

1: Peritoneal Dialysis - Continuous Ambulatory Peritoneal Dialysis (CAPD)

Continuous ambulatory peritoneal dialysis (CAPD) is done to remove wastes, chemicals, and extra fluid from your body. During CAPD, a liquid called dialysate is put into your abdomen through a catheter (thin tube).

Peritoneal dialysis may be the better option if you: Extensive surgical scars in your abdomen A large area of weakened abdominal muscle hernia Limited ability to care for yourself, or a lack of caregiving support Inflammatory bowel disease or frequent bouts of diverticulitis Protein malnutrition Critical illness Most people who start dialysis with peritoneal dialysis will eventually experience a decline in kidney function and will need hemodialysis or kidney transplant. Risks Complications of peritoneal dialysis can include: An infection of the abdominal lining peritonitis is a common complication of peritoneal dialysis. An infection can also develop at the site where the catheter is inserted to carry the cleansing fluid dialysate into and out of your abdomen. The dialysate contains sugar dextrose. Absorbing some of the dialysate might cause you to take in several hundred extra calories a day, leading to weight gain. The extra calories can also cause high blood sugar, especially if you have diabetes. Holding fluid in your abdomen for long periods may strain your muscles. Peritoneal dialysis can become ineffective after several years. You might need to switch to hemodialysis. Certain prescription and over-the-counter medications that can damage your kidneys, including nonsteroidal anti-inflammatory drugs. Soaking in a bath or hot tub, or swimming in a lake, pond, river or nonchlorinated pool " which increases the risk of infection. Showers and swimming in a chlorinated pool are generally acceptable. The insertion might be done under local or general anesthesia. The tube is usually inserted near your bellybutton. After the tube is inserted, your doctor will probably recommend waiting at least two weeks before starting peritoneal dialysis treatments to give the catheter site time to heal. Complete healing of the catheter site can take up to two months. What you can expect During peritoneal dialysis: The dialysate flows into your abdomen and stays there for a prescribed period of time dwell time " usually four to six hours Dextrose in the dialysate helps filter waste, chemicals and extra fluid in your blood from tiny blood vessels capillaries in the lining of your abdominal cavity peritoneum When the dwell time is over, the solution " along with waste products drawn from your blood " drains into a sterile collection bag The process of filling and then draining your abdomen is called an exchange. Different methods of peritoneal dialysis have different schedules of exchange. The two main schedules are: Gravity moves the fluid through the catheter and into and out of your abdomen. The cyclor automatically fills your abdomen with dialysate, allows it to dwell there and then drains it to a sterile bag that you empty in the morning. You must remain attached to the machine for 10 to 12 hours at night. But in the morning you begin one exchange with a dwell time that lasts the entire day. You might have a lower risk of peritonitis because you connect and disconnect to the dialysis equipment less frequently than you do with CAPD. Your doctor might suggest certain modifications to individualize your program. Results Many factors affect how well peritoneal dialysis works in removing wastes and extra fluid from your blood. Your size How quickly your peritoneum filters waste How much dialysis solution you use The number of daily exchanges Length of dwell times The concentration of sugar in the dialysis solution To check if your dialysis is removing enough waste products, your doctor is likely to recommend: Peritoneal equilibration test PET. This test compares samples of your blood and your dialysis solution during an exchange. The results indicate whether waste toxins pass quickly or slowly from your blood into the dialysate. That information helps determine whether your dialysis would be improved if the solution stayed in your abdomen for a shorter or longer time. A blood sample and a sample of used dialysis solution are analyzed to determine how much of a certain waste product urea is being removed from your blood during dialysis. If you still produce urine, your doctor may also take a urine sample to measure its urea concentration. If the test results show that your dialysis schedule is not removing enough wastes, your doctor might change your dialysis routine to: Increase the number of exchanges Increase the amount of dialysate you use for each exchange Use a dialysate with a higher concentration of dextrose You can improve your dialysis results and your overall health by eating the right foods, including foods low in sodium and phosphorus. A dietitian can help you develop an individualized meal plan based on your weight; your personal preferences;

and your remaining kidney function and other medical conditions, such as diabetes or high blood pressure. Taking your medications as prescribed also is important for getting the best possible results. See the stories of satisfied Mayo Clinic patients.

2: Peritoneal dialysis - Mayo Clinic

This process, repeated several times a day, can effectively replace kidney function and - because it is a continuous process which allows you to carry on with normal activities - it is known as continuous ambulatory peritoneal dialysis (CAPD).

