

PERITONEAL DIALYSIS CHRONIC KIDNEY DISEASE



PERITONEAL DIALYSIS

You have been told that your kidneys do not work properly and that it is necessary for you to be treated with dialysis. This is when your kidney disease reaches Stage 5 (eGFR 15%).

There are two forms of dialysis treatment:

- Hemodialysis (HD)
- Peritoneal Dialysis (PD).

WHAT IS PERITONEAL DIALYSIS?

Peritoneal Dialysis (PD) is a treatment used to remove fluid and waste products (solutes) in your blood, which your kidneys are no longer able to do.

PD is usually performed by yourself in your own home.

You will need to think about whether you will be able to do your dialysis yourself. Also it is very important that your family or others close to you understand your situation and are willing to help you if necessary.

Your home must be big enough for storing all materials and you must have a clean place to do your exchanges (PD processes).

Before starting PD, your training nurse or social worker will usually come for a visit to discuss these issues with you.

PERITONEAL DIALYSIS

HOW DOES PD WORK?

Your stomach, intestines and the inside of your belly (the peritoneal cavity) are covered by a film which is called the peritoneal membrane. This peritoneal membrane is fairly large, about two square meters. In the membrane there are a lot of little blood vessels (same as in the kidneys) and therefore can work as a filter.

The PD process involves 3 phases:

1. **FILLING PHASE** - The dialysis solution contained in a clear and flexible plastic bag is connected into the peritoneal cavity through a catheter placed in your abdomen.
2. **DWELLING PHASE** - The infused solution is left for some time in the peritoneal cavity. During this period it is in contact with the peritoneal membrane. An interaction takes place between the dialysis solution and the little blood vessels in the peritoneal membrane: the dialysis solution (with glucose) 'draws' the excess fluid and waste products from your blood as it moves through the peritoneal membrane.

PERITONEAL DIALYSIS

3. **DRAINING PHASE** - When the dwell time is completed, this fluid with the dissolved substances is drained out of your abdomen into another bag, the drainage bag. After this, the process repeats with the filling of "fresh" dialysis solution.

This whole process of 3 phases is referred to as "an exchange".

There are two forms of Peritoneal Dialysis:

- Continuous Ambulatory Peritoneal Dialysis (CAPD)
- Automated Peritoneal Dialysis (APD).

CAPD

In CAPD you do the dialysis exchanges manually, usually 4 times a day. The last exchange is left to dwell overnight.

In CAPD the infusing and drainage of fluid through the peritoneal membrane will take place 24 hours a day.

Therefore, the word 'continuous' is used.

Since a machine is not used to do this procedure, you are able to move around and even go out. For this reason it is referred to as 'Ambulatory'.

PERITONEAL DIALYSIS

THE PROCEDURE

- Dialysis solution from a bag is infused into your peritoneal cavity through the catheter placed in your abdomen. There are different sort of bags for the dialysis fluid, depending on the delivering manufacturer and the type used in your dialysis centre. The bags are a double-bag system with one bag containing the fresh solution and the other for drainage of the fluid from the previous dwell phase.
- To do an exchange you will connect the double bag system to the catheter. The previous infused fluid is then removed from the peritoneal cavity by gravity into the drainage bag, which is placed on the floor. It usually takes about 10–20 minutes to drain the dialysed fluid from the peritoneal cavity.
- After drainage is completed you then infuse the "fresh" dialysis solution into your abdomen from another bag which is placed above your body. It usually takes about 10 minutes to infuse the 'fresh" solution. The amount of solution used for each exchange is usually 1.5 to 2 litres. The fresh solution is left to remain in the peritoneal cavity for some hours. After which the exchange will be repeated. You will need to do 3 to 5 exchanges per day. The exchanges can be done anywhere where you can ensure a clean environment; this is not restricted only to your home. Many people are able to complete their exchanges at work.

PERITONEAL DIALYSIS

The amount of fluid introduced will cause your abdomen to expand slightly. This means you may need to wear looser clothing for the exchange.

