



Renal Failure

Acute and Chronic

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Acute Renal Failure

- Sudden interruption of kidney function resulting from obstruction, reduced circulation, or disease of the renal tissue
- Results in retention of toxins, fluids, and end products of metabolism
- Usually reversible with medical treatment
- May progress to end stage renal disease, uremic syndrome, and death without treatment

Acute Renal Failure

Persons at Risks

- Major surgery
- Major trauma
- Receiving nephrotoxic medications
- Elderly

Acute Renal Failure

Causes

- Prerenal
 - Hypovolemia, shock, blood loss, embolism, pooling of fluid d/t ascites or burns, cardiovascular disorders, sepsis
- Intrarenal
 - Nephrotoxic agents, infections, ischemia and blockages, polycystic kidney disease
- Postrenal
 - Stones, blood clots, BPH, urethral edema from invasive procedures

Acute Renal Failure

Stages

- Onset – 1-3 days with \wedge BUN and creatinine and possible decreased UOP
- Oliguric – UOP $<$ 400/d, \wedge BUN, Crest, Phos, K, may last up to 14 d
- Diuretic – UOP \wedge to as much as 4000 mL/d but no waste products, at end of this stage may begin to see improvement
- Recovery – things go back to normal or may remain insufficient and become chronic

Acute Renal Failure

Subjective symptoms

- Nausea
- Loss of appetite
- Headache
- Lethargy
- Tingling in extremities

Acute Renal Failure

Objective symptoms

● Oliguric phase –

- vomiting
- disorientation,
- edema,
- ^K+
- decrease Na
- ^ BUN and creatinine
- Acidosis
- uremic breath
- CHF and pulmonary edema
- hypertension caused by hypovolemia, anorexia
- sudden drop in UOP
- convulsions, coma
- changes in bowels

Acute Renal Failure

Objective symptoms

Diuretic phase

- Increased UOP
- Gradual decline in BUN and creatinine
- Hypokalemia
- Hyponatremia
- Tachycardia
- Improved LOC

Acute Renal Failure

Diagnostic tests

- H&P
- BUN, creatinine, sodium, potassium. pH, bicarb. Hgb and Hct
- Urine studies
- US of kidneys
- KUB
- ABD and renal CT/MRI
- Retrograde pyelogram

Acute Renal Failure

Medical treatment

- Fluid and dietary restrictions
- Maintain E-lytes
- D/C or change cause
- May need dialysis to jump start renal function
- May need to stimulate production of urine with IV fluids, Dopamine, diuretics, etc.

Acute Renal Failure

Medical treatment

- Hemodialysis
 - Subclavian approach
 - Femoral approach
- Peritoneal dialysis
- Continuous renal replacement therapy (CRRT)
 - Can be done continuously
 - Does not require dialysate

Acute Renal Failure

✓ Nursing interventions

- Monitor I/O, including all body fluids
- Monitor lab results
- Watch hyperkalemia symptoms: malaise, anorexia, paresthesia, or muscle weakness, EKG changes
- watch for hyperglycemia or hypoglycemia if receiving TPN or insulin infusions
- Maintain nutrition
- Safety measures
- Mouth care
- Daily weights
- Assess for signs of heart failure
- GCS and Denny Brown
- Skin integrity problems

Chronic Renal Failure

- Results form gradual, progressive loss of renal function
- Occasionally results from rapid progression of acute renal failure
- Symptoms occur when 75% of function is lost but considered chronic if 90-95% loss of function
- Dialysis is necessary D/T accumulation or uremic toxins, which produce changes in major organs

Chronic Renal Failure

- ☞ Subjective symptoms are relatively same as acute
- ☞ Objective symptoms
 - Renal
 - Hyponatremia
 - Dry mouth
 - Poor skin turgor
 - Confusion, salt overload, accumulation of K with muscle weakness
 - Fluid overload and metabolic acidosis
 - Proteinuria, glycosuria
 - Urine = RBC's, WBC's, and casts

Chronic Renal Failure

Objective symptoms

● Cardiovascular

- Hypertension
- Arrhythmias
- Pericardial effusion
- CHF
- Peripheral edema

● Neurological

- Burning, pain, and itching, paresthesia
- Motor nerve dysfunction
- Muscle cramping
- Shortened memory span
- Apathy
- Drowsy, confused, seizures, coma, EEG changes