What is continuous ambulatory peritoneal dialysis? Continuous ambulatory peritoneal dialysis CAPD is done to remove wastes, chemicals, and extra fluid from your body. During CAPD, a liquid called dialysate is put into your abdomen through a catheter thin tube. The dialysate pulls wastes, chemicals, and extra fluid from your blood through the peritoneum. The peritoneum is a thin lining on the inside of your abdomen. The peritoneum works like a filter as the wastes are pulled through it. The process of filling and emptying your abdomen with dialysate is called an exchange. Exchanges may be done 3 to 5 times during the day, and once during the night. You may need CAPD if your kidneys are not working well, or if they have stopped working. Your kidneys remove wastes and extra fluid from your blood and leave your body through your urine. When your kidneys are damaged, they cannot remove wastes properly. This can cause serious problems in your body. You may need CAPD if you have acute short-term or chronic long-term kidney failure. During acute kidney failure, you may only need CAPD until your kidneys get better. If you have chronic kidney failure, you will need to have dialysis exchanges for the rest of your life. How is a CAPD catheter put in? A procedure will be done to place the catheter. Medicine will be given to make you relax and decrease pain. Your healthcare provider will make an incision below or beside your belly button, or just below your ribs. He will cut through your muscle and tissue to make a hole where the catheter will be placed. A catheter will be pushed into your abdomen through this hole. The end of the catheter may be placed just under your skin for 3 to 5 weeks. Your healthcare provider will put some liquid through the catheter to check that it works well. He may also put blood thinner medicine in it to help prevent your catheter from getting clogged. The catheter will be held in place with stitches, and the area covered with bandages. How are CAPD exchanges done? CAPD exchanges should be done in a well-lit room. There should be no pets, dander, strong breezes, or fans in the room. They can increase your risk of an infection. Place the following supplies on a clean table close to where you will be doing your CAPD exchange: Dialysate bag and waste product bag Y-shaped tubing IV stand used to hang your dialysate bag Disposable medical gloves Medical mask to wear over your face during CAPD Tubing clamps New plastic syringe without a needle if needed Wash your hands with soap and water. Rub your hands together with soap for at least 15 seconds before rinsing them. Dry your hands with a clean towel or paper towel. Do not touch the tubing or catheter without washing your hands and wearing gloves. Keep your fingernails short and clean. Put on your gloves and mask. Put your mask on so that it covers your mouth and nose. Do not touch anything but the catheter and your supplies after you put the gloves on. Flush the tubing with dialysate liquid before your exchange to help prevent infections. Connect the lower end of the Y tubing to your catheter, and connect the 2 other ends of the tubing to the dialysate bag and the waste bag. Clamp the tubing that is attached to the catheter that goes into your abdomen. This will close off the tubing so that the dialysate does not go into your abdomen yet. Allow milliliters mL of fresh dialysate to flow out of the bag, and down the tubing into the waste bag. After mL of dialysate has drained, clamp the tubing that goes to the waste bag. Let the dialysate flow into your abdomen. Hang the bag at a higher level than your abdomen. Take the clamp off of the tubing that is attached to the catheter that goes into your abdomen. Let the rest of the dialysate flow into your abdomen. This should take no more than 10 minutes. You may lie down, sit, or stand up while the dialysate flows in. After all of the dialysate is in your abdomen, wash your hands and put on new gloves. Disconnect your catheter from the tubing. Clamp your catheter closed. Leave the dialysate in your abdomen for 3 to 5 hours of dwell time. Drain the dialysate out of your abdomen, and into the waste bag. After the dwell time, follow the steps of washing your hands and putting on your mask. Be sure the supplies that you need are easy to reach and use. Connect the Y tubing to your catheter again. Do this in the same way as you did to put the dialysate into your abdomen. Clamp the tubing that goes to the dialysate bag so that it is closed. Hang the bag at a lower level than your abdomen. Remove the clamps from the tubing that leads to the waste

bag. Let the dialysate drain from your abdomen into the waste bag. If the dialysate is not flowing out well, change your body position. If this does not make the dialysate flow out better, disconnect the end of the tubing that is attached to your catheter. Use a syringe to gently suck the dialysate out of your abdomen. It should take less than 45 minutes to drain the dialysate out of your abdomen. The dialysate that drains out should be clear. After all the dialysate has drained out, close the waste bag and dispose of it as directed.

What is automated peritoneal dialysis? Automated peritoneal dialysis APD is a type of dialysis that uses a machine called a cyclor. It puts the dialysate in your abdomen and drains it out after the exchange is complete. You may do 1 exchange that lets the dialysate dwell in your abdomen during the day. At night, you can connect your catheter to the cyclor to drain it. Peritoneal dialysis exchanges will also be done while you sleep. If you sleep for 8 to 9 hours, the machine may do 3 to 5 exchanges during that time. With APD, you do not need to stop what you are doing during the day to do an exchange. Ask your healthcare provider for more information about APD.

Do I need to follow a special diet? You will have to limit phosphorus and sodium salt. You may need to decrease or increase potassium, depending on your blood levels. You will also need extra protein, because protein is lost through your exchanges. The dialysate contains sugar, which may cause you to gain weight. Your dietitian may want you to decrease the amount of calories you have each day if you gain weight. You may also need to limit liquid if your body is retaining holding in fluid. Your healthcare provider will tell you how much liquid to drink each day. Write down how much liquid you drink each day. Measure the amount of urine you pass each time you go to the bathroom. Your healthcare provider may ask you to weigh yourself each day. Show this information to your healthcare provider when you have follow-up visits. He will tell you if you have too much or too little fluid in your body, and what to do to correct it.

When should I contact my healthcare provider? Pus or fluid is draining out of the exit site. The dialysate that drains out of your abdomen looks cloudy. The exit site is bigger than it used to be. Dialysate is not flowing out of your abdomen during an exchange, even after you change position and use a syringe. You have a fever or chills. You have dull pain in your abdomen while you do a dialysis exchange. A new bump has grown in your abdomen since you started doing CAPD exchanges.

3: Continuous Ambulatory Peritoneal Dialysis - What You Need to Know

Peritoneal dialysis (PD) is a type of dialysis which uses the peritoneum in a person's abdomen as the membrane through which fluid and dissolved substances are exchanged with the blood.

