

Lecture# 7
semester# 2

Renal System Disorders (chronic renal failure)

:by

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Chronic kidney disease

Chronic kidney disease (CKD) is a term that describes kidney damage or a decrease in the glomerular filtration rate (GFR) for 3 or more months. CKD is associated with decreased quality of life and premature death. Untreated CKD can result in end stage renal disease (ESRD) and necessary renal replacement therapy (dialysis or kidney transplantation).

CHRONIC KIDNEY DISEASE

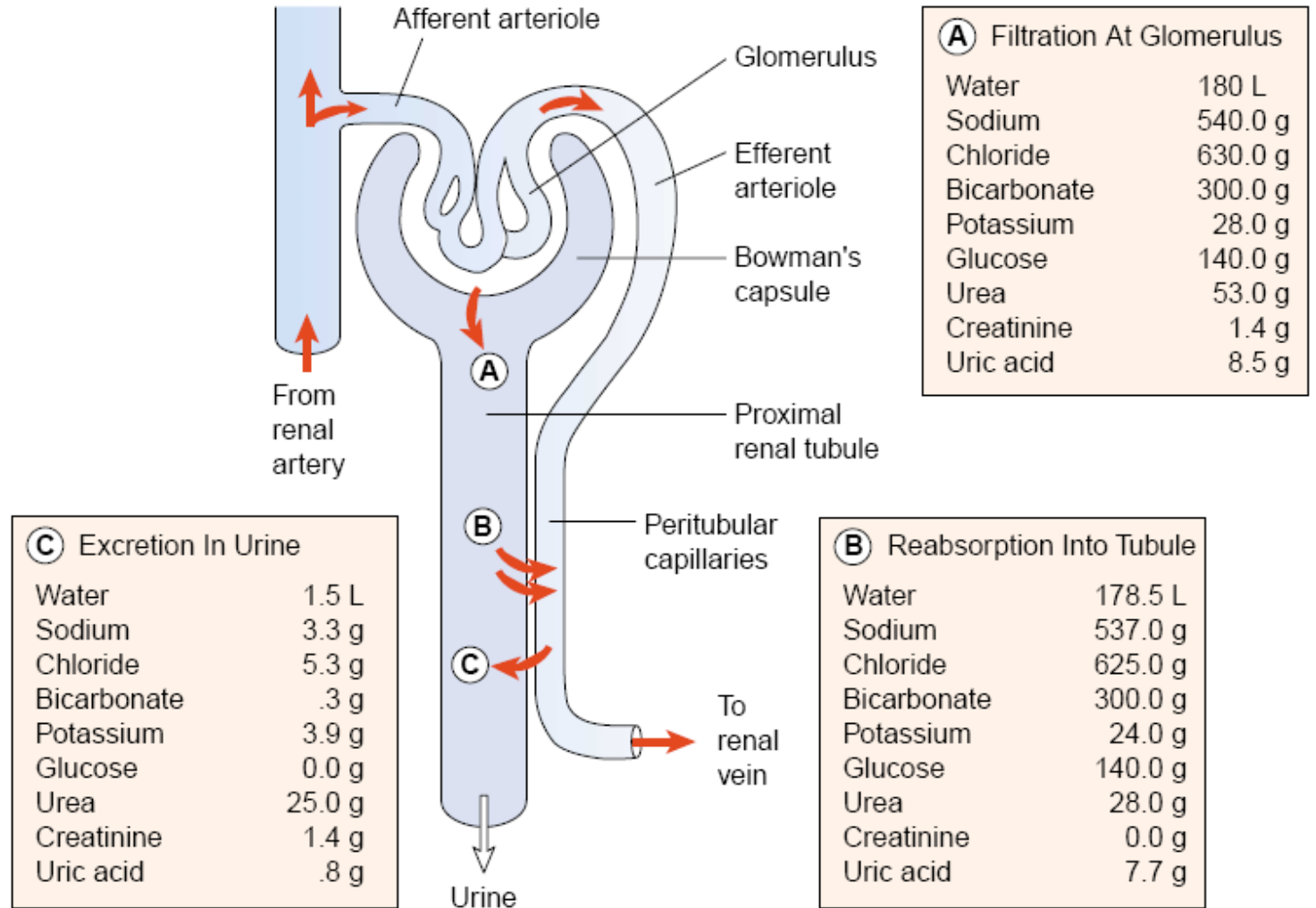
Chronic renal failure

End stage renal failure

$$\mathbf{GFR} = \frac{(\text{Volume of urine [mL/min]} \times \text{urine creatinine [mg/dL]})}{\text{serum creatinine (mg/dL)}}$$

