



Your Guide to Peritoneal Dialysis

Module 1: Training for Peritoneal Dialysis



Introduction

This manual was created by Ontario Renal Network in collaboration with Dialysis Training Programs in Ontario to help guide you through peritoneal dialysis (PD). This manual is not meant to replace already existing training materials you may have received, but rather to supplement them as required by your clinic. You are encouraged to seek more information or clarification from your healthcare team, as needed.

You have decided with your healthcare team to begin PD a kind of dialysis that can keep you in control and you can do conveniently in the comfort of your own home and elsewhere. Your team is there to help you succeed. This manual will help you learn about PD and you can refer back to it at any time.

Your Healthcare Team

On peritoneal dialysis, YOU are the most important member of your care team. You are giving yourself these treatments and you know how you are feeling. Remember to keep a positive attitude, ensure to get answers to all your concerns, and take action as needed. The members of your care team are there to help and support you to manage your own care. They will provide the training and support you need to do dialysis safely at home and let you know how to get help if you need it. Your healthcare team may consist of:

Dialysis nurses – Manage your care from assessment to implementation. They provide training and ongoing support.

Nephrologists – Assess and prescribe the best treatment for you. They will see you regularly at clinic, monitor your health and make changes as needed.

Social workers – Assist with any social needs you may have. They may provide counselling to help you adjust to dialysis at home and provide information and resources in your community.

Pharmacists – Review and provide information you need regarding your medications.

Dietitians – Teach you about your special diet and will work with you to maintain proper nutrition and eating habits.

Support staff – Assist with scheduling appointments, keeping your personal information up-to-date and directing your inquiries to the appropriate staff.

Other members – There may be other members of your healthcare team such as a chiropractor, physiotherapist, psychiatrist or dialysis technician. Ask your clinic if these services are available should you need them.

Your healthcare team may also refer you to other specialists as needed.



PD Training

PD is your dialysis treatment of choice. Your healthcare team will help you learn to do PD independently so you can do it at home safely and confidently. At the end of your PD training, you will be able to:

- Understand PD, how it works and the type of PD you will be using
- Set up your dialysis area
- Proper hand hygiene
- Take your blood pressure, pulse, temperature and weight accurately
- Understand how to choose your dialysis solutions
- Be able to complete your treatment (or 'exchange') independently
- Keep a treatment record
- Store and order your supplies
- Care for your catheter and your exit site (where the catheter comes out of your body)
- Know how to recognize, handle and report any problems
- Understand how to follow your diet and fluid limits

Remember, You Are Not Alone

There are many people with kidney disease who use PD.

Your healthcare team is here to help you. You will not do your exchanges on your own at home until both you and your nurse are confident that you can do all of the steps by yourself safely.

Your healthcare team is experienced in helping people with PD. Call your clinic if you need any advice or have concerns. You may also wish to connect with other people receiving PD whom you meet at your clinic or through the Kidney Foundation of Canada – you can often help each other.



Important Contact Information

Your Clinic phone: _____

After-hours phone: _____

Primary nurse: _____ Phone: _____

Primary Nephrologist: _____ Phone: _____

Social worker: _____ Phone: _____

Pharmacist: _____ Phone: _____

Dietitians: _____ Phone: _____

Notes

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module 2

How Peritoneal
Dialysis Works



Your Guide to Peritoneal Dialysis

Module 2: How Peritoneal Dialysis Works



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Peritoneal Dialysis

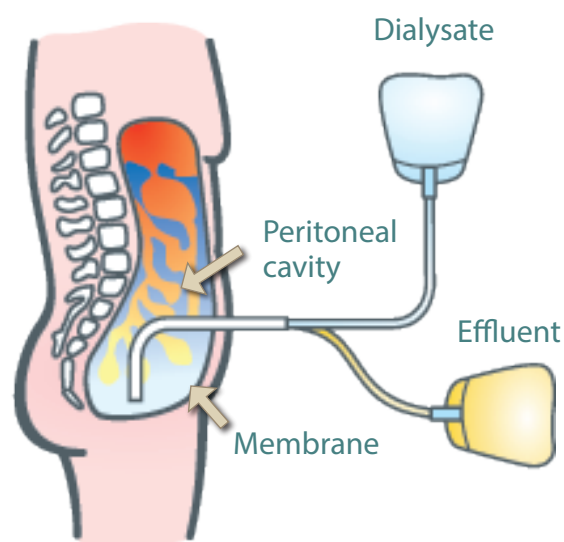
PD is a medical treatment that uses the lining inside your abdomen (called the peritoneal membrane) to remove waste and extra fluid from your blood because your kidneys no longer do it properly.

PD is done at home after successfully completing your training. Completing your own treatments puts you in charge of your life. This can give you back some of the control you may have felt you lost and can improve your quality of life. Compared to other treatment options, PD has fewer restrictions in terms of diet as well as work and travel.