How will I know if my peritoneal dialysis is working? What is peritoneal dialysis and how does it work? Peritoneal dialysis is a treatment for kidney failure that uses the lining of your abdomen, or belly, to filter your blood inside your body. Health care providers call this lining the peritoneum. A few weeks before you start peritoneal dialysis, a surgeon places a soft tube, called a catheter, in your belly. When you start treatment, dialysis solution—water with salt and other additives—flows from a bag through the catheter into your belly. When the bag is empty, you disconnect it and place a cap on your catheter so you can move around and do your normal activities. While the dialysis solution is inside your belly, it absorbs wastes and extra fluid from your body. Peritoneal dialysis After a few hours, the solution and the wastes are drained out of your belly into the empty bag. You can throw away the used solution in a toilet or tub. Then, you start over with a fresh bag of dialysis solution. When the solution is fresh, it absorbs wastes quickly. As time passes, filtering slows. For this reason, you need to repeat the process of emptying the used solution and refilling your belly with fresh solution four to six times every day. This process is called an exchange. You can do your exchanges during the day, or at night using a machine that pumps the fluid in and out. For the best results, it is important that you perform all of your exchanges as prescribed. Dialysis can help you feel better and live longer, but it is not a cure for kidney failure. How will I feel when the dialysis solution is inside my belly? You may feel the same as usual, or you may feel full or bloated. Your belly may enlarge a little. Some people need a larger size of clothing. Most people look and feel normal despite a belly full of solution. What are the types of peritoneal dialysis? You can choose the type of peritoneal dialysis that best fits your life: You do the exchanges during the day by hand. You can do exchanges by hand in any clean, well-lit place. Each exchange takes about 30 to 40 minutes. During an exchange, you can read, talk, watch television, or sleep. With CAPD, you keep the solution in your belly for 4 to 6 hours or more. The time that the dialysis solution is in your belly is called the dwell time. Usually, you change the solution at least four times a day and sleep with solution in your belly at night. You do not have to wake up at night to do an exchange. A machine does the exchanges while you sleep. With automated peritoneal dialysis, a machine called a cycler fills and empties your belly three to five times during the night. In the morning, you begin the day with fresh solution in your belly. You may leave this solution in your belly all day or do one exchange in the middle of the afternoon without the machine. People sometimes call this treatment continuous cycler-assisted peritoneal dialysis or CCPD. Where can I do peritoneal dialysis? You can do both CAPD and automated peritoneal dialysis in any clean, private place, including at home, at work, or when travelling. How do I prepare for peritoneal dialysis? Surgery to put in your catheter Before your first treatment, you will have surgery to place a catheter into your belly. Planning your catheter placement at least 3 weeks before your first exchange can improve treatment success. Your surgeon will make a small cut, often below and a little to the side of your belly button, and then guide the catheter through the slit into your peritoneal cavity. However, most people can go home after the procedure. Dialysis training After training, most people can perform both types of peritoneal dialysis on their own. Most people bring a family member or friend to training. A dialysis nurse will make sure you know how to perform your dialysis. How do I perform an exchange? Your health care team will provide everything you need to begin peritoneal dialysis and help you arrange to have supplies such as dialysis solution and surgical masks delivered to your home, usually once a month. Careful hand washing before and wearing a surgical mask over your nose and mouth while you connect your catheter to the transfer set can help prevent infection. Use a transfer set to connect your catheter to the dialysis solution A transfer set is tubing that you use to connect your catheter to the bag of dialysis solution. When you first get your catheter, the section of tube that sticks out from your skin will have a secure cap on the end to prevent infection. A connector under the cap will attach to any type of transfer set. You connect your catheter to the transfer set to do your exchange. Between exchanges, you can keep your catheter and transfer set hidden inside your clothing. One branch of the Y-tube

connects to the drain bag, while the other connects to the bag of fresh dialysis solution. Use dialysis solution as prescribed. Dialysis solution comes in 1. Solutions contain a sugar called dextrose or a compound called icodextrin and minerals to pull the wastes and extra fluid from your blood into your belly. Different solutions have different strengths of dextrose or icodextrin. Your doctor will prescribe a formula that fits your needs.

Doing an exchange by hand After you wash your hands and put on your surgical mask, drain the used dialysis solution from your belly into the drain bag. Near the end of the drain, you may feel a mild tugging sensation that tells you most of the fluid is gone. Close the transfer set. Warm each bag of solution to body temperature before use. You can use an electric blanket, or let the bag sit in a tub of warm water. Most solution bags come in a protective outer wrapper, and you can warm them in a microwave. Hang the new bag of solution on a pole and connect it to the tubing. Remove air from the tubes—allow a small amount of fresh, warm solution to flow directly from the new bag of solution into the drain bag. Clamp the tube that goes to the drain bag. Open or reconnect the transfer set, and refill your belly with fresh dialysis solution from the hanging bag. Using a cycler for automated peritoneal dialysis exchanges

In automated peritoneal dialysis, you use a machine called a cycler to fill and drain your belly. You can program the cycler to give you different amounts of dialysis solution at different times. Each evening, you set up the machine to do three to five exchanges for you. You connect three to five bags of dialysis solution to tubing that goes into the cycler—one bag of solution for each exchange. The machine may have a special tube to connect the bag for the last exchange of the night. Automated peritoneal dialysis uses a machine called a cycler to fill and empty your belly three to five times during the night while you sleep. At the times you set, the cycler releases a clamp and allows used solution to drain out of your belly into the drain line. It warms the fresh dialysis solution before it enters your body, releases a clamp to allow body-temperature solution to flow into your belly. A fluid meter in the cycler measures and records how much solution the cycler removes. Some cyclers compare the amount that was put in with the amount that drains out. This feature lets you and your doctor know if the treatment is removing enough fluid from your body. Some cyclers allow you to use a long drain line that drains directly into your toilet or bathtub. Others have a disposal container. You can drain the used dialysis solution directly into your toilet.