Chronic Renal Failure

It is a **permanent irreversible** destruction of nephron leading to severe deterioration of renal function, finally resulting to **end stage renal disease**.



Stages of chronic kidney disease

| stages | Description | GFR |
|--------|--|----------|
| 1. | Slight kidney damage with normal or increased filtration | >90 ml |
| 2. | Mild decrease in kidney function | 60-89 ml |
| 3. | Moderate decrease in kidney function | 30-59 ml |
| 4. | Severe decrease in kidney function | 10-29 ml |
| 5. | Kidney failure :requiring dialysis or transplantation | <10 ml |

Common causes of chronic kidney disease

Recurrent untreated conditions include:

a) Urinary tract infections disease

b) Other chronic diseases

c) Glomerulonephritis

Obstructive uropathy.

a) Posterior urethral valves

b) Pelviureteric junction obstruction

c) Renal stones.

Clinical features

- Symptom of azotemia (increase BUN in blood)
- Fever, Malaise
- Anorexia, Nausea
- hyperkalemia
- left ventricular failure or pericarditis
- Uremic pruritus
- Swellings and Pulmonary edema
- Muscle weakness.

Investigations

Blood investigations - CBC

- S.urea
- S.creatinine
- S.sodium
- S.potassium
- S.calcium
- S.phosphate
- Alkaline phosphate

Urine routine/microscopic examination.

- Urinalysis, microscopic exam, quantitation of protein in urine (protein : creatinine ratio)

Diagnostic finding

- a. Renal Ultrasound or Doppler ultrasound or angiography.
- b. Spiral CT scan to evaluate renal artery stenosis .
- c. MRI preferred over contrast agents.
- d. Renal x- ray.

END STAGE RENAL DISEASE

When the patient become or reach to end stage renal failure (ESRD) he indicate the following:

- Hemodialysis
- Peritoneal dialysis
- Kidney transplantation

Indications for hemodialysis

- a. Uremia - azotemia with symptoms and/or signs .
- b. Severe Hyperkalemia.
- c. Volume Overload - usually with congestive heart failure (pulmonary edema).
- d. Toxin Removal.