APD

In this form of PD the exchanges of solution will be done by a machine, known as "cycler", which is set to work automatically during the night while you sleep. This is why it is referred to as 'Automated Peritoneal Dialysis'.

THE PROCEDURE

- Before going to sleep you will set up the bags and lines to the "cycler" and connect your catheter to the appropriate line. During the night the machine performs all the dialysis exchanges itself. In the morning you disconnect your catheter from the machine and you throw the bag with the drained solution away. During the day you do not need to do exchanges.
- Most people are advised to leave a 'fresh' dialysis solution (500 -700ml) to remain in the peritoneal cavity after the machine has stopped. In this way some clearance (dialysis) will also take place during the day.

PERITONEAL DIALYSIS

HOW WILL YOU KNOW WHICH FORM OF PD IS FOR YOU?

In most centres you will be given the chance to choose between CAPD and APD.

You will be informed about the differences so that you and your family can make a decision as to which form of treatment is the most convenient for yourself and for your family. Talking to patients who have experienced each form of dialysis will be of help.

WHAT IS NEEDED BEFORE THE START OF PD?

In order that dialysis solution can access into the peritoneal cavity the surgeon places a catheter through your abdominal wall. This catheter can be used for both CAPD and APD.

The Tenckhoff catheter is most commonly used. It is made of synthetic material. The lower part of the catheter is placed in the peritoneal cavity while the middle part is placed close to the skin. The catheter has two 'cuffs' in the length to be placed inside the peritoneal cavity which help to anchor the catheter and prevent its movement. The place where the catheter comes out through the abdominal wall is called the exit site.

PERITONEAL DIALYSIS

The end of the catheter outside the abdomen will be fitted with a connecting piece made of titanium and a permanent “patient-line”, to which the lines of the exchange bags will be connected. In some cases the catheter will be visible through clothing.

HOW IS THE CATHETER PLACED?

You will be admitted to the hospital for a minor operation. The nurse or surgeon will discuss with you the place where the catheter will come out of your abdominal wall (the exit site), which will be marked on your skin before the operation.

Insertion of the catheter may be done under general anaesthesia or local anaesthesia. In both cases the surgeon will make as small an incision as possible. This process is not painful but the incision wound can cause slight pain when the effect of anaesthesia wears off (see below).

Before the operation, you will be prepared accordingly (e.g. fasting, bowel preparation and shower with chlorhexidine soap). You will be told to pass urine just before the procedure.

PERITONEAL DIALYSIS

WILL YOU EXPERIENCE PAIN?

After the operation you may feel some pain around the wound. The surgeon will usually prescribe painkiller. Do not hesitate to ask the nurse for this.

HOW LONG WILL YOU STAY IN THE HOSPITAL?

You will most likely stay in the hospital for about a day.

Your catheter will then be flushed to prevent blood clots and your wound will be dressed.

Before you go home the nurse will use a sterile technique to dress the exit site and the dressing will stay on the wound for about a week. You will be taught how to fasten the "patient-line" to your abdomen with an adhesive tape to prevent it pulling.

Usually after about two weeks (time needed for the wound to heal), you will go back to the hospital for your PD training.

PERITONEAL DIALYSIS

HOW WILL YOU BE TRAINED TO DO PD EXCHANGES?

About 2 weeks after the catheter operation you will be invited to the centre to start PD-training.

A PD nurse from your dialysis centre will train you and also, if desired, one or more family members.

The training for both CAPD and APD will usually cover the following issues:

- Overview of PD.
- How to monitor your weight and blood pressure (your dialysis centre doctor and nurse will help you to establish your targets).
- How to maintain proper hygiene, particularly correct hand-washing to do procedures in as clean as possible manner to avoid infection.
- How to do daily exit-site care.
- How to choose the correct bag solution (depending on your weight gain and blood pressure).
- How to do CAPD exchange or APD procedures (this depends on the version that you have chosen).