What changes will I have to make when I start peritoneal dialysis?

Daily routine Your schedule will change as you work your dialysis exchanges into your routine. If you do CAPD during the day, you have some control over when you do the exchanges.

Physical activity You may need to limit some physical activities when your belly is full of dialysis solution. You may still be active and play sports, but you should discuss your activities with your health care team.

4: Peritoneal Dialysis | NIDDK

Continuous Ambulatory Peritoneal Dialysis (CAPD) Automated Peritoneal Dialysis (APD) The basic treatment is the same for each. However, the number of treatments and.

Both options remove extra fluid and molecules that gather inside the body when the kidney fails. Overall, PD is more flexible and convenient. It can be done at your own home and does not require visits per week to a dialysis center as seen with HD. PD requires you and a family member to learn the process and work closely with your dialysis team and nephrologist. Before you begin PD, a surgeon will insert a soft catheter through the skin that passes into a layer of the stomach called peritoneum. This layer acts as a thin layer of tissue that allows exchange of fluid, electrolytes and harmful substances between blood and a sugar containing fluid placed inside the stomach through the catheter. The waste products collected in the peritoneal cavity can then be drained. A typical PD prescription will include both and requires exchanges per day with a dwell time of hours per exchange. During the dwells you will be able to perform every day activities with the exception of contact sports. Before you begin PD, you will receive enough training to allow you to fill and drain dialysate through the catheter at home. There are 2 types of PD: Depending on the type of PD you choose you will do many exchanges throughout the day or a few exchanges at night. You do not need a machine if you choose this type of PD. You will fill your stomach with dialysate and drain it out after hours with gravity. CAPD involves several exchanges during the course of each day and this may not be convenient for people who work during the day. No matter the type of PD a patient chooses, all patients are trained in CAPD in case of power outages and emergencies. This type of PD requires a machine that does exchanges for you while you sleep at night. It includes the same number of exchanges as CAPD, but shorter dwell times. In the morning, you fill your stomach and the dialysate remains in the stomach for the entire day, which will be your longest dwell time. But, there are some features, which can help you, decide which type of PD suites you. A major complication associated with PD is introduction of harmful bacteria into the peritoneal cavity, called peritonitis. This complication can lead to significant suffering and is a common reason for failure of PD. Comparison of infectious complications in peritoneal dialysis patients using either a twin-bag system or automated peritoneal dialysis. Nephrol Dial Transplant; Clinical efficacy and morbidity associated with continuous cyclic compared with continuous ambulatory peritoneal dialysis. Ann Intern Med; A comparative analysis on the incidence of peritonitis and exit-site infection in CAPD and automated peritoneal dialysis. Perit Dial Int; Liakopoulos V, Dombros N. Patient selection for automated peritoneal dialysis: Perit Dial Int ; 29 Suppl 2: The outcomes of continuous ambulatory and automated peritoneal dialysis are similar. Kidney Int ;

5: Continuous Ambulatory Peritoneal Dialysis (CAPD) | Live Now

Unlike HHD, however, which uses an external machine with a dialysis filter to clean your blood, PD uses your body's abdominal lining, the peritoneal membrane, as a natural filter and filters your blood continuously throughout the day.

Drainage Continuous Ambulatory Peritoneal Dialysis CAPD The abdomen is cleaned in preparation for surgery and a catheter is surgically inserted with one end in the abdomen and the other protruding from the skin. The dwell can be as much as 3 liters, and medication can also be added to the fluid immediately before infusion. After a variable period of time depending on the treatment usually 4–6 hours [17], the fluid is removed and replaced with fresh fluid. This can occur automatically while the patient is sleeping automated peritoneal dialysis, APD, or during the day by keeping two litres of fluid in the abdomen at all times, exchanging the fluids four to six times per day continuous ambulatory peritoneal dialysis, CAPD. The amount of dialysis that occurs depends on the volume of the dwell, the regularity of the exchange and the concentration of the fluid. APD cycles between 3 and 10 dwells per night, while CAPD involves four dwells per day of liters per dwell, with each remaining in the abdomen for 4–8 hours. The viscera accounts for roughly four-fifths of the total surface area of the membrane, but the parietal peritoneum is the most important of the two portions for PD. The high concentration of glucose drives the filtration of fluid by osmosis osmotic UF from the peritoneal capillaries to the peritoneal cavity. Glucose diffuses rather rapidly from the dialysate to the blood capillaries. After h of the dwell, the glucose osmotic gradient usually becomes too low to allow for further osmotic UF. Therefore, the dialysate will now be reabsorbed from the peritoneal cavity to the capillaries by means of the plasma colloid osmotic pressure, which exceeds the colloid osmotic pressure in the peritoneum by approximately mmHg cf. Patients with a high water permeability UF-coefficient of the peritoneal membrane can have an increased reabsorption rate of fluid from the peritoneum by the end of the dwell. The ability to exchange small solutes and fluid in-between the peritoneum and the plasma can be classified as high fast, low slow or intermediate. High transporters tend to diffuse substances well easily exchanging small molecules between blood and the dialysis fluid, with somewhat improved results with frequent, short-duration dwells such as with APD, while low transporters have a higher UF due to the slower reabsorption of glucose from the peritoneal cavity, which results in somewhat better results with long-term, high-volume dwells, though in practice either type of transporter can generally be managed through the appropriate use of either APD or CAPD. Excessive loss of fluid can result in hypovolemic shock or hypotension while excessive fluid retention can result in hypertension and edema. Also monitored is the color of the fluid removed: The presence of pink or bloody effluent suggests bleeding inside the abdomen while feces indicates a perforated bowel and cloudy fluid suggests infection. The patient may also experience pain or discomfort if the dialysate is too acidic, too cold or introduced too quickly, while diffuse pain with cloudy discharge may indicate an infection. Severe pain in the rectum or perineum can be the result of an improperly placed catheter. The dwell can also increase pressure on the diaphragm causing impaired breathing, and constipation can interfere with the ability of fluid to flow through the catheter. The acidity, high concentration and presence of lactate and products of the degradation of glucose in the solution particularly the latter may contribute to these health issues. Solutions that are neutral, use bicarbonate instead of lactate and have few glucose degradation products may offer more health benefits though this has not yet been studied.

