

Glomerular Disease

NEPHRITIC SYNDROME → A disorder of glomerular inflammation, also called glomerulonephritis.

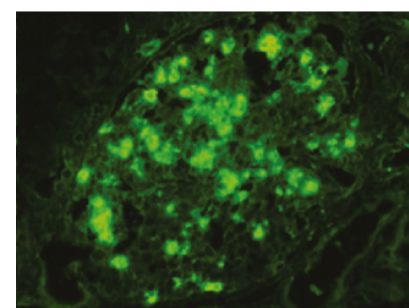
History/PE → The classic findings are macroscopic/microscopic hematuria (tea- or cola-colored urine), hypertension, and edema (can also present with pulmonary edema).

Diagnosis →

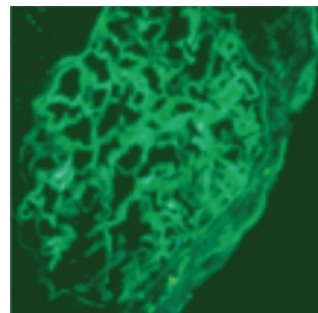
- Urinalysis (UA) shows hematuria and variable degrees of proteinuria.
- In most severe cases, patients may have a ↓ GFR with elevated BUN and creatinine.
- Renal biopsy may be needed for histologic evaluation and treatment and prognosis considerations.

Treatment →

- If present, treat hypertension, fluid overload, with salt restriction, RAAS blockade, +/- diuretics.



Lumpy-bumpy" immunofluorescence found in postinfectious glomerulonephritis.



Linear immunofluorescence seen in Goodpasture syndrome.

NEPHROTIC SYNDROME

- Hyperproteinuria (≥ 3.5 g/day).
- Hypoproteinemia/Hypoalbuminemia—albumin levels fall caused by protein loss.
- Hyperlipidemia (accelerated atherosclerosis).
- Edema (morning periorbital edema).

History/PE

patients will notice they have foamy urine

dyspnea and ascites and other complications from anasarca may develop.

Patients have ↑ susceptibility to infection and hypercoagulable states with an ↑ risk for venous thrombosis and pulmonary embolism (caused by loss of antithrombin 3, increased platelet aggregation, and changes in protein C and S levels). Commonly manifests as renal vein thrombosis.

Diagnosis

- UA shows proteinuria (≥ 3.5 g/day) and lipiduria (Maltese crosses signifying lipids on microscopic urine exam).
- Blood chemistry shows ↓ albumin (< 3 g/dL) and hyperlipidemia.

Treatment

- Treat with salt restriction and judicious diuretic therapy.
- If hypertensive, can use RAAS blockade and/or diuretic therapy.
- If nephrotic syndrome is chronic, may need to treat with statins.
- ACEIs ↓ proteinuria and diminish the progression of renal disease in patients with renal scarring (especially in patients with diabetes).

Acute Kidney Injury

	Prerenal azotemia	Intrinsic renal failure	Postrenal azotemia
	Hypovolemia cardiac output effective circulating volume (HF, liver failure)	Tubules and interstitium: Acute tubular necrosis (ischemia, nephrotoxins) Acute interstitial nephritis Glomerulus: Acute glomerulonephritis Vascular: Vasculitis Malignant hypertension TTP-HUS	Stones BPH Neoplasm Congenital anomalies
PATHOPHYSIOLOGY	low RBF low GFR increase reabsorption of Na ⁺ /H ₂ O and urea	In ATN, patchy necrosis debris obstructing tubules and fluid backflow low GFR	Outflow obstruction (bilateral)
URINE OSMOLALITY (mOsm/kg)	>500	<350	Varies

**Indications for urgent dialysis—
AEIOU**



Acidosis
Electrolyte abnormalities (hyperkalemia)
Ingestions (salicylates, theophylline, methanol, barbiturates, lithium, ethylene glycol)
Overload (fluid)
Uremic symptoms (pericarditis, encephalopathy, bleeding, nausea, pruritus, myoclonus)