Dialysis

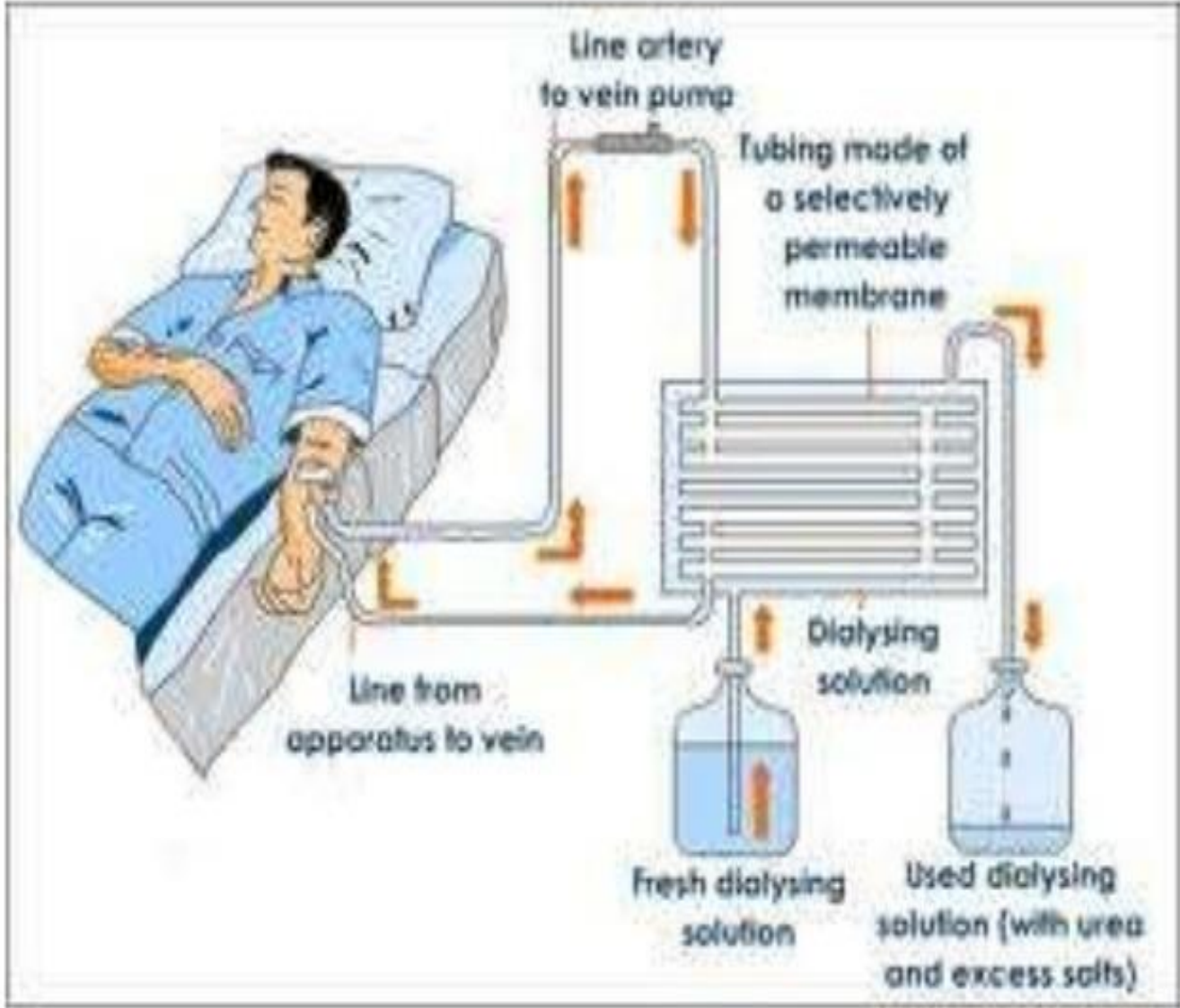
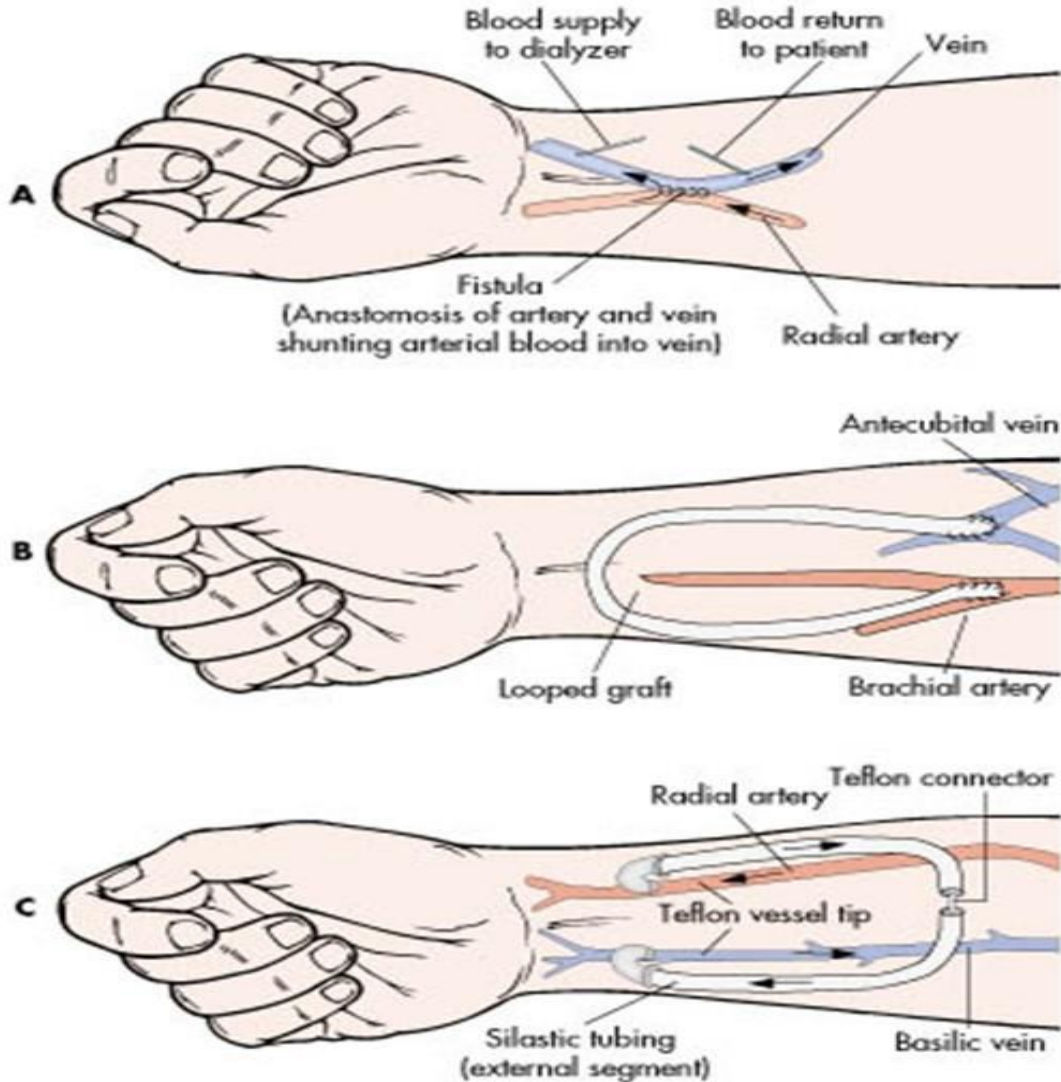