6: Continuous Ambulatory Peritoneal Dialysis (CAPD)

Kidney Diseases Peritoneal Dialysis - Continuous Ambulatory Peritoneal Dialysis (CAPD) Dialysis is a process by which waste products are removed from the blood and excess fluid is removed from the body.

Continuous ambulatory peritoneal dialysis CAPD is done to remove wastes, chemicals, and extra fluid from your body. During CAPD, a liquid called dialysate is put into your abdomen through a catheter thin tube. A procedure will be done to place this catheter. The dialysate pulls wastes, chemicals, and extra fluid from your blood through the peritoneum. The peritoneum is a thin lining on the inside of your abdomen. The peritoneum works like a filter as the wastes are pulled through it. The process of filling and emptying your abdomen with dialysate is called an exchange. You may be given medicine to lower your blood pressure or antibiotics for an infection caused by bacteria. Your healthcare provider or nephrologist may also recommend that you take vitamins and minerals. Vitamins are removed from your body during CAPD exchanges. It may be hard to eat and drink enough to get all the vitamins your body needs. You may need to take iron and folic acid. These medicines help your body make more red blood cells, which can give you more energy. Take your medicine as directed. Contact your healthcare provider or nephrologist if you think your medicine is not helping or you have side effects. Tell him if you are allergic to any medicine. Keep a list of the medicines, vitamins, and herbs you take. Include the amounts, and when and why you take them. Bring the list or the pill bottles to follow-up visits. Carry your medicine list with you in case of an emergency. Follow up with your healthcare provider or nephrologist as directed: Write down your questions so you remember to ask them during your visits. How to do a CAPD exchange: You may need to wait 14 days or longer after your CAPD catheter has been placed before you can use it. This should give your exit site time to heal. Your healthcare provider will tell you when it is okay to use your catheter. CAPD exchanges may be done 3 to 5 times during the day, and once during the night. CAPD exchanges should be done in a well-lit room. There should be no pets, dander, strong breezes, or fans in the room. They can increase your risk of an infection. Place the following supplies on a clean table close to where you will be doing your CAPD exchange: Dialysate bag and waste product bag Y-shaped tubing IV stand used to hang your dialysate bag Disposable medical gloves Medical mask to wear over your face during CAPD Tubing clamps New plastic syringe without a needle if needed Wash your hands with soap and water. Rub your hands together with soap for at least 15 seconds before rinsing them. Dry your hands with a clean towel or paper towel. Do not touch the tubing or catheter without washing your hands and wearing gloves. Keep your fingernails short and clean. Put on your gloves and mask. Put your mask on so that it covers your mouth and nose. Do not touch anything but the catheter and your supplies after you put the gloves on. Flush the tubing with dialysate liquid before your exchange to help prevent infections. Connect the lower end of the Y tubing to your catheter, and connect the 2 other ends of the tubing to the dialysate bag and the waste bag. Clamp the tubing that is attached to the catheter that goes into your abdomen. This will close off the tubing so that the dialysate does not go into your abdomen yet. Allow milliliters mL of fresh dialysate to flow out of the bag, and down the tubing into the waste bag. After mL of dialysate has drained, clamp the tubing that goes to the waste bag. Let the dialysate flow into your abdomen. Hang the bag at a higher level than your abdomen. Take the clamp off of the tubing that is attached to the catheter that goes into your abdomen. Let the rest of the dialysate flow into your abdomen. This should take no more than 10 minutes. You may lie down, sit, or stand up while the dialysate flows in. After all of the dialysate is in your abdomen, wash your hands and put on new gloves. Disconnect your catheter from the tubing. Clamp your catheter closed. Leave the dialysate in your abdomen for 3 to 5 hours of dwell time. Drain the dialysate out of your abdomen, and into the waste bag. After the dwell time, follow the steps of washing your hands and putting on your mask. Be sure the supplies that you need are easy to reach and use. Connect the Y tubing to your catheter again. Do this in the same way as you did to put the dialysate into your abdomen. Clamp the tubing that goes to the dialysate bag so that it is closed. Hang the bag at a lower level than your abdomen. Remove the clamps from the tubing that leads to the waste bag. Let the dialysate drain from your abdomen into the waste bag. If the dialysate is not flowing out well, change your body position. If this does not make the dialysate flow out

