Peritoneal Dialysis

The Facts

The kidneys help sustain life by "cleaning" the blood of waste products and secreting hormones the body needs. While most people have two kidneys, one healthy kidney can carry out all the functions alone. In fact, some people are born with only one kidney.

When the kidneys fail to function properly, harmful wastes accumulate in the body and cause multiple health problems, even death. By far, the two most common causes of kidney failure (also called renal failure) are diabetes and hypertension.

Whenever a person's kidney function is less than 10% of normal, he or she is considered to have "end-stage renal disease" (ESRD). Fortunately, there are artificial methods for performing many of the kidney's functions. Dialysis is a method of filtering the blood and removing harmful wastes. Most people on dialysis have the blood filtered through a machine during a process called hemodialysis. Some people prefer to use a method called peritoneal dialysis, in which the blood is filtered inside the abdominal cavity.

Dialysis does not cure kidney failure. However, it does replace kidney function to a sufficient extent that some people live for many years on dialysis.

Peritoneal Dialysis

Peritoneal dialysis is the oldest method of filtering the blood of ESRD patients. Such patients have been treated with peritoneal dialysis for more than 60 years. Peritoneal dialysis today is technically simpler and the equipment is much easier to use. However, the underlying principles of the procedure are the same.

How it works

Peritoneal dialysis is a procedure that removes extra fluids, wastes, and some chemicals from the body. The entire abdominal cavity is lined with a special membrane called the "peritoneum." Peritoneal dialysis uses this membrane to filter the blood. There are tiny blood vessels (capillaries) throughout the peritoneum. The membrane is permeable and allows fluids and salts from the blood vessels to pass through it. When concentrated sugar and mineral solutions are introduced into the abdominal cavity and allowed to dwell inside, the extra sugar "pulls" wastes and extra fluid from the capillaries through the peritoneum and into the abdominal cavity. The solutions are drawn out of the abdominal cavity and drained to the outside, thus removing the accumulated wastes and fluid.

Before dialysis starts

Not all ESRD patients are good candidates for peritoneal dialysis. The patient's physician usually discusses the treatment options with the patient and together they determine whether hemodialysis or peritoneal dialysis is best for the individual patient.

» Some patients select peritoneal dialysis rather than hemodialysis because it can be completed in the home. Therefore the patients need not travel to a hemodialysis center three times a week. It allows more flexibility so patients need not schedule all their activities based on the appointments at the dialysis centers. Many patients travel, taking their supplies with them or arranging to have them delivered at their destination. Another reason

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for selecting peritoneal dialysis is because the diet is less restrictive. Although all ESRD patients will have dietary restrictions, they are somewhat less severe with peritoneal dialysis compared to hemodialysis.

» There are some disadvantages to peritoneal dialysis. There is a permanent catheter that remains in the abdomen and some patients object to that. Some patients simply don't like the amount of work involved and are not committed to performing the dialysis as ordered. Failure to follow the regimen can lead to serious complications. Other patients cannot physically perform the dialysis themselves and have no caregiver available to assist them.

Whenever a patient decides to have peritoneal dialysis, a surgeon places a small catheter into the abdominal cavity. This is usually done in the operating room, but does not usually require general anesthesia and the patient does not stay overnight at the hospital.

The process

While there are three types of peritoneal dialysis used, the basic process is the same.

1. Sugar and mineral solution, called the dialysate, is drained from its storage bag through the catheter into the abdominal cavity.
2. The catheter is clamped and the dialysate remains in the cavity for a period of time. The time interval that the dialysate remains in the abdominal cavity is called the "dwell" time. It varies, depending on the type of dialysis being done.
3. Following the dwell time, the catheter is unclamped. The dialysate is drained out of the abdominal cavity, along with additional fluids and filtered wastes.
4. The process is repeated.

Each completed process is known as an "exchange" or "cycle."

Types of peritoneal dialysis

There are three types of peritoneal dialysis done in the home, and two are much more common than the third. They are continuous ambulatory peritoneal dialysis (CAPD), continuous cycling peritoneal dialysis (CCPD), and intermittent peritoneal dialysis (IPD). CAPD is the most common method and CCPD is the second most common. Both of these types are much more commonly used than IPD.

CAPD

CAPD does not require any machines. The sterile bag containing the dialysate (about two quarts) is allowed to drain by gravity through the catheter and remains in the abdominal cavity for four to six hours. In most cases, the bag remains attached to the tubing and the patient folds it and secures it to his or her waist under the clothing. However, some of the newer systems have bags that are disconnected. While the solution makes the abdomen feel full and somewhat distended, the patient can continue most activities while the dialysate is inside. At the appropriate time, the dialysate is drained out of the abdomen, measured, recorded, and then discarded. The exchange is complete. A sterile bag of dialysate is allowed to drain in and start the process again. During the night, the dialysate usually remains in the abdomen while the patient is sleeping and it is drained eight hours later when the patient awakens.

