Acute renal failure

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Acute renal failure

- ↓ in renal functioning
- ↓ in glomerular filtering of urine production
- ↓ in excretion
- Abnormal ↑ BUN & creatinine

Acute renal failure

- Prerenal
- Intrarenal
- Post renal

Acute renal failure

- **Prerenal**
  - Hypovolemia
  - Sepsis
  - Renal artery stenosis
  - Drug toxicity

Acute renal failure

- **Intrarenal**
  - Acute tubular necrosis
  - Glomerular disease
  - Renal vascular disease

Acute renal failure

- **Post-renal**
  - Obstruction of renal calyces, ureters, or bladder
    - Stones
    - Tumor
    - Adhesions

Acute renal failure

- **Clinical features**
  - Asymptomatic
  - Anorexia
  - Nausea
  - Oliguria
  - Gross hematuria
  - Flank pain

Acute renal failure

- **Clinical features**
  - Mental status changes
  - Pericardial friction rub
  - Hypertension
  - Fever
  - Diffuse rash
  - edema

Acute renal failure

- Labs
  - Azotemia
    - ↑BUN
    - ↑Cr
  - Urinalysis
    - Hematuria
    - Red cell casts
    - Epithelial casts

Acute renal failure

- Labs
  - FENa < 1%
    - Prerenal
  - FENa >2%
    - Intrinsic renal
    - Postrenal

$$\text{FENa} = \frac{(\text{urine } Na^+/\text{serum } Na^+)}{(\text{urine Cr/serum Cr})}$$

Acute renal failure

- BUN:Creatinine
  - Ratio >20
    - Prerenal
- Radiology
  - US
  - CT
  - IVP
  - Renal angiography
    - Mass, hydronephrosis, obstruction, vasculitis

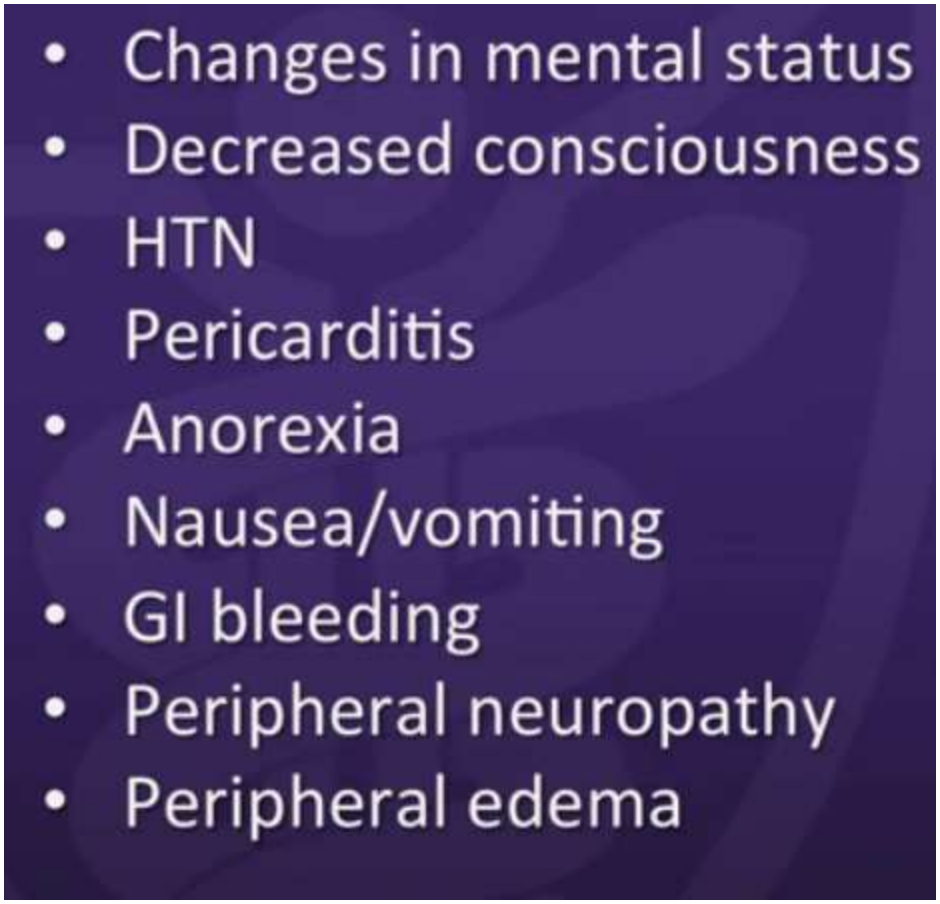
Chronic kidney disease

Chronic kidney disease

- Progressive damage of the renal parenchyma
- Several years to develop
- HTN
- Diabetes

Chronic kidney disease

- Clinical features



Chronic kidney disease

Labs

- Hyperkalemia
- Hyponatremia
- ↑ PO_4^{3-}
- ↓ Ca^{2+}
- Anemia
- Metabolic acidosis

Chronic kidney disease

Labs

- ↑BUN and Cr
- Urine osmolality similar to serum osmolality
- Urine microalbumin
- 24-hour urine protein

Chronic kidney disease

Ultrasound

- Hydronephrosis
- Shrunken kidneys

Chronic kidney disease

Treatment for chronic kidney disease:

- Stop smoking!
- Aggressive BP control
  - Diuretic (loop)
  - ACE-I or ARB
  - β-blockers: to reduce CAD risk
  - Dihydropyridine CCB
- DM aggressive control to HgbA1C goal of < 6.5% with insulin and oral agents (usually not metformin)
- Aggressive lipid control with statins
- Aggressive treatment of anemia to goal Hgb 11-12
  - Usually requires iron and erythropoietin
- Vitamin D replacement
- Phosphate binders (Phos-Lo)
- Daily ASA 81mg to reduce endothelial injury CAD risk

Chronic kidney disease

- End-stage renal disease
- Electrolyte problems
- Renal osteodystrophy
- Encephalopathy

Chronic kidney disease

- Hemodialysis
- Peritoneal dialysis

Chronic kidney disease

- Indication for dialysis