PERITONEAL DIALYSIS

- How to assess the fluid in the drainage bags to detect possible infection (peritonitis).
- How to keep records.
- How to order supplies.
- How to deal with complications and troubleshooting.
- Clinic visits/home visits.

In some centres other issues may also be addressed at a later stage, for example:

- Holiday protocols
- Employment/ hobbies/sports.

WHAT WILL HAPPEN AFTER YOU HAVE COMPLETED THE TRAINING?

After satisfactory training you will maintain contact with your centre on a regular basis. Your PD nurse will give you the instructions.

Your PD nurse will also check with you about any doubts or concern you may have in order to clarify them and/or to reinforce any training that you may need.

PERITONEAL DIALYSIS

The nurses in your centre will regularly ask you how you are feeling and if you have questions about the treatment. Sometimes they may ask you some questions relating to the topics covered in your training. The nurses want to be sure that your knowledge is sufficient to keep you safe and that you are satisfied with the treatment.

HOW DO YOU KNOW IF YOUR PD IS WORKING WELL?

To know if PD is working well, your peritoneal membrane will be controlled by testing the withdrawn fluid and waste products (PET test). This will be done on a regular basis.

WHAT ARE THE MOST COMMON COMPLICATIONS OF PD?

Just as in haemodialysis, PD can also cause problems. The most important problems related to PD are:

- **PERITONITIS** - this is an inflammation of the peritoneal cavity due to infection. Peritonitis can be easily treated with antibiotics, but in severe cases it can lead to hospitalisation, and even lead to the loss of the Tenckoff catheter.

PERITONEAL DIALYSIS

To prevent peritonitis it is important to follow the exchange procedure as you are taught. Also rigorous personal hygiene, scrupulous hand washing and disinfecting is important. Your training nurse will show you how to ensure this.

- **PROBLEMS WITH THE CATHETER** - the catheter may not work well because of a change of its position in the abdominal cavity. For example, the fluid runs in slower than it used to. To solve this problem, sometimes adopting another way of sitting or lying will help. If you are constipated, taking a laxative may help your bowels to work better.
- **PROBLEMS WITH THE EXIT SITE** - The exit site can become irritated, red and itchy. This is commonly due to movement of the catheter. A good and tight fastening of the catheter to the skin is important. To prevent irritation it sometimes can be necessary not to use any soap for cleaning the exit site. Irritation can be the start of an infection. Signs of infection are moisture or pus around the site. In this situation, it is necessary to contact your dialysis centre. An exit-site infection will be treated with antibiotics.
- **LEAKAGE** - In some cases some fluid runs out of the exit site. This is a signal that the abdominal wall has not yet fully closed around the catheter. You will need to report this to your PD nurse so that the correct actions will be taken.

PERITONEAL DIALYSIS

- **CHANGES OF THE PERITONEAL MEMBRANE** - Over the time your peritoneal membrane can change due to the exchanges with the dialysis fluid. As a result, less fluid and waste products will be removed from your blood by the dialysis exchanges. By regular testing of the withdrawn fluid and waste products (the so-called PET test), your dialysis centre can control the state of your peritoneal membrane in time.

WHAT ARE THE SIGNS AND SYMPTOMS OF PERITONITIS?

- Cloudy drained PD fluid
- Abdominal tenderness or pain
- Fever / chills
- Nausea / vomiting
- Constipation / diarrhoea.

PERITONEAL DIALYSIS

HOW DO YOU CHECK FOR PERITONITIS?

You should always inspect the fluid in the drainage bag. If the liquid drained into the drainage bag is cloudy, you must contact your dialysis centre at once, even if this is during the night. Do not throw the cloudy bag away, you will be asked to bring it with you to your centre. A sample of the cloudy fluid will be taken to the laboratory to be examined.

WHAT CAN YOU DO TO TAKE CARE OF YOURSELF AND YOUR CATHETER?