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CCPD

CCPD is very much like CAPD except that it requires the use of machines, and is usually done only at night, leaving the patient free of exchanges during the day. The machine, (called a "cycler") automatically warms, fills, drains, and weighs the solutions at timed intervals throughout the night. The patient prepares the machine before going to bed and then disconnects and cleans the equipment the following morning.

IPD

The patient at home can do IPD, but it is more often done in nursing facilities and hospitals than in the home. IPD requires a machine similar to the CCPD cycler, and the treatments take much longer, usually 12 hours. For that period of time the patient cannot be ambulatory, since he or she must remain near the machine for the dialysis. The advantage of this type of peritoneal dialysis is that it doesn't always need to be done every day.

Problems related to ESRD and/or peritoneal dialysis

Peritonitis is an infection of the peritoneum and is a very serious problem. It can occur when the catheter opening becomes contaminated and infected. It can also occur because of the patient's failure to follow aseptic precautions. Following are some signs and symptoms of peritonitis:

- Redness, swelling, pain, and/or drainage from around the catheter
- Abdominal pain
- Fever and chills
- Exhaustion and aching
- Cloudy dialysate when it is drained from the abdomen
- Unusual color or odor of the dialysate when it is drained

Itching occurs in many people treated with peritoneal dialysis. It is often worse during or just after an exchange. Sometimes antihistamine medications provide relief. It is very important to prevent excessively dry skin and most patients should use moisturizers and creams regularly.

Sleep disorders of various types occur in patients treated with peritoneal dialysis. Most patients have some difficulty falling or staying asleep. Patients treated with CAPD may have difficulty because of the fluid volume left in the abdomen overnight. Patients treated with CCPD may be awakened with the cycling of the machine. Some patients actually develop sleep apnea, a condition associated with interrupted breathing. Many patients treated with peritoneal dialysis have problems with "restless leg syndrome." This is a condition in which the person's legs jerk and awaken them. Regardless of the cause, patients with sleep disorders may feel more tired during the day.

Anemia, or low volume of red blood cells, is not a direct result of peritoneal dialysis but is common among ESRD patients. While dialysis removes the toxins and waste, it cannot replace the hormones needed in order to make red blood cells. When these hormones are not produced, there are two few red blood cells to supply the body's needed oxygen. This leads to symptoms of fatigue and can contribute to heart problems.

Renal osteodystrophy is a bone disease caused by ESRD, affecting up to 90% of patients receiving dialysis. It causes the bones to become thin and weak and makes the person more likely to suffer a fracture.

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Depression is common during the initial phase of peritoneal dialysis. Patients may feel overwhelmed with the schedule and keeping track of supplies. In addition, some patients feel that the solution makes them look fat and may develop a poor self-image. Peritoneal dialysis creates many changes in household routines; and many patients have difficulty dealing with all the changes.

Caring for Patients Treated with Peritoneal Dialysis

It is not likely that home health aides will be directly involved in the dialysis procedure. However, there are many special considerations to keep in mind when providing care:

» Read and follow the assignment sheet carefully.

» Provide meticulous skin care to help prevent itching.

» Continuously observe the patient for signs or symptoms of infection. If any is found, report immediately to the supervisor and record it in your visit report.

» Use even greater caution in assisting with transfers to prevent fractures.

» Learn and follow any assignments you may have for food preparation or monitoring.

» Find out the stage of the exchange process before providing cares. If the abdomen is filled with dialysate, take extra caution so as not to cause discomfort.

» Be a good listener. Patients may want to talk with you about their feelings.

Key Points to Keep in Mind

- Dialysis is a treatment, but is not a cure for ESRD.
- The two most common illnesses causing ESRD requiring dialysis are diabetes and hypertension.
- Dialysis does not replace all kidney functions.
- Peritonitis is extremely serious. It is essential that the patient and all caregivers carefully maintain aseptic technique during exchanges and disconnections.
- Patients treated with peritoneal dialysis usually do not sleep well and may need rest periods during the day.

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Peritoneal Dialysis

Case Study

Janie is a new home health aide and has never before cared for a patient being treated with peritoneal dialysis. Today she is assigned to Mrs. Graham who has diabetes, high blood pressure and severe osteoarthritis in addition to renal disease. She is treated with peritoneal dialysis. Janie had told the scheduler she had no experience caring for patients with peritoneal dialysis. But the scheduler had told her that the patient's daughter manages everything about the dialysis, so Janie won't need to mess with any tubes or do any dressing changes. "Besides," says the scheduler, "her daughter is always there to tell you what to do. You'll do just fine. All Mrs. Graham needs is a good bed bath. That's the one thing the daughter won't do."

After greeting Mrs. Graham and her daughter, Janie reviews the assignment sheet. Before Janie can begin to provide cares, the daughter tells her she will be leaving for the hour while Janie is there. Janie is concerned about being alone with Mrs. Graham, but is too timid to ask the daughter anything about the dialysis.

