Treatment of Intrarenal ARF

- Prerenal and Postrenal causes of ARF must first be ruled out or treated.
- All nephrotoxic medications must be discontinued.
- The treatment goals are prevention, avoidance of further kidney injury, treatment of underlying condition, aggressive treatment of complications.

Oliguria vs Nonoliguria:
Oliguric renal failure carries a higher mortality.
Diuretic challenge is used to convert oliguria to nonoliguria by preventing glomeruli obstruction with tubules and casts.
Diuretics are not given until hypovolemia has been treated and cardiovascular function optimized. But overly aggressive fluid resuscitation is avoided (it leads to edema, ARDS).
Furosemide bolus, 100-200 mg IV given very slowly. If the pt. is unresponsive to diuretic, diuretic is discontinued.
Studies have found that patients with contrast nephropathy who are treated with furosemide have a worse outcome.
Mannitol is an option, but risks fluid overload and ↑ K.
Low-dose Dopamine does not improve renal blood flow.

Early dialysis:
Patients who start dialysis when BUN = 40 mg/dL have a better survival rate compared to patients who do not start dialysis until BUN = 95 mg/dL.

Electrolyte & Acid-Base Imbalances:

Na is ↓:	Is usually due to hemodilution. Fluid restrict to replace renal and extrarenal losses.
K is ↑ (5.5-6.5):	Restrict dietary K to < 50 mEq/day. Kaexylate 25 g + 70 % Sorbitol 15 mL q 3 - 6 h. Kaexylate oral is preferable (longer contact with GI tract for K exchange to occur). Beware, for each 1 mEq K removed, 1 mEq of sodium is retained. Sorbitol is given to prevent constipation.
K is ↑↑ (> 6.5):	Calcium (for cardioprotection) given as 10 mL of 10 % Calcium Gluconate for 1 - 3 doses. Glucose and Insulin given as: 1 - 2 amps $D_{50}W$ and 5 - 10 U regular insulin IV Effect occurs within 30 minutes. Beware, these measures move K into cells, and do not remove K from the body. As effects dissipate, expect plasma K to rise again.
Ca is ↓:	IV Calcium may be needed.
Phos is ↑:	Restrict phosphate intake, give phosphate-binders
pH is ↓:	Dialysis (rarely bicarbonate) if HCO_3 < 15 mEq/L.

Pulmonary:
Hypoxia is common during dialysis, probably due to alveolar hypoventilation and to WBC sequestration in the lungs.
Monitor SaO_2; O_2 by nasal cannula; Strict pulmonary care.

CV:
Dysrhythmias and hypertension are common.
Heart Failure, Pericarditis, Cardiac arrest.
Hemodynamic instability occurs in 25% of pts during dialysis.
Anemia undermines O_2 delivery; some prescribe Epogen.

Infection:
Strict care of airway, pulmonary, wounds, invasive devices.
Remove foley catheter. Minimize intravascular catheters.
Beware that febrile & WBC response will be less pronounced.

Bleeding Risk:
GI bleed occurs in 1/3 of pts (usually mild) but accounts for 3 - 8% of deaths. Monitor H/H, platelets, PT, PTT.
Guaiac test of stool, NG aspirate, vomitus.
H_2 inhibitor or Propton Pump Inhibitor may be given as prophylaxis, but some are linked to acute interstitial nephritis.
Some use DDAVP or cryoprecipitate (effects are short-lived).

Nutrition:
Early, aggressive nutritional support improves survival.
Most have marked increase in protein catabolism.
Carbohydrate: 300 g/day to prevent protein catabolism.
Calories: 35 Kcal/kg/day (or 1800 - 2500 Kcal/day)
Protein: 0.6 - 0.7 g/kg/day (1 - 2 g/kg/day if pt on CRRT)
Restrict: High-K foods (see next page).