Figure 44-11 Methods of vascular access for hemodialysis. **A**, Internal arteriovenous fistula. **B**, Looped graft in forearm. **C**, External cannula or shunt.

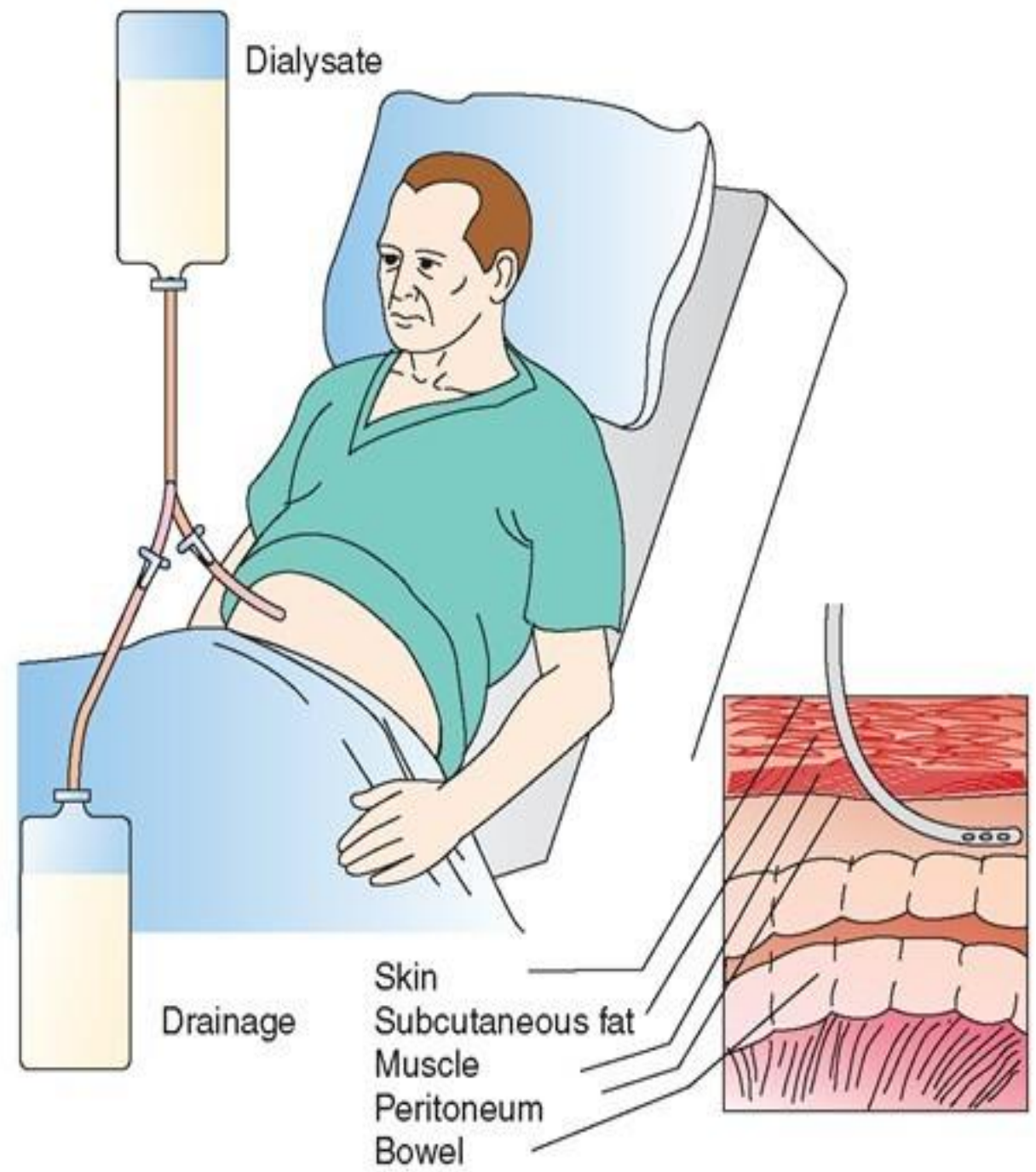
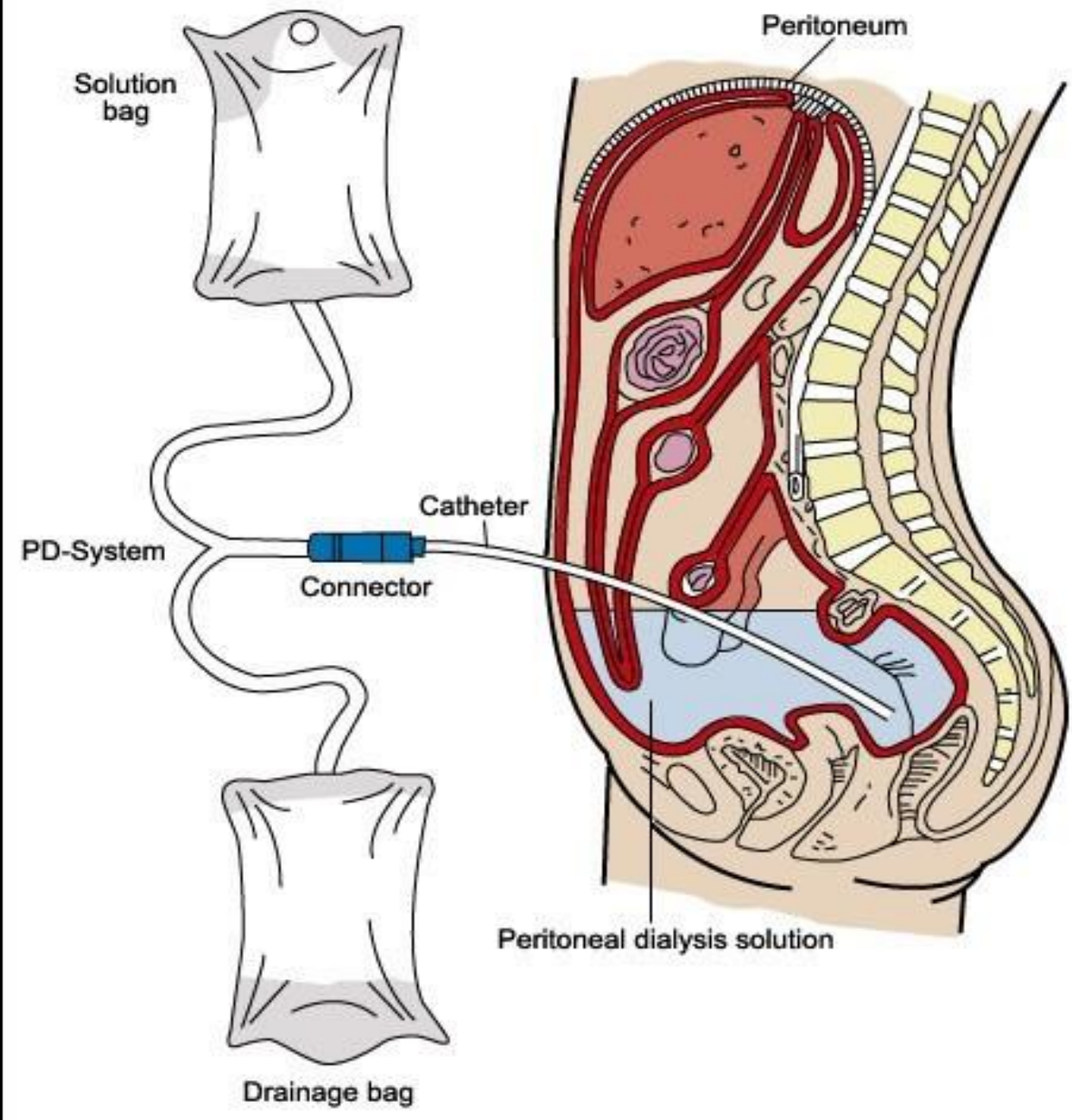
Efficacy of hemodialysis