better, disconnect the end of the tubing that is attached to your catheter. Use a syringe to gently suck the dialysate out of your abdomen. It should take less than 45 minutes to drain the dialysate out of your abdomen. The dialysate that drains out should be clear. After all the dialysate has drained out, close the waste bag and dispose of it as directed. You will have to limit phosphorus and sodium salt. You may need to decrease or increase potassium, depending on your blood levels. You will also need extra protein, because protein is lost through your exchanges. The dialysate contains sugar, which may cause you to gain weight. Your dietitian may want you to decrease the amount of calories you have each day if you gain weight. You may also need to limit liquid if your body is retaining holding in fluid. Your healthcare provider will tell you how much to drink each day. Write down how much liquid you drink each day. Measure the amount of urine you pass each time you go to the bathroom. Your healthcare provider may ask you to weigh yourself each day. Show this information to your healthcare provider when you have follow-up visits. He will tell you if you have too much or too little fluid in your body, and what to do to correct it. Contact your healthcare provider or nephrologist if:

- Pus or fluid is draining out of the exit site.
- The dialysate that drains out of your abdomen looks cloudy.
- The exit site is bigger than it used to be.
- No dialysate is flowing out of your abdomen during an exchange, even after you change positions and use a syringe.
- You have a fever or chills.
- You have dull pain in your abdomen while you do a dialysis exchange.
- A new bump has grown in your abdomen since you started doing CAPD exchanges.
- Your catheter exit site is red, tender, or painful.
- You have questions or concerns about your condition or care.

Seek care immediately or call if:

- You have stomach pain and are vomiting.
- You have trouble breathing while you do your exchanges.
- Your catheter has a crack or hole in it, or it has come part or all of the way out of your abdomen.

It is not intended as medical advice for individual conditions or treatments. Talk to your doctor, nurse or pharmacist before following any medical regimen to see if it is safe and effective for you. Further information Always consult your healthcare provider to ensure the information displayed on this page applies to your personal circumstances.

7: Peritoneal dialysis - Wikipedia

What is peritoneal dialysis and how does it work? Peritoneal dialysis is a treatment for kidney failure that uses the lining of your abdomen, or belly, to filter your blood inside your body. Health care providers call this lining the peritoneum. A few weeks before you start peritoneal dialysis, a

PD Is An Option: Both therapies can be performed wherever you and your healthcare team feel is right for you. The peritoneal membrane is the lining that surrounds the peritoneal cavity, which is in your abdomen and contains your stomach, spleen, liver, and intestines. During the PD process usually called an exchange , a solution is placed in the peritoneum through a catheter and the peritoneal membrane acts as a filter and draws waste and fluids from your blood into the solution. APD is good for people who want more freedom from dialysis during the day. Since you may not have to do exchanges during the day, APD can help you have flexibility with your daytime routine. And you can walk around, even during exchanges. Exchanges usually take about 30 minutes, commonly 4 times a day and only require a solution bag with tubing attached to it that connects to your catheter. The fluid from the solution bag "dwells" in your abdomen for about hours, drawing waste products and excess fluid from the bloodstream. An exchange can be performed in any clean area - at home, work or while traveling. It also offers a more flexible lifestyle and allows you to maintain your independence. You can even do your therapy overnight while you sleep. If you still have some residual kidney function and are interested in a kidney transplant, PD may be a good option. In fact, PD patients have been shown to be more likely to have a transplant when compared to HD patients³. PD helps preserve access to your veins It may happen that over a number of years on dialysis, you may need to use multiple types of therapy. Because PD is administered through a catheter in your abdominal cavity, your veins are not involved in the therapy and the integrity of the veins can be preserved. PD requires training and space in your home With PD, you have to be responsible to do your treatment every day as you were trained. PD patients must maintain a clean environment according to how they were trained by their PD nurse and need space in the home for dialysis supplies. Is PD right for you? Several conditions may prevent your doctor from prescribing PD, including previous abdominal surgeries or the presence of intestinal diseases, such as inflammatory bowel disease or diverticulitis. Risks of PD include peritonitis or exit-site infections. Glucose found in the PD solution may lead to high blood sugar in patients with diabetes. Every patient is different, so it is important to talk to your doctor, nurse or social worker to determine if there are other reasons why PD may not be right for you. J Am Soc Nephrol. Renae, Grandmother, Jail Sergeant.

8: Continuous ambulatory peritoneal dialysis – a guide to imaging appearances and complications

continuous ambulatory peritoneal dialysis (CAPD) peritoneal dialysis involving the continuous presence of dialysis solution in the peritoneal cavity; see discussion at peritoneal dialysis. continuous cycling peritoneal dialysis (CCPD) a procedure similar to continuous ambulatory peritoneal dialysis.