Chronic Renal Failure

Objective symptoms

● GI

- Stomatitis
- Ulcers
- Pancreatitis
- Uremic fetor
- Vomiting
- constipation

● Respiratory

- ^ chance of infection
- Pulmonary edema
- Pleural friction rub and effusion
- Dyspnea
- Kussmaul's respirations from acidosis

Chronic Renal Failure

Objective symptoms

● Endocrine

- Stunted growth in children
- Amenorrhea
- Male impotence
- ^ aldosterone secretion
- Impaired glucose levels
R/T impaired CHO metabolism
- Thyroid and parathyroid abnormalities

● Hemopoietic

- Anemia
- Decrease in RBC survival time
- Blood loss from dialysis and GI bleed
- Platelet deficits
- Bleeding and clotting disorders – purpura and hemorrhage from body orifices , ecchymoses

Chronic Renal Failure

Objective symptoms

● Skeletal

- Muscle and bone pain
- Bone demineralization
- Pathological fractures
- Blood vessel calcifications in myocardium, joints, eyes, and brain

● Skin

- Yellow-bronze skin with pallor
- Pruritis
- Purpura
- Uremic frost
- Thin, brittle nails
- Dry, brittle hair, and may have color changes and alopecia

Chronic Renal Failure

Lab findings

- BUN – indicator of glomerular filtration rate and is affected by the breakdown of protein. Normal is 10-20mg/dL. When reaches 70 = dialysis
- Serum creatinine – waste product of skeletal muscle breakdown and is a better indicator of kidney function. Normal is 0.5-1.5 mg/dL. When reaches 10 x normal, it is time for dialysis
- Creatinine clearance is best determinant of kidney function. Must be a 12-24 hour urine collection. Normal is > 100 ml/min

Chronic Renal Failure

☞ K⁺ -

- The kidneys are means which K⁺ is excreted. Normal is 3.5-5.0 ,mEq/L. maintains muscle contraction and is essential for cardiac function.
- Both elevated and decreased can cause problems with cardiac rhythm
- Hyperkalemia is treated with IV glucose and Na Bicarb which pushes K⁺ back into the cell
- Kayexalate is also used

Chronic Renal Failure

Ca

- With disease in the kidney, the enzyme for utilization of Vit D is absent
- Ca absorption depends upon Vit D
- Body moves Ca out of the bone to compensate and with that Ca comes phosphate bound to it.
- Normal Ca level is 4.5-5.5 mEq/L
- Hypocalcemia = tetany
 - Treat with calcium with Vit D and phosphate
 - Avoid antacids with magnesium

Chronic Renal Failure

Other abnormal findings

- Metabolic acidosis
- Fluid imbalance
- Insulin resistance
- Anemia
- Immunological problems

Chronic Renal Failure

- ☞ Medical treatment
- ☞ IV glucose and insulin
- ☞ Na bicarb, Ca, Vit D, phosphate binders
- ☞ Fluid restriction, diuretics
- ☞ Iron supplements, blood, erythropoietin
- ☞ High carbs, low protein
- ☞ **Dialysis - After all other methods have failed**

Chronic Renal Failure

☞ Hemodialysis

- Vascular access
 - Temporary – subclavian or femoral
 - Permanent – shunt, in arm
 - Care post insertion
- Can be done rapidly
- Takes about 4 hours
- Done 3 x a week

Chronic Renal Failure

Peritoneal dialysis

- Semipermeable membrane
- Catheter inserted through abdominal wall into peritoneal cavity
- Cost less
- Fewer restrictions
- Can be done at home
- Risk of peritonitis
- 3 phases – inflow, dwell and outflow

Automated peritoneal dialysis

- Done at home at night
- Maybe 6-7 times /week

CAPD

- Continuous ambulatory peritoneal dialysis
- Done as outpatient
- Usually 4 X/d

Chronic Renal Failure

Nursing care

- Frequent monitoring
- Hydration and output
- Cardiovascular function
- Respiratory status
- E-lytes
- Nutrition
- Mental status
- Emotional well being
- Ensure proper medication regimen
- Skin care
- Bleeding problems
- Care of the shunt
- Education to client and family

