Achievable

USMLE STEP 1 DUMP SHEET

Renal and urinary pathology

Glomerular disease

- **Nephrotic:** proteinuria >3.5 g/day, hypoalbuminemia, edema, hyperlipidemia; clots (antithrombin III lost), infections
- **Nephritic:** hematuria (cola urine, RBC casts), hypertension, oliguria, azotemia; proteinuria under 3.5 g/day

Disease	Biopsy	Clues
Minimal change	Normal light microscopy; foot process effacement on EM	Most common in children; after a URI, NSAIDs, lymphoma; steroids work
FSGS	Segmental sclerosis; effacement	African American (APOL1), HIV, heroin, obesity, sickle cell
Membranous	Thick GBM; subepithelial spike and dome	Anti-PLA2R; SLE, HBV, HCV, cancer, NSAIDs, penicillamine
Diabetic	Mesangial expansion, Kimmelstiel-Wilson nodules	Most common nephrotic cause and ESRD cause in adults; ACE inhibitors
Poststreptococcal	Hypercellular; lumpy-bumpy IgG, C3; subepithelial humps	Weeks after strep throat or impetigo; low C3, normal C4; children recover
IgA (Berger)	Mesangial IgA deposits	Most common primary GN; gross hematuria with a URI or GI infection
Goodpasture	Linear IgG; anti-α3 type IV collagen	Hemoptysis with nephritis; HLA-DR15; plasmapheresis
Alport	Split, basket-weave GBM on EM (COL4A5, X-linked)	Hematuria, sensorineural deafness, anterior lenticonus
Lupus	Class IV diffuse proliferative, wire loops; class V membranous	Immune complexes (type III); steroids with cyclophosphamide or mycophenolate
MPGN	Tram-track GBM; type I subendothelial; type II dense deposits	Type I: HBV, HCV, cryoglobulins. Type II: C3 nephritic factor
RPGN	Crescents: parietal cells, macrophages, fibrin	Goodpasture, ANCA vasculitis (GPA), lupus, poststreptococcal

- **Low complement:** poststreptococcal, MPGN, lupus, endocarditis, cryoglobulinemia. **Normal:** IgA nephropathy, anti-GBM, ANCA vasculitis

Acute kidney injury

	Prerenal	Intrinsic
FENa	<1%	>2%
Urine Na	<20	>40
BUN:Cr	>20	<10—15
Urine osm	>500	<350

- **Postrenal:** looks prerenal early, intrinsic after a few days
- **Casts:** hyaline (prerenal), muddy brown (ATN), WBC and eosinophils (interstitial nephritis), RBC (GN)
- **ATN:** ischemia, aminoglycosides, contrast, myoglobin, ethylene glycol; polyuric recovery
- **Interstitial nephritis:** NSAIDs, β-lactams, rifampin; fever, rash, eosinophiluria
- **Papillary necrosis:** diabetes, analgesics, sickle cell, pyelonephritis
- **Dialysis for:** refractory hyperkalemia, acidosis or fluid overload; uremic pericarditis or encephalopathy; lithium, ethylene glycol

Stones

- **Calcium oxalate:** most common; acid urine; hypercalciuria, low-calcium diet, vitamin C
- **Struvite:** staghorn; *Proteus* infection; alkaline urine
- **Uric acid:** radiolucent; acid urine; gout, chemotherapy
- **Cystine:** cystinuria; acid urine
- **Workup:** noncontrast CT; stones under 5 mm usually pass
- **Prevention:** fluids; thiazides cut urine calcium; citrate

Vessels and CKD

- **Renal artery stenosis:** atherosclerosis; fibromuscular dysplasia in young women (string of beads); no ACE inhibitor if bilateral
- **Renal vein thrombosis:** nephrotic syndrome; left side → varicocele
- **CKD:** eGFR <60 for >3 months; anemia, secondary hyperparathyroidism

Cysts and tumors

- **ADPKD:** PKD1 (16p), PKD2 (4q); berry aneurysms, liver cysts, hypertension
- **ARPKD:** PKHD1; infants; congenital hepatic fibrosis, oligohydramnios
- **RCC:** clear cells; VHL → HIF; smoking; renal vein invasion; EPO, PTHrP, renin
- **Wilms:** under 5; WT1 (11p); WAGR, Beckwith-Wiedemann; triphasic
- **Bladder:** urothelial; smoking, aniline dyes; painless hematuria. Squamous with *Schistosoma haematobium*

Lower tract

- **UTI:** *E. coli* (P fimbriae); pyelonephritis: fever, flank pain
- **Reflux:** children, recurrent UTI, scarring; VCUG
- **Posterior urethral valves:** male infants
- **Neonatal hydronephrosis:** most often ureteropelvic junction obstruction
- **Urethral injury:** blood at the meatus; retrograde urethrogram, no catheter