Continuous ambulatory peritoneal dialysis Summary These pages explain how continuous ambulatory peritoneal dialysis CAPD works and offer practical information as well as links to more resources. What is peritoneal dialysis? The principal role of the kidneys is the filtration and removal of waste products and excess fluid from the blood. Dialysis is a way of replacing kidney function in people whose kidneys have failed. There are two main forms of dialysis: The abdomen is lined by a thin membrane called the peritoneum, which has a rich supply of tiny blood vessels capillaries. If the peritoneal membrane is bathed in fluid, waste products can pass from the capillary blood vessels into that fluid, which removes them from the blood. During peritoneal dialysis, fluid is drained into the peritoneal cavity, allowed to sit there for several hours whilst it absorbs waste products, and then drained out. This process, repeated several times a day, can effectively replace kidney function and - because it is a continuous process which allows you to carry on with normal activities - it is known as continuous ambulatory peritoneal dialysis CAPD. How does CAPD work? A permanent soft flexible plastic tube catheter is inserted in the abdomen under local or general anaesthetic. You may be required to stay in hospital for hours following this procedure and may have some dialysis during your stay. The exit site dressing will need to be changed regularly. Two or three weeks later, the catheter will be ready for use and CAPD can commence. One to three litres of dialysis fluid are run via the catheter into the peritoneal cavity Figure 1 , and remain in the cavity for several hours before being drained out into an empty bag by gravity. This is called an exchange procedure. The waste products normally removed by the kidney are contained in the drained fluid, which is disposed of into the toilet. A new bag of fluid is then drained into the peritoneal cavity. The exchange procedure is usually performed four times a day, every day, and takes about minutes. You will be taught how to perform the exchange procedure and how to cope with any problems. The training usually takes several days, during which the nurse will use a variety of teaching aids which may include videos, computer programs and practice equipment. Information will be available in some foreign languages if needed and teaching material has also been adapted for blind or disabled patients. How will I feel? It is sometimes difficult to cope with learning that you need dialysis and getting to grips with CAPD, which can appear complicated and time-consuming. The changes can play havoc with your situation at home and at work, as well as with your emotions. Initially, as well as feeling physically unwell, many patients feel bad tempered, depressed, angry or frightened. Try not to bottle up your feelings; it is better for your peace of mind to talk to someone about what is happening. Finding out more about your condition and treatment can relieve fears too, and sharing your feelings may help. You will be visited at home by a Community Dialysis Sister who is there to listen to your worries as well as to help you with the practical side of dialysis. You can also talk to your doctor or nurse at the CAPD clinic. Are there any problems with CAPD? The most common complication is infection peritonitis or infection of the exit site. It is important to try to avoid infection by following the exchange procedure and exit site care as it is taught to you during your CAPD training. If these problems occur, you must contact the CAPD unit straightaway. The sooner the infection is treated, the less likely it is to affect your CAPD or require your admission to hospital. Where will I do it at home? You do not need a special room at home for CAPD, although it must be done in a clean environment. A lot of patients use their own bedrooms, although you will need to wash your hands before you do an exchange so it is better if your room is located near the bathroom or a wash basin. There should not be people passing through the room at the time of doing the exchange and all windows should be closed and your pets kept out. Do I need to provide any equipment? You will require the following: All the dialysis fluid, lines and equipment for exit site care and washing your hands will be delivered to your home every month. You will be taught how to work out what you need to order. This procedure is very simple. You will know in advance when the supplies are to be delivered so that you can make arrangements if you will not be at home. Where will I store my supplies?

Supplies can be stored almost anywhere – in your bedroom, under the stairs, in cupboards, in the cellar, in the garage, etc. CAPD patients are encouraged, if fit, to return to work. Those needing to do an exchange at lunch time will be given advice on how this can be achieved in a work situation. A member of the community nursing team will give your employer some information about dialysis and, if necessary, visit your place of work to discuss CAPD and offer advice. Most employers are very helpful and will allow extra time off or provide a suitable room in which to do an exchange. Heavy lifting is not permitted while on CAPD, so it may be necessary for you to do lighter duties if your work entails this. Can I go on holiday? An exchange can be performed in any clean location, so that you can visit your family and friends and go on holiday. Your boxes of dialysis fluid can be delivered to your holiday destination, almost anywhere in the world, but some advance notice months will be required. You will be given some information booklets about holidays, and the dialysis administrator and your community nurse will help you order your supplies and advise on travel arrangements. Will I need a special diet? CAPD patients are allowed a fairly liberal diet. With CAPD, valuable proteins are lost in the fluid at each exchange, and these need to be replaced. Proteins are responsible for growth, building muscles and repairing tissues and you will be encouraged to eat high-quality protein such as meat, poultry, fish and eggs. Salt may be restricted as too much of it can make high blood pressure worse, and cause thirst and fluid retention. Salt at the table should be avoided and processed foods should be used sparingly. Foods containing potassium - such as bananas, oranges and chocolates - are allowed in moderation. Phosphate builds up in the body in renal failure and can cause bone problems. Phosphate is a mineral found in milk, cheese, liver, nuts and protein foods, but some of these foods are encouraged, so it is impossible to eliminate phosphate entirely. Phosphate-binding medications may therefore be necessary for you to take with your meals if the phosphate level in your blood remains high. If constipation occurs, it can affect your CAPD. You should include high-fibre foods in your diet such as bran, cereals and fresh fruit and vegetables. Fluid restriction may become necessary to maintain good fluid balance – the amount taken in must not exceed the amount put out in the form of urine and dialysis. The less urine you pass, the less fluid is usually allowed in your diet. Excess fluid in the body can cause heart problems and high blood pressure. The renal dietitian will advise you about diet at your clinic visits. What medicine will I need to take? Most patients on CAPD will need to take some of the following:

9: Peritoneal Dialysis

Continuous Ambulatory Peritoneal Dialysis (CAPD), performed times per day Continuous Cycling Peritoneal Dialysis (CCPD / APD), done automatically by the cyclor while you sleep at night. During Peritoneal Dialysis (PD), a clean bag of fluid called dialysate flows through a catheter into the abdominal cavity.