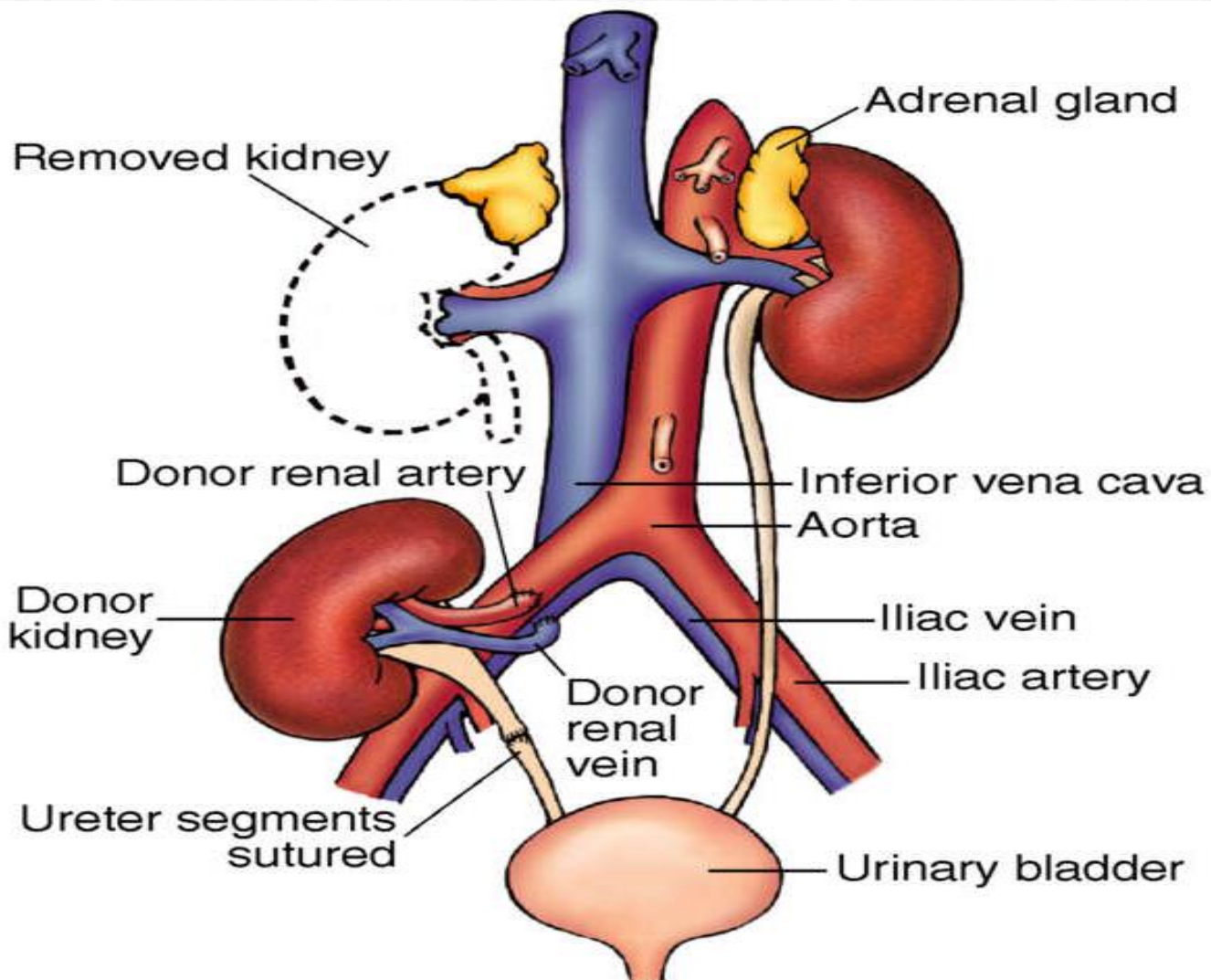
Chronic Renal Failure

- ✓ Nursing diagnosis
 - Excess fluid volume
 - Imbalanced nutrition
 - Ineffective coping
 - Risk for infection
 - Risk for injury

Chronic Renal Failure

Transplant

- Must find donor
- Waiting period long
- Good survival rate – 1 year 95-97%
- Must take immunosuppressant's for life
- Rejection
 - Watch for fever, elevated B/P, and pain over site of new kidney



Chronic Renal Failure

Post op care

- ICU
- I/O
- B/P
- Weight changes
- Electrolytes
- May have fluid volume deficit
- High risk for infection

Transplant Meds

- ☞ Patients have decreased resistance to infection
- ☞ Corticosteroids – anti-inflammatory
 - Deltasone
 - Medrol
 - Solu-Medrol
- ☞ Cytotoxic – inhibit T and B lymphocytes
 - Imuran
 - Cytoxan
 - Cellcept
- ☞ T-cell depressors - Cyclosporin