Dialysis

Dialysis is a treatment designed to remove waste products from the blood in patients with kidney failure, who have a GFR < 15mL/min. Hemodialysis is a technique that uses a semipermeable membrane, or dialyzer, to remove impurities in the blood. Hemodialysis is usually conducted in three to eight hour sessions, three times per week. Continuous renal replacement therapy (CRRT) is similar to hemodialysis; however, this method is used in critical patients who may be more sensitive to rapid changes in fluid volume. Another method of dialysis, called peritoneal dialysis, uses the lining of the abdomen as a filter to remove waste products from the body. Because peritoneal dialysis is performed daily, levels of electrolytes and waste products stay more constant. Continuous ambulatory peritoneal dialysis (CAPD) is an option for active patients who desire more flexibility in their treatment schedule.



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Hemodialysis
He-man-dial-machine
Hemodialysis is the most common way to treat advanced kidney disease. It involves the use of a machine that uses a special filter to remove waste and extra fluid from the blood. Blood flows from the patient into a dialysis machine, with clean blood being returned to the body. Patients on hemodialysis require a strict schedule and typically go to a center for treatment 3 or 5 days a week. The patient will require either an arteriovenous fistula (AVF) or an arteriovenous graft (AVG) to connect their vascular system to the hemodialysis machine.

Rapid Shifts of Fluid and Electrolytes
Rapid-rabbit Shifting Fluid with Electric-lights
With this method of dialysis, patients undergo rapid shifts in fluid and electrolyte levels. Hemodialysis sessions are conducted three times per week for approximately 3 to 8 hours each session. Because this treatment is not performed daily, patients may experience fluctuations in physical well-being related to the build-up of waste products between treatments.

Disequilibrium Syndrome
Dice-unequal
Dialysis disequilibrium is a rare syndrome that occurs when waste products are removed too quickly from the blood. This rapid change in solute concentration leads to cerebral edema. The syndrome is characterized by nausea, vomiting, headache, and, in severe cases, seizure and coma.

Hypotension
Hippo-BP
A rapid change in vascular volume can cause hypotension in patients undergoing hemodialysis. If this occurs, the rate or volume of fluid removal can be decreased.

NO BP IN ARM with Shunt or Fistula
NO BP allowed at arm with Shunt and Fist-shaped-tunnel
A blood pressure reading should not be taken on the arm with the shunt (graft) or fistula. The pressure needed to obtain an accurate blood pressure reading could disrupt the shunt or possibly rupture the fistula.

Assess for Thrill and Bruit
Thrilled-heart with Bruit-Brew
When palpated, a thrill, or movement of blood through the fistula, can be felt where the artery and vein are anastomosed. A bruit, or audible rushing sound, should also be heard when the fistula is auscultated with a stethoscope.

Peritoneal Dialysis
Parrot-toe Dial-machine
Peritoneal dialysis is a less costly treatment for chronic renal failure and involves the use of the patient's peritoneum in the abdomen as a membrane to filter blood products. Fluid is introduced through a tube into the abdomen, from which fluids are slowly exchanged and filtered through the peritoneum. There are 3 phases to the procedure: inflow (fill), dwell (equilibrium), and drain.

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Slow Process

Slow-snail

Peritoneal dialysis consists of three phases: inflow, dwell, and drain. During the inflow phase, a predetermined amount of dialysate solution is infused through the indwelling dialysis catheter into the peritoneum. The dialysate solution is left to dwell inside the patient's peritoneal cavity to facilitate the removal of waste products from the blood. When the dwell phase is completed, the patient drains the solution from the peritoneal cavity using gentle pressure on the abdomen or changes in position.

Peritonitis

Parrot-toe-on-fire

Inflammation of the peritoneum can develop when improper technique is used to perform the dialysis procedure or when infections of the catheter insertion site travel down the catheter and into the abdomen. Organisms such as Staphylococcus aureus are typically responsible for peritonitis. Incorrect insertion or manipulation of the dialysis catheter could result in bowel or bladder perforation.

Loss of Protein

Down-arrow Mr. Protein

Proteins can pass through the peritoneal membrane, resulting in a loss of protein when the peritoneal dialysis solution is drained. This loss is the reason that amino acid peritoneal solutions are often used for patients needing nutritional supplementation.

Hyperglycemia

Hiker-glue-bottle

Because the peritoneal dialysis solution is high in glucose, when kept in the body for too long, the dialysate solution may cause hyperglycemia.

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