- a. Some acids, BUN and creatinine are reduced
- b. Phosphate is dialyzed, but quickly released from bone
- c. Very effective at reducing intravascular volume/potassium
- d. Not all uremic toxins are removed and patients generally do not feel "normal"
- e. Response of anemia to erythropoietin is often suboptimal with hemodialysis.

PERITONEAL DIALYSIS

- ❑ The goals of PD are to remove toxic substances and metabolic wastes and to reestablish normal fluid and electrolyte balance.
- ❑ PD may be the treatment of choice for patients with renal failure who are unable or unwilling to undergo hemodialysis or renal transplantation .
- ❑ Patients who are susceptible to the rapid fluid, electrolyte, and metabolic changes that occur during hemodialysis experience fewer of these problems with the slower rate of PD.

Principle of Peritoneal Dialysis



Nursing Diagnosis

- ✓ Impaired skin integrity related to fluid imbalances .
- ✓ Risk for injury related to fistula.
- ✓ Activity intolerance related to nutrition status changes.
- ✓ Fluid volume excessive related to tubular dysfunction. Psychological distress (e.g depression or anxiety).
- ✓ Self-esteem disturbances related to decrease daily living activity.

Nursing Management

1. Auscultate heart and lung sounds. Evaluate presence of peripheral edema, vascular congestion and reports of dyspnea.
2. monitor body vital signs.
3. Assess presence and degree of hypertension and give antihypertensive drugs if need such (Capoten, Apresoline and lasix).
4. Monitor level of consciousness and behavior.
5. Observe for oozing from venipuncture sites, bleeding, ecchymotic areas and any slight trauma.
6. Encourage adequate calorie intake, especially from carbohydrates, regulating protein intake according to level of renal function and avoid sodium and potassium.
7. Monitor fluid intake and hydration of skin, mucous membranes and Inspect skin for changes in color, turgor, vascularity.