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PATHOPHYSIOLOGY

UNIT 2

TOPIC :

- **Renal system : Acute and chronic renal failure**



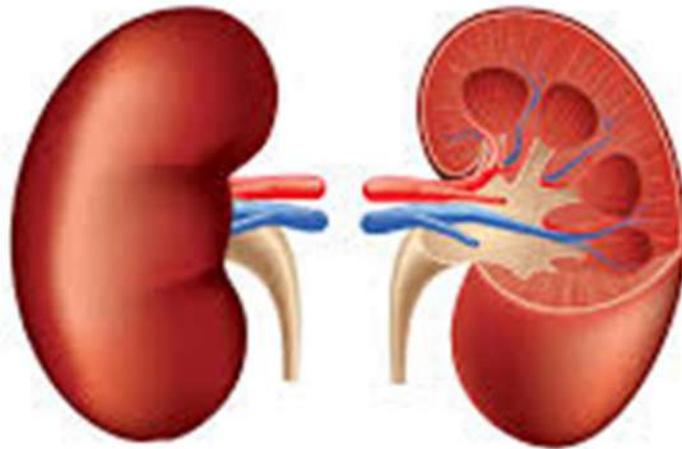
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Renal system

Acute Renal Failure (ARF) / Acute Kidney Injury (AKI)

- ARF is a sudden decline in kidney function over hours to days.
- It is usually reversible if diagnosed and treated early.



Etiology:

- **Pre-renal:** Hypovolemia, dehydration, heart failure, shock
- **Renal (intrinsic):** Glomerulonephritis, nephrotoxic drugs, acute tubular necrosis
- **Post-renal:** Obstruction (stones, tumor, enlarged prostate)

Pathogenesis:

1. Sudden damage or obstruction →
2. Decreased blood filtration →
3. Accumulation of waste (urea, creatinine) →
4. Electrolyte imbalance →
5. Clinical symptoms of kidney failure

Clinical Manifestations:

- ⤴ Sudden **oliguria** (↓ urine output) or **anuria**
- ⤴ **Swelling** of legs and face
- ⤴ **Nausea, vomiting**
- ⤴ **Shortness of breath**
- ⤴ **Confusion**
- ⤴ **Elevated creatinine and urea**

Non-Pharmacological Management:

- ❖ Monitor fluid and electrolyte balance
- ❖ Control diet (low salt, potassium)
- ❖ Treat underlying cause (e.g., dehydration)

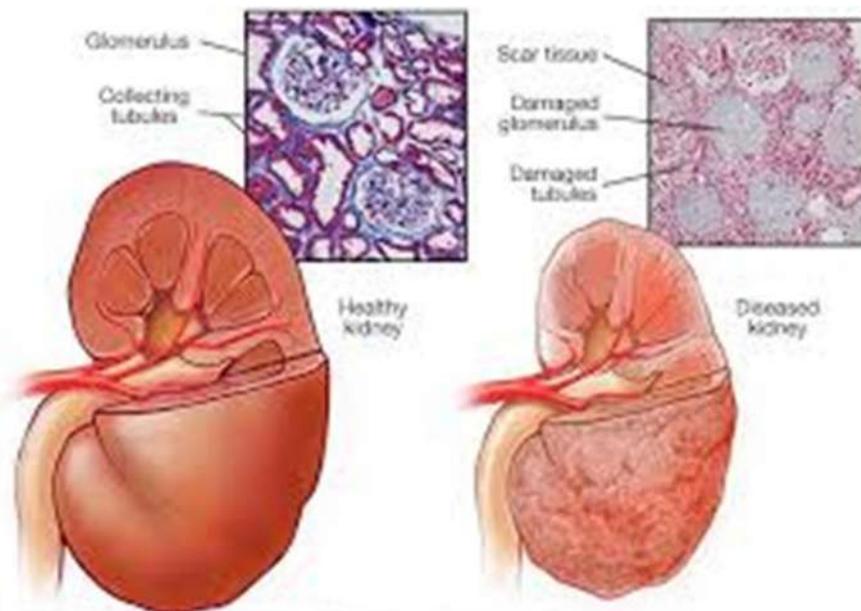
Pharmacological Management:

- ✚ **Diuretics** (furosemide)
- ✚ **Electrolyte correction**
- ✚ **Antibiotics** (if infection)
- ✚ **Dialysis** (temporary)

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Chronic Renal Failure (CRF) / Chronic Kidney Disease (CKD)

- CRF is a slow, progressive, and irreversible loss of kidney function over months or years.
- It eventually leads to End Stage Renal Disease (ESRD) requiring dialysis or kidney transplant.



Etiology:

- **Diabetes mellitus** (most common)
- **Hypertension**
- **Chronic glomerulonephritis**
- **Polycystic kidney disease**
- **Prolonged obstruction**
- **Autoimmune disorders (SLE)**

Pathogenesis:

1. Long-term kidney damage →
2. Progressive nephron loss →
3. Decreased GFR →
4. Accumulation of toxins, anemia, bone disorders, acidosis

Clinical Manifestations:

- ✦ **Fatigue, weakness**
- ✦ **Persistent edema**
- ✦ **Anemia**
- ✦ **Loss of appetite**
- ✦ **Uremic symptoms** (itching, confusion)
- ✦ **Hypertension**
- ✦ **Altered urine output**

Non-Pharmacological Management:

- ⤴ **Low-protein, low-potassium, low-phosphate diet**
- ⤴ **Fluid restriction**
- ⤴ **Avoid nephrotoxic drugs**
- ⤴ **Lifestyle changes** to control diabetes and BP

Pharmacological Management:

- ❖ ACE inhibitors/ARBs (ramipril, losartan)
- ❖ Erythropoietin for anemia
- ❖ Calcium and vitamin D supplements
- ❖ Phosphate binders (sevelamer)
- ❖ Sodium bicarbonate (acidosis)
- ❖ Diuretics (loop diuretics for edema)
- ❖ Dialysis (long-term)
- ❖ Kidney transplant (permanent solution)