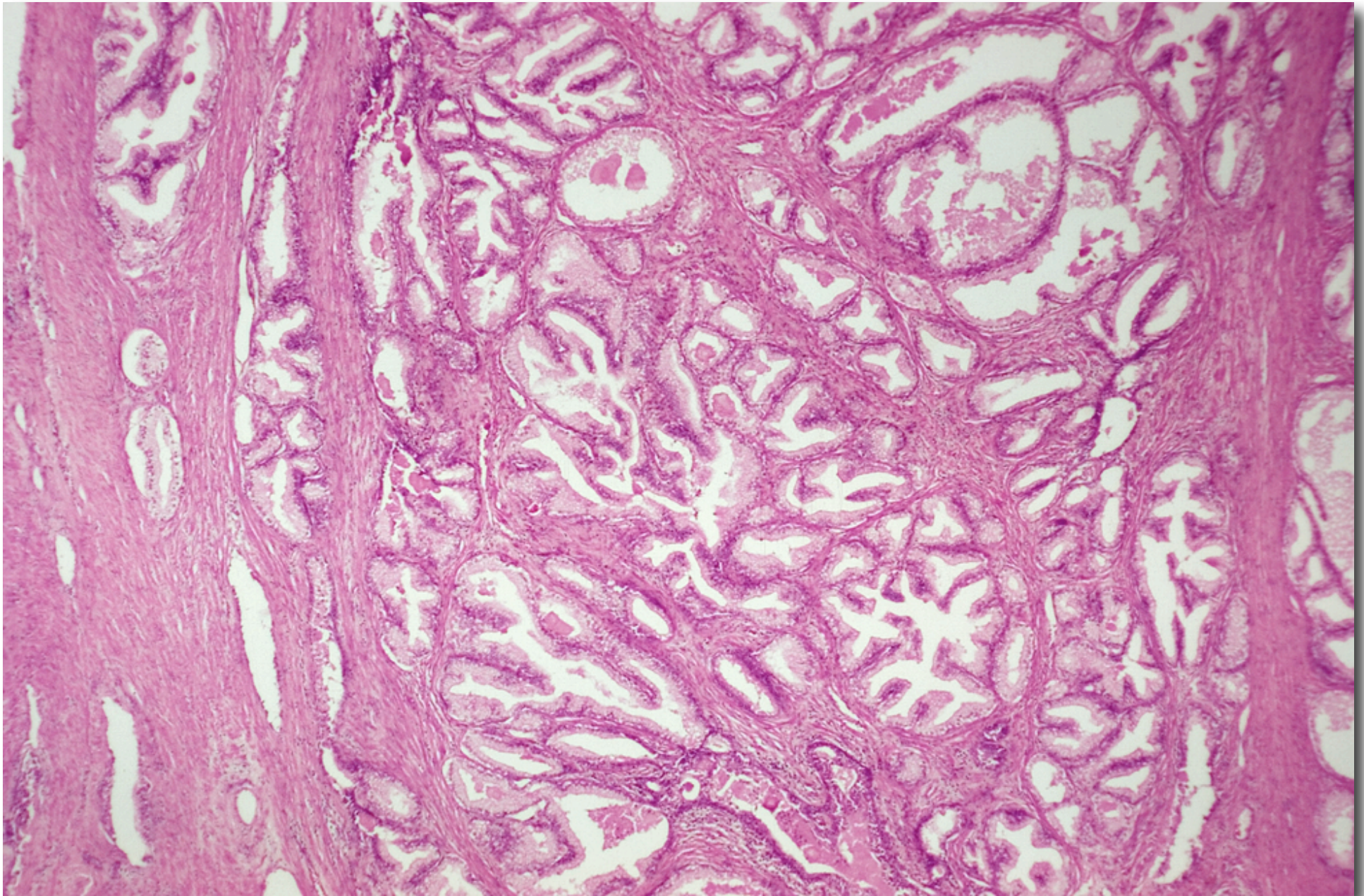
Prostatic Nodular Hyperplasia



Prostatic Nodular Hyperplasia



Prostatic Nodular Hyperplasia



Carcinoma of the Prostate

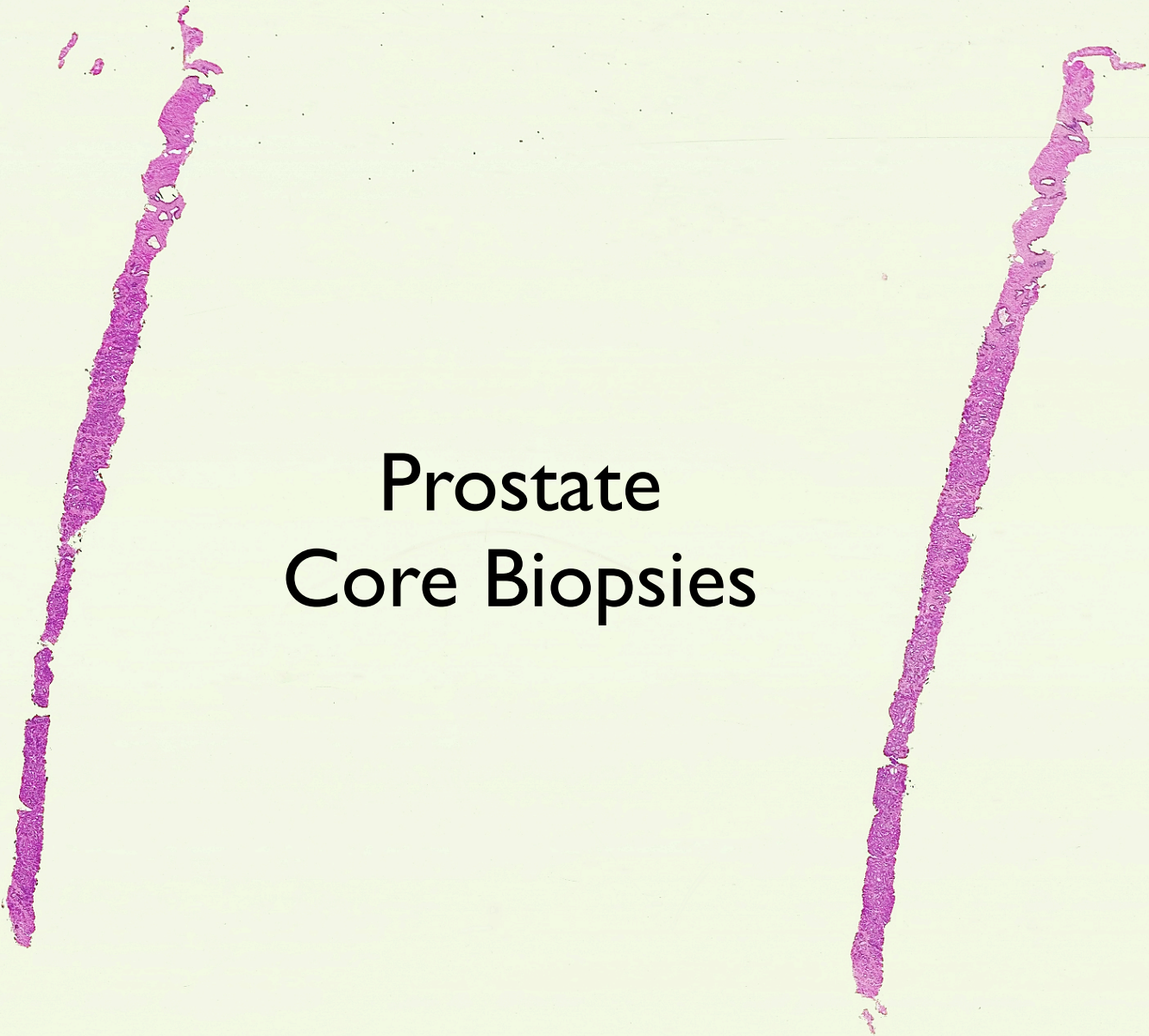
- Most common cancer in middle-age to elderly males
- Screening - elevated serum levels of prostate-specific antigen (PSA)
 - Indicates tumor size, capsular invasion and/or metastasis
- Frequent hormone (androgen) dependency
- Five-year survival approximately 35%