As soon as her daughter leaves, Mrs. Graham asks Janie to run to the kitchen and bring her that piece of pizza from the refrigerator. Janie has noticed that the assignment sheet indicates the patient is on a renal diet but it doesn't have any listing of foods or restrictions. She questions Mrs. Graham, "Are you sure you're supposed to eat pizza?" "Oh, yeah," she replies, "otherwise my daughter wouldn't have left any."

"Perhaps you should wait until we finish your bath and skin care," says Janie. "I'm here for only an hour and that's just enough time. I'll fix the pizza just before I leave." Mrs. Graham said brightly, "Oh, actually my daughter already did my care. She just wanted someone to help me with breakfast and today I feel like pizza. So all you need to do is bring me the pizza and pull up a chair so we can talk."

Think About It

- Do you think Janie should give Mrs. Graham the pizza? Why or why not?
- Do you think it likely that Mrs. Graham's daughter already did all her cares before the aide arrived? Have you ever had patients tell you something similar? How did you handle it?
- What two diagnoses does Mrs. Graham have that often cause kidney failure?
- What questions do you believe Janie should have asked the daughter before she left the house? Since she failed to ask them, what should Janie do about the situation?

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Peritoneal Dialysis

DIRECTIONS: READ EACH QUESTION CAREFULLY. THEN, DETERMINE THE BEST ANSWER. CHECK THE CORRESPONDING BOX ON YOUR ANSWER SHEET. DO NOT WRITE ON THIS POST-TEST.

1. What is the membrane lining the abdominal cavity?
   a. Pleural sac
   b. Peritoneum
   c. Gray matter
   d. Synovial sac

2. Which of the following illnesses are the most common causes of end-stage renal disease (ESRD)?
   a. Diabetes and hypertension
   b. Congestive heart failure and stroke
   c. Cirrhosis and hepatitis
   d. Osteoarthritis and sciatica

3. Which of the following statements is true?
   a. ESRD patients treated with hemodialysis are treated only once a week.
   b. ESRD patients treated with peritoneal dialysis never have dietary restrictions.
   c. Most ESRD patients choose peritoneal dialysis rather than hemodialysis.
   d. Peritoneal dialysis is the oldest method of filtering blood of ESRD patients.

4. Peritoneal dialysis, if continued long enough, cures renal disease.
   a. True
   b. False

5. How is continuous ambulatory peritoneal dialysis (CAPD) different from the other types of peritoneal dialysis?
   a. CAPD does not require any machines.
   b. CAPD does not require a catheter into the abdomen.
   c. CAPD does not take as much time.
   d. CAPD is used only by patients who are ambulatory.

6. Which of the following is usually not related to ESRD or dialysis?
   a. Sleep disorders
   b. Itching
   c. Increased risk of cancer
   d. Anemia

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7. Which of the following might discourage a patient from choosing peritoneal dialysis?
   a. It requires a catheter into the abdomen.
   b. It requires commitment to the tasks that must be performed.
   c. It must be performed more frequently than hemodialysis.
   d. All of the above

8. Which of the following represents the most common method of peritoneal dialysis?
   a. Continuous cycling peritoneal dialysis (CCPD)
   b. Continuous ambulatory peritoneal dialysis (CAPD)
   c. Intermittent peritoneal dialysis (IPD)
   d. Continuous intermittent peritoneal dialysis (CIPD)

9. Which of the following kidney functions is not replaced or corrected by dialysis?
   a. Hormone production
   b. Removal of harmful wastes
   c. Removal of excessive fluid
   d. Filtration of blood

10. Which statement is false?
   a. Dialysis does not replace all kidney functions.
   b. Some patients are not good candidates for peritoneal dialysis.
   c. Dialysis is a cure for kidney disease if started early enough.
   d. Peritonitis is a very serious infection that sometimes affects patients treated with peritoneal dialysis.

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Peritoneal Dialysis

NAME _____ DATE _____

DIRECTIONS: READ EACH QUESTION IN THE POST-TEST CAREFULLY. THEN, DETERMINE THE BEST ANSWER. CHECK THE CORRESPONDING BOX ON THIS ANSWER SHEET. DO NOT WRITE ON THE POST-TEST.

MULTIPLE CHOICE ANSWER SHEET

1.	❑ a	❑ b	❑ c	❑ d
2.	❑ a	❑ b	❑ c	❑ d
3.	❑ a	❑ b	❑ c	❑ d
4.	❑ a	❑ b		
5.	❑ a	❑ b	❑ c	❑ d
6.	❑ a	❑ b	❑ c	❑ d
7.	❑ a	❑ b	❑ c	❑ d
8.	❑ a	❑ b	❑ c	❑ d
9.	❑ a	❑ b	❑ c	❑ d
10.	❑ a	❑ b	❑ c	❑ d

INSTRUCTOR'S COMMENTS/SIGNATURE

Signature _____ RN Date _____

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