




# ACUTE RENAL FAILURE




# DEFINITION

- ARF is a life –threatening situation with abrupt impairment of renal function resulting in retention of nitrogenous wastes and inappropriate regulation of fluid & electrolyte homeostasis.
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# Causes

**1. Pre-renal failure**( renal insufficiency due to either systemic hypovolemia or renal hypo perfusion)

- Age
  - Hemorrhage
  - Shock
  - CHF
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## 2. Intrinsic Renal Failure


- Acute tubular necrosis-fluid loss, shock, Intravascular hemolysis, sepsis, nephrotoxic drugs, toxins
- Interstitial nephritis-infections, drugs, auto immune diseases, idiopathic
- Glomerulonephritis-AGN, Renal vasculitis
- Hemolyticuremic syndrome
- Renal vein thrombosis

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- ### 3. Post-renal failure ( occurs as a consequences of mechanical obstruction in the collecting system )
- Calculus
  - Ureterovesical obstruction
  - Neurogenic bladder
  - outlet obstruction by tumor, stones or edema

# Pathophysiology


## Prerenal ARF

- Decreased perfusion of the kidney
- ↓
- Ischemia
- ↓
- Cellular swelling & injury
- ↓
- Cell death
- ↓
- Decreased GFR
- ↓
- Oliguria & azotemia (elevated blood levels of urea, creatinine, & uric acid) & electrolyte imbalances

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- Intrarenal ARF- causes acute ischemic damage to kidney tissues
  - Post renal ARF- Obstruction increases pressure within the kidney, which decreases renal function



# Manifestations

- Electrolyte imbalances
  - Fluid imbalances-anuria or severe oliguria
  - Increased serum creatinine & BUN
  - Acid-base imbalances
  - Poor feeding or decreased appetite
  - Vomiting
  - Lethargy
  - Seizures
  - Pallor
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# Diagnostic Evaluation

- History-
- Serum creatinine & BUN-elevated
- Metabolic acidosis-bcoz low serum bicarbonate
- Serum potassium-increased
- Serum sodium-increased or decreased depending on fluid status
- BP-elevated
- Renal USG-to diagnose any obstruction-It assess blood flow, function, & obstruction
- Urine-concentrated –increases s.gravity
- Output-less

# Management

- Fluid imbalances
- Fluid replacement-if dehydrated- IVF 20-30ml/kg of NS or Ringers lactate over 45-60mts
- If Hemorrhage-Give Blood transfusion
- Fluid intake is carefully calculated to replace insensible fluid loss and urinary output
- Frusemide-2-3mg/kg IV
- Monitor IO, weight, physical examination & serum sodium-needed to give fluid therapy

# Diet therapy

- Food should be low in sodium & potassium
- High calorie food
- Moderate restriction of protein
- If critically ill- Parenteral hyperalimentation with essential amino acids
- Vitamin & micronutrient supplements

# Dialysis

- Dialysis is a process of removing waste products and excess body fluid and regulating electrolytes and minerals.
- Types: 1. Hemodialysis 2. Peritoneal dialysis
- Indications
  1. Severe fluid overload
  2. Pulmonary edema or CHF caused by fluid overload
  3. Severe hypertension
  4. Metabolic acidosis not responsive to medications
  5. BUN level >120mg/dl



# Nursing management

- Risk for fluid electrolyte imbalance related to impaired renal function
- Risk for infection related to alteration of host defense
- Activity intolerance related to acute illness
- Altered nutrition less than body requirement related to GI disturbances
- Fear & anxiety related to life threatening illness.




**THANK YOU**




# Electrolyte imbalances

- Potassium
- Potassium is restricted from the diet & IV Fluids
- Interventions to remove potassium-gastric suction, administration of exchange resin, such as Kayexalate, administration of Sodium bicarbonate, glucose & insulin

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- Sodium-may be elevated or decreased
  - Fluid restriction-improves the serum sodium level
  - Any replacement sodium is adjusted to maintain a normal sodium level



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- Acid-Base Imbalances
  - Additional sodium bicarbonate orally or IV-Child with ARF are unable to excrete hydrogen ions & ammonia through urine