Carcinoma of the Prostate

- A firm tumor arising in the peripheral zone
- Not obstructive early until late stage
- Metastasis
 - Pelvic, para-aortic and mediastinal lymph nodes
 - Viscera - kidney, adrenals, liver, lungs
 - Bones in area of distribution of vertebral venous plexus - lumbar spine, femor, pelvic bones

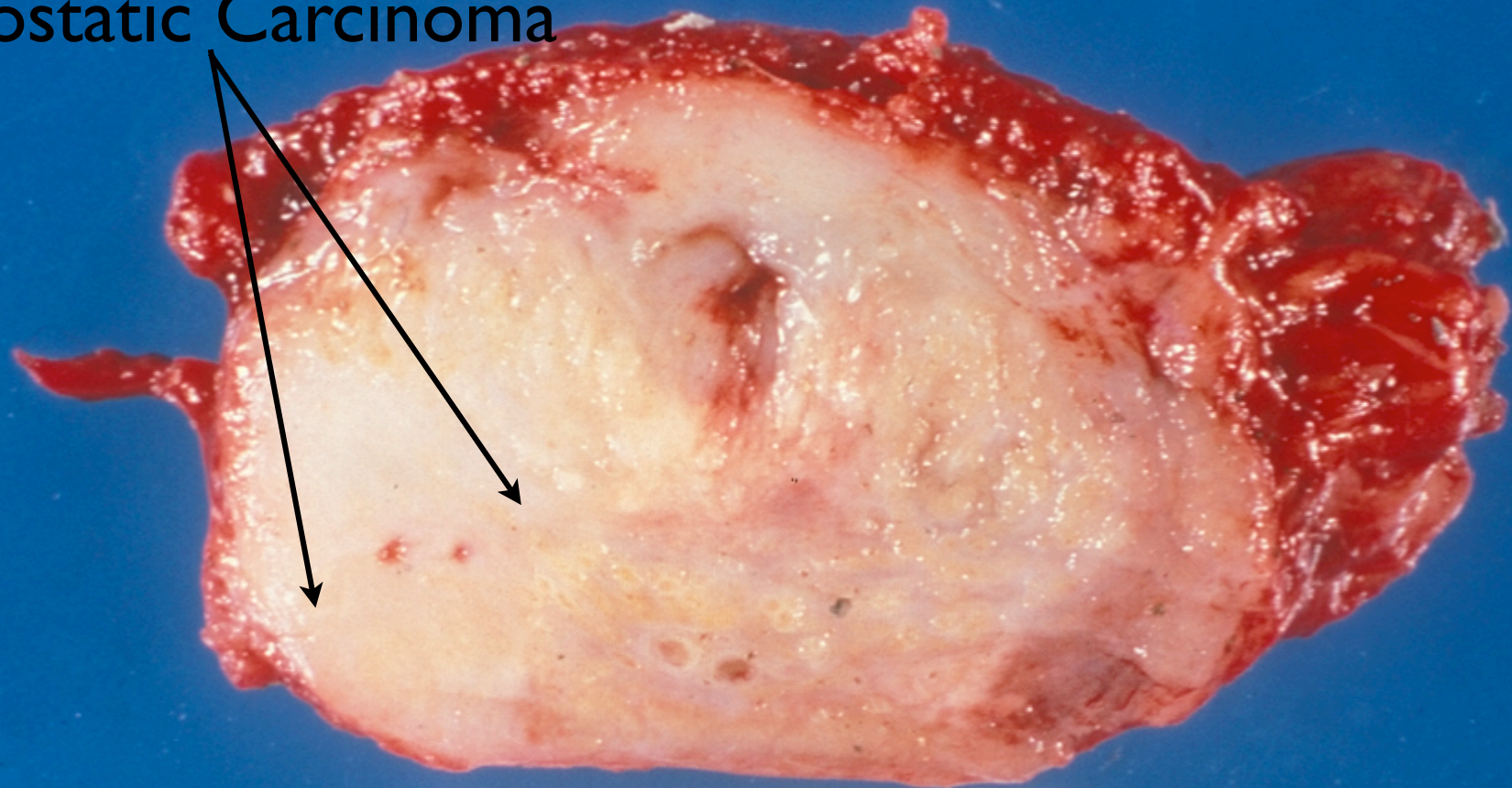
