

# GUIDE TO ACUTE KIDNEY INJURY

## KDIGO AKI Definition (modification of the RIFLE and AKIN Criteria)

- ↑ in serum Cr  $\geq 0.3$  mg/dL within 48 hours or...
- ↑ in serum Cr to  $\geq 1.5x$  baseline serum Cr over 7 days or...
- UOP  $< 0.5$  mL/kg/h for 6 hrs

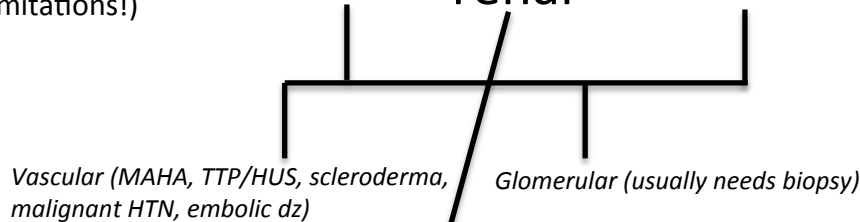
## What to ask/look for:

- HPI, PMH, full ROS
- Nephrotoxins (NSAIDs, contrast, OTCs, herbals, abx, illicit, chemo, immunosuppression)
- Hx of AKI/CKD
- Recent hypo/hypertension?
- TTE/liver fxn?
- BMP, Ca/P, CBC w/ diff
- Urinalysis/microscopy/UOP/weights
- Urine Na/K/Cl/urea/protein/Cr
- Renal/bladder US w/ PVR
- CPK, uric acid (rhabdo/TLS)

## pre-renal

- FeNa typically  $< 1\%$  (has limitations!)
- Hypovolemia
- Hypotension
- Congestive heart failure
- Cirrhosis
- Nephrotic syndrome

## renal



## post-renal

- Malpositioned foley catheter
- Neurogenic bladder
- Medication related urinary retention
- Nephrolithiasis (usually BL, but can be one sided if pre-existing CKD/1 kidney)
- BPH
- Retroperitoneal fibrosis
- Malignancy/ureteral obstruction

Urine sediment should be active! (WBCs/RBCs/casts/protein)

**CASTS:** Cylindrical structures formed in distal convoluted tubule/collecting ducts via precipitation of *Tamm-Horsfall mucoprotein* (secreted by renal tubule cells) or albumin (if proteinuria)

- WBC – AIN, pyelonephritis, glomerulonephritis
- RBC – glomerulonephritis, sometimes AIN
- Granular – ATN (degenerated cellular casts, aggregation of protein in cast)
- Waxy – CKD/AKI, sharp indentations on edges, nonspecific
- Hyaline – empty appearing, nonspecific
- Fatty – lipid droplets within casts
- Pigment – hemolysis/rhabdomyolysis
- Broad – large dilated tubules, advanced CKD

## Causes of Inpatient AKI (Liano 1996)

- ATN – 45%
- Pre-renal disease – 21%
- AKI on CKD – 13% (mostly ATN and pre-renal)
- Urinary tract obstruction – 10% (most often prostate related)
- Glomerulonephritis or vasculitis – 4%
- AIN – 2%
- Atheroemboli – 1%