One way to remove these wastes is a process called peritoneal dialysis PD. The walls of the abdominal cavity are lined with a membrane called the peritoneum. These wastes then leave the body when the used solution is drained from the abdomen. Each cycle of draining and refilling is called an exchange. The time the solution remains in the abdomen between exchanges is called the dwell time. During this dwell time, some of the dextrose in the solution crosses the membrane and is absorbed by the body. Many factors affect how much waste and extra fluid are removed from the blood. Dialysis solution comes in 1. In some people, the peritoneum does not allow wastes to enter the dialysis solution efficiently enough to make PD feasible. Controllable factors include the number of daily exchanges and the dwell times. When fresh solution is first placed in the abdomen, it draws in wastes rapidly. As wastes fill the solution, it cleans the blood less efficiently. For example, a patient may perform one exchange with a 6-hour dwell time, during which the solution pulls in nearly as much urea as it can hold. But in the second half of that dwell time, urea is being removed from the blood very slowly. If the patient performed two exchanges with 3-hour dwell times instead, the amount of urea removed would be substantially greater than that removed in one 6-hour dwell time. Another way to increase the amount of fluid and waste drawn into the peritoneal cavity is to use dialysis solution with a higher concentration of dextrose. A higher dextrose concentration moves fluid and more wastes into the abdominal cavity, increasing both early and long-dwell exchange efficiency. Eventually, however, the body absorbs dextrose from the solution. As the concentration of dextrose in the body comes closer to that in the solution, dialysis becomes less effective, and fluid is slowly absorbed from the abdominal cavity.

Types of Peritoneal Dialysis The two types of peritoneal dialysis differ mainly in the schedule of exchanges. In continuous ambulatory peritoneal dialysis CAPD , the patient empties a fresh bag of dialysis solution into the abdomen. After 4 to 6 hours of dwell time, the patient returns the solution containing wastes to the bag. The patient then repeats the cycle with a fresh bag of solution. CAPD does not require a machine; the process uses gravity to fill and empty the abdomen. A typical prescription for CAPD requires three or four exchanges during the day and one long—usually 8 to 10 hours—overnight dwell time as the patient sleeps. The dialysis solution used for the overnight dwell time may have a higher concentration of dextrose so that it removes wastes and fluid for a longer time. Continuous ambulatory peritoneal dialysis CAPD is the most common form of peritoneal dialysis. To remove even more wastes, a mini-cycler machine can be used to exchange the dialysis solution once or several times overnight as the patient sleeps. Such additional exchanges may also help prevent the body from absorbing excessive amounts of dextrose and dialysis solution from the overnight dwell time. Continuous cycler-assisted peritoneal dialysis CCPD uses a machine to fill and empty the abdomen three to five times during the night while the person sleeps. In the morning, the last fill remains in the abdomen with a dwell time that lasts the entire day. Sometimes one additional exchange is done in the mid-afternoon to increase the amount of waste removed and to prevent excessive absorption of fluid. The dialysis solution used for the long daytime dwell may have a higher concentration of dextrose.

Testing for Efficiency The tests to see whether the exchanges are removing enough urea are especially important during the first weeks of dialysis, when the health care team needs to determine whether the patient is receiving an adequate amount, or dose, of dialysis. The peritoneal equilibration test—often called the PET—measures how much dextrose has been absorbed from a bag of infused dialysis solution and how much urea and creatinine have entered into the solution during a 4-hour dwell. The peritoneal transport rate varies from person to person. People who have a high rate of transport absorb dextrose from the dialysis solution quickly, and they should be given a dialysis schedule that avoids exchanges with a long dwell time because they tend to absorb too much dextrose and dialysis solution from such exchanges. In the clearance test, samples of used solution drained over a hour period are collected, and a blood sample is obtained during the day when the

solution is collected. The amount of urea in the solution is compared with the amount in the blood to see how effective the current PD schedule is in clearing the blood of urea. If the patient has more than a few ounces of urine output per day, the urine should also be collected during this period to measure its urea concentration. The residual clearance of the kidneys is also considered. Based on these measurements, one can determine whether the PD dose is adequate. If the laboratory results show that the dialysis schedule is not removing enough urea and creatinine, the doctor may change the prescription by increasing the number of exchanges per day for patients treated with CAPD or per night for patients treated with CCPD increasing the volume—amount of solution in the bag—of each exchange in CAPD adding an extra, automated middle-of-the-night exchange to the CAPD schedule adding an extra middle-of-the-day exchange to the CCPD schedule using a dialysis solution with a higher dextrose concentration Compliance One of the big problems with PD is that patients sometimes do not perform all of the exchanges recommended by their medical team. They either skip exchanges or sometimes skip entire treatment days when using CCPD. Skipping PD treatments has been shown to increase the risk of hospitalization and death. Residual Kidney Function Normally the PD prescription factors in the amount of residual kidney function. Residual function typically falls, although slowly, over the months or even years of treatment with PD. This means that, more often than not, the number of PD exchanges prescribed, or the volume of exchanges, needs to be increased as residual function falls. Health care providers should work closely with their patients to ensure that the proper PD dose is administered. To maximize health and prolong life, patients should follow instructions carefully to get the most out of their dialysis exchanges. What are clinical trials, and are they right for you? Clinical trials are part of clinical research and at the heart of all medical advances. Clinical trials look at new ways to prevent, detect, or treat disease. Researchers also use clinical trials to look at other aspects of care, such as improving the quality of life for people with chronic illnesses. Find out if clinical trials are right for you. What clinical trials are open? Clinical trials that are currently open and are recruiting can be viewed at www.clinicaltrials.gov.

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