Invasive Prostatic Adenocarcinoma





Prostate Core Biopsies

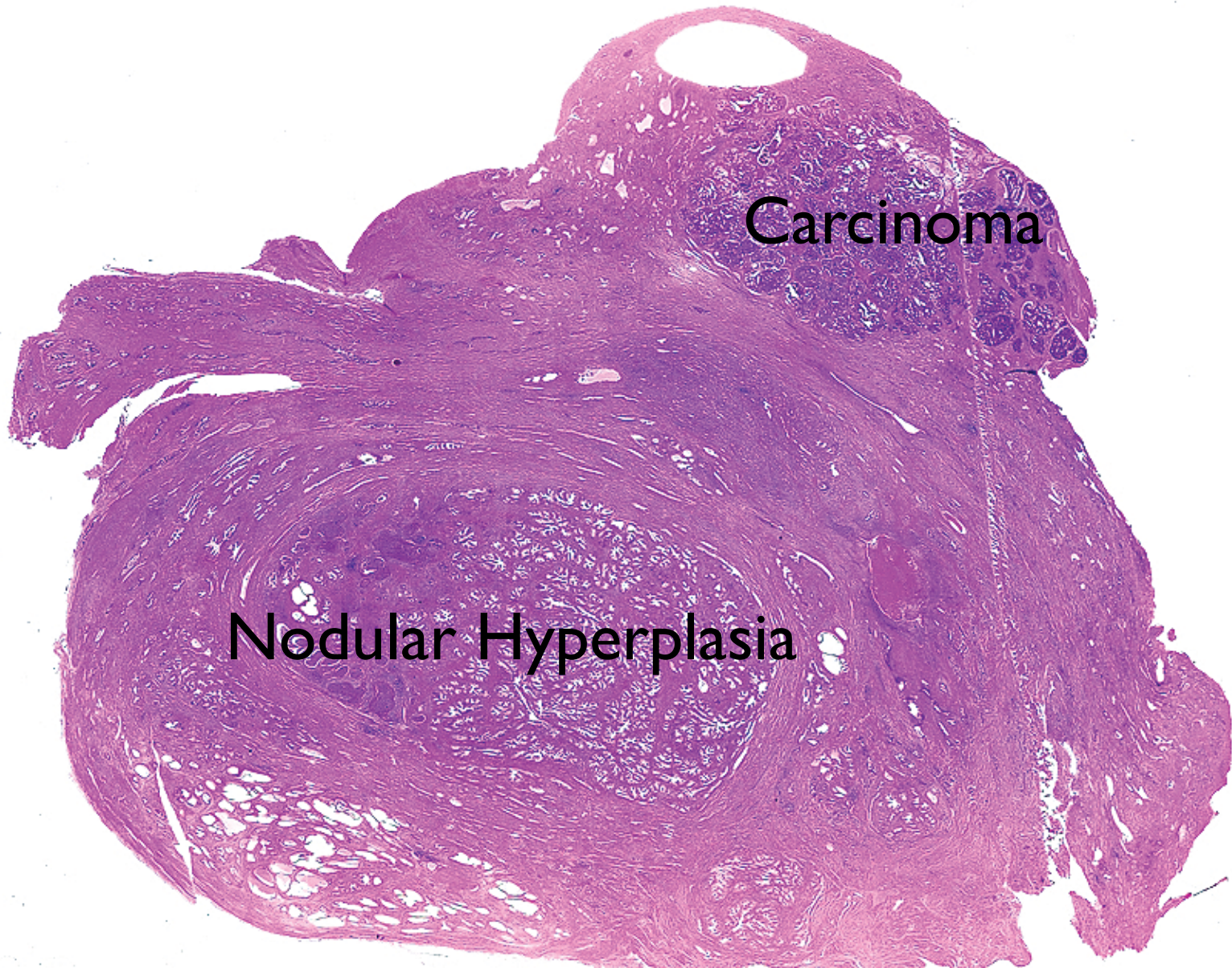
Prostatic Carcinoma



SP65-4118



Prostate