Regardless of whether you are on CAPD or APD, the following daily tasks are necessary:

- Check and record your blood pressure and your weight.
- Follow your PD prescription. Do three or four exchange procedures per day (CAPD) or set up and use your "cycler" (APD) every night.
- Care for your exit-site. Proper care of the catheter and the exit site is very important to prevent complications, particularly infection. You should follow the care guidelines given to you by your PD nurse.

PERITONEAL DIALYSIS

HOW DO YOU KNOW IF YOUR WEIGHT GAIN IS DUE TO EXCESS FLUID?

You will see swelling (oedema) around your eyes or your ankles due to accumulation of fluid. You may have difficulties with breathing. Your blood pressure will increase.

On the other hand, if too much water is removed (excessive weight loss), you will feel weak, nauseated and dizzy. Your blood pressure will be low.

WHAT ABOUT DIET AND FLUID INTAKE?

The effects of dialysis in removing fluid, salt and waste products will not be as efficient as that of healthy kidneys. Therefore, you must follow certain rules about your diet and fluid intake. During training your PD nurse and/or a dietician will talk to you about this.

However, in PD it is not necessary to have as strict a fluid restriction as in haemodialysis, because PD is done daily. How much fluid you may drink per day depends on the amount of fluid you lose by dialysis and the amount of urine you pass. This is individual to each person, and you will be advised by your nurse or dietician.

PERITONEAL DIALYSIS

You will also be advised to avoid gaining too much weight, bearing in mind that the dialysis fluid contains glucose which is very high in calorie.

(See "Fluid restriction", "Low potassium diet", "Low phosphate diet" and "Protein Foods")

SOME PSYCHOLOGICAL REACTIONS TO PD TREATMENT

Starting dialysis (Hemodialysis or Peritoneal Dialysis) is a great impact and can cause different reactions and feelings. Do talk to your nurse or family members about your feelings or if you feel sad (See "Reactions following diagnosis").

It is common for people to feel down and experience mood swings at times when on dialysis and it is important that you are able to talk about how you feel.

Nevertheless many people with dialysis are able to have a good life and to enjoy the things they still can do. Some people discover new ways to lead their life and enjoy it.

PERITONEAL DIALYSIS

WILL YOU BE ABLE TO TRAVEL AND GO ON HOLIDAY?

With good preparations there are many possibilities to go on holidays with PD. You can discuss this issue with the nurses or social workers in your centre. Also, you may like to discuss with other patients as they will have experienced this before.

WHERE CAN YOU GET MORE INFORMATION ABOUT PD?

You can talk to your PD nurse/doctor. They will be able to provide information specific to your needs. You can also get information from your local health service/hospital or the national kidney foundation.

Information on the Internet:

Be careful with the information published on the internet, not all websites provide good quality health information:

- Check any information found on the Internet with your nurse (be cautious not to follow all you read unless you have checked the information with your healthcare professional).

PERITONEAL DIALYSIS

KEY POINTS TO REMEMBER

- When your kidney function reaches stage 5 (eGFR 15%), you will be given a treatment choice between HD and PD.
- Your home must be big enough for storing all materials. A nurse or social worker will visit you at home to discuss this with you.
- PD removes fluid and waste products from your blood through a peritoneal membrane in your abdomen.
- For PD, a catheter is inserted in the abdomen so that dialysis fluid can be infused into the peritoneal cavity.
- PD is usually performed in your own home by yourself.
- There are two forms of peritoneal dialysis: CAPD (you do dialysis exchanges manually) and APD (using a machine called "cycler").
- Before starting PD, you (and your family) will be trained in your own centre by a PD-nurse.
- Proper hygiene and correct hand-washing is important to prevent infection, particularly peritonitis.
- You will be advised to follow some dietary and fluid restrictions.
- A regular "PET test" will be done to ensure that PD is working well.
- Starting dialysis can cause emotional impact on you and your family members. Don't hesitate to talk to your nurse about how you feel.

Text: Aase Riemann, RN, BC, Renal Nursing Consultant – The Netherlands.

Translation: Tatiana Fedorčáková – Czech Republic.

Review: Jitka Pancířová, RN – Czech Republic.