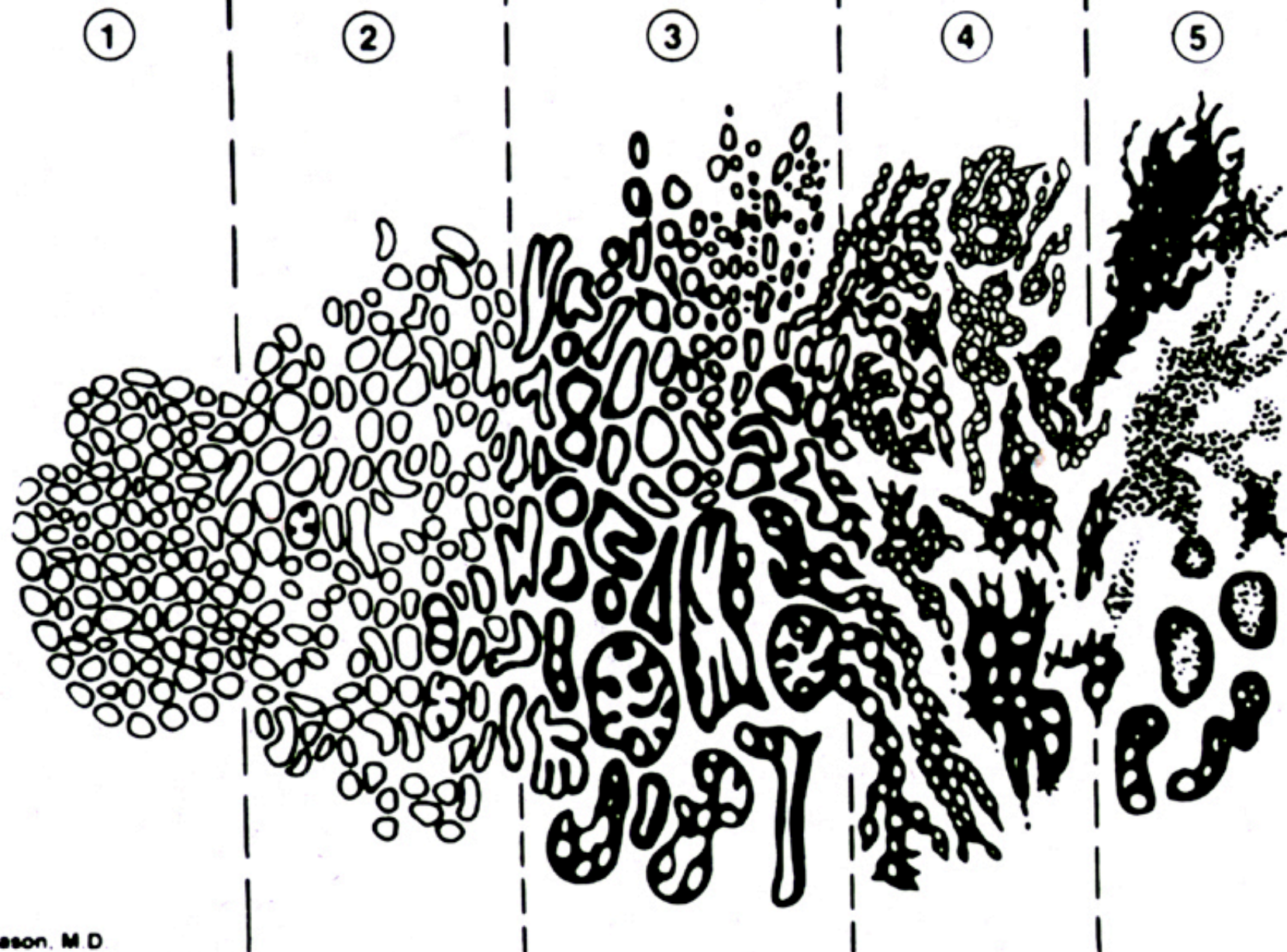


Carcinoma

Nodular Hyperplasia

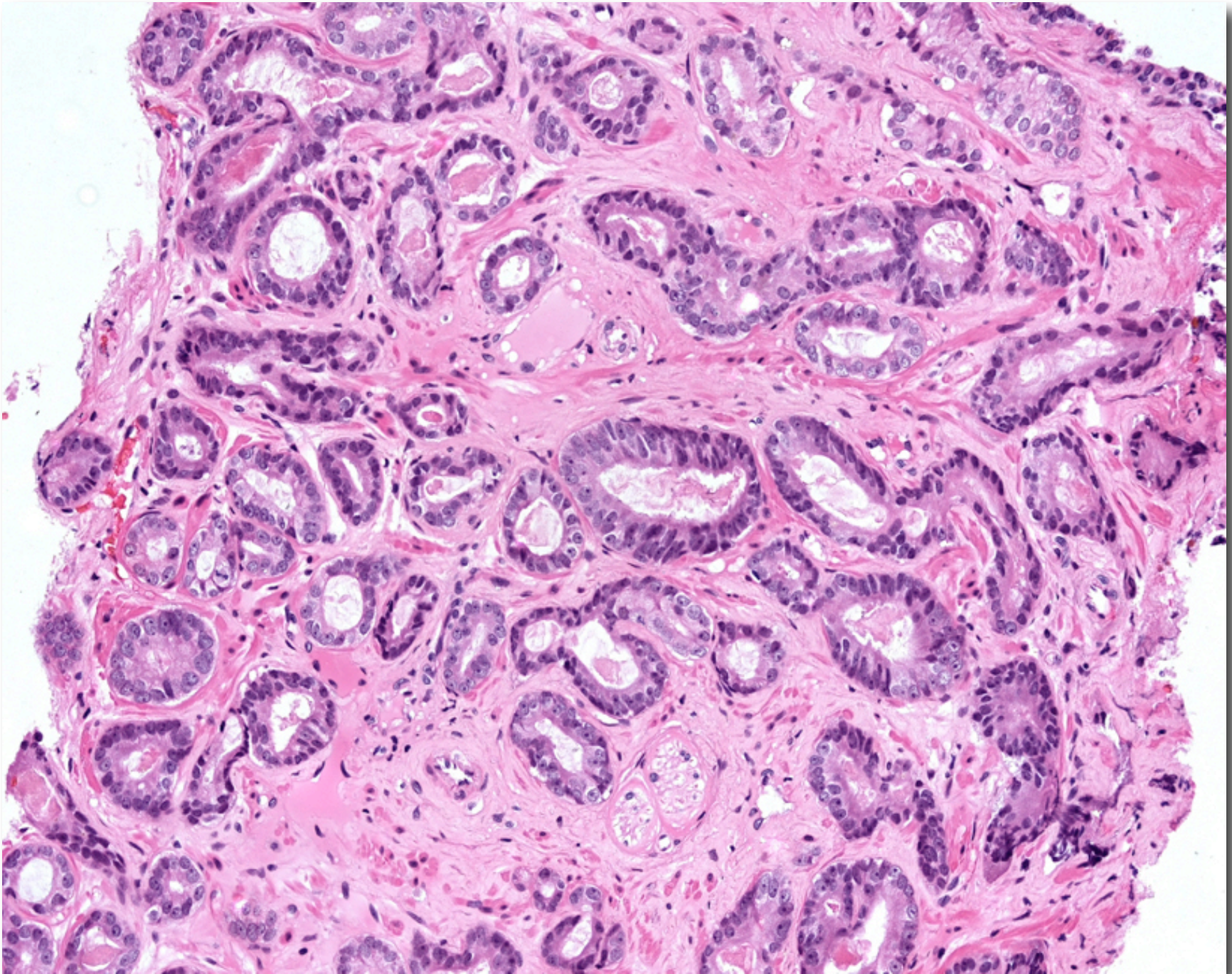
PROSTATIC ADENOCARCINOMA

HISTOLOGIC GRADES

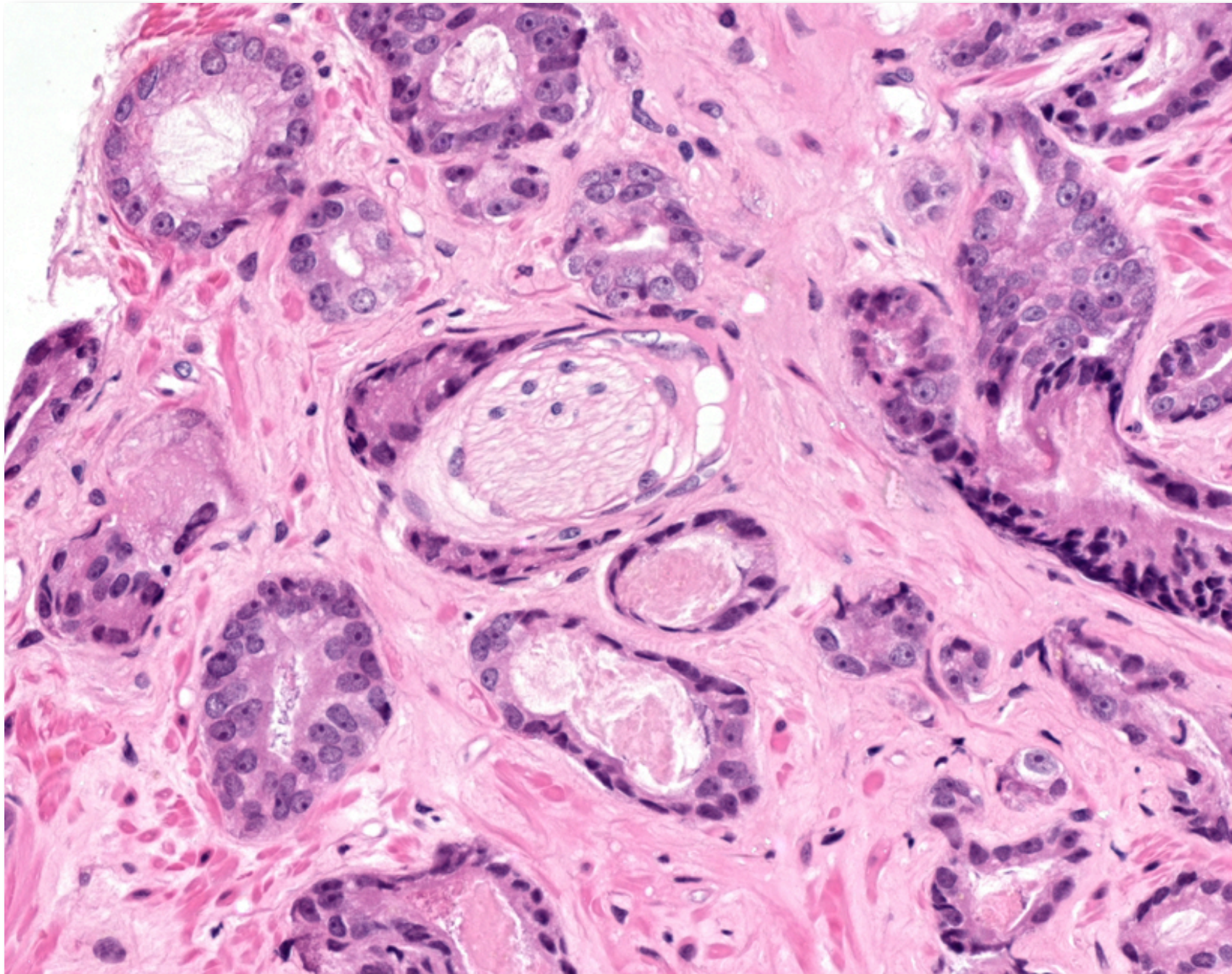


D. F. Gleason, M.D.

Prostatic Adenocarcinoma



Prostatic Adenocarcinoma



Metastatic Prostatic Adenocarcinoma



Testicular Tumors