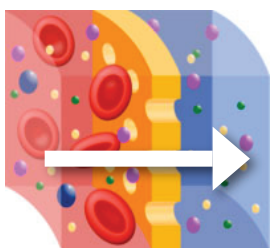
The peritoneal membrane forms a sac called the peritoneal cavity. You might think of it as a big deflated balloon in your abdomen. Through your PD catheter, the peritoneal cavity is filled with a special solution called dialysate. During dialysis, waste products and extra water from the surrounding blood vessels are drawn through the walls of the peritoneal membrane into the peritoneal cavity, acting like a filter.

After a set period of time, the used solution (called effluent), that contains waste products and extra water, is drained, discarded and replaced with fresh dialysate. This process, called an exchange, is repeated a few times manually during the day or automatically by a machine at night while you sleep. An exchange has three steps:

1. **Drain** the used solution or effluent from the peritoneal cavity
2. **Fill** the peritoneal cavity with fresh dialysis solution
3. **Dwell** or to allow solution to remain in the peritoneal cavity for a set period of time. This is when dialysis happens.



In the diagram below, waste products from the blood flow through the pores of the peritoneal membrane (yellow) into the dialysate (blue). This process is called diffusion. Fluid also moves from the blood to the dialysate, or vice-versa, depending on the strength of the dialysate used. This is done through the process called osmosis.



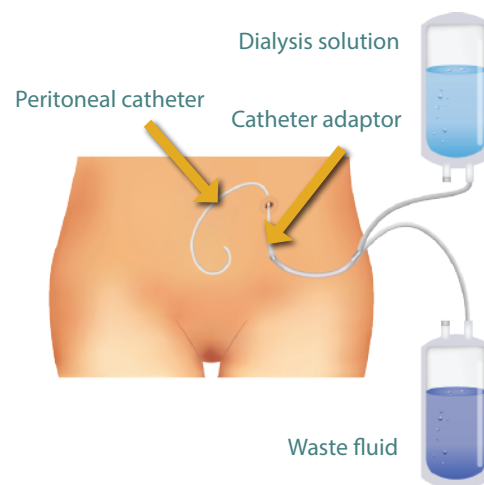
By diffusion, small particles (like waste products) tend to flow from the blood, where they are more concentrated to the dialysate, where they are less concentrated.

By osmosis, fluid tends to flow through the peritoneal membrane from the blood to the dialysate, or vice-versa, depending on the strength of the dialysate.

Your PD Catheter

In order to do PD, a permanent tube, called a PD catheter is used to allow solution to flow in and out of the peritoneal cavity. This soft flexible catheter is inserted during a simple surgery. The point where the catheter comes out of the skin is called the exit site. The exit site will be located near the abdomen and depends on what is best for you. You will be trained how to care for your catheter and exit site to avoid infection.

The catheter adaptor (also called transfer set, extension line or patient line) is the device that connects your catheter to the dialysate tubing. This set is changed by your nurse approximately every six months. The end of the catheter adaptor is covered with a sterile cap. You will be trained how to make connections without touching the end of the catheter adaptor, once the cap is removed, to prevent infection. (Care should be taken during connection as it is a direct opening to your peritoneal cavity.)



Do not touch the end of your catheter adaptor if the cap is off.

Types of Peritoneal Dialysis

There are two main ways to do PD. The first is manually through continuous ambulatory peritoneal dialysis (CAPD). The second is automatically through automated peritoneal dialysis (APD) which uses a cycler machine at night while you sleep. You and your healthcare team will decide which method(s) will best suit your condition and your lifestyle. Most people are trained to do CAPD first before APD.

Continuous Ambulatory Peritoneal Dialysis (CAPD)

With CAPD, the exchanges are done manually every few hours. The exchange takes about a half-hour to complete. While draining and filling, you may occupy yourself reading, watching television, or similar activities. After finishing an exchange, while the fluid stays in the abdomen and dialysis happens, you are free to carry out your usual activities.



Automated Peritoneal Dialysis (APD)

With APD, a machine called a cycler does the exchanges automatically, usually at night while you sleep. You connect to the cycler that has been set up with dialysate before going to sleep, and in the morning you disconnect from it and carry out your usual activities. When you use APD, you may still do CAPD during the day, especially if you are travelling or going away, instead of bringing the cycler. This allows you to dialyze when you are not able to use the cycler. APD may also be called Continuous Cycler Peritoneal Dialysis (CCPD) or Nocturnal Intermittent Peritoneal Dialysis (NIPD).



Notes



Your Guide to Peritoneal Dialysis

Module 3: Doing Peritoneal Dialysis at Home



Preparing to do PD

One of the most important things about PD is to keep the dialysis area and anything that comes in contact with the PD equipment germ-free. The peritoneal cavity is normally sterile (free of germs), so it is important to protect it from germs. Thus, the equipment, fluids and anything that touches the parts of equipment or fluid going into the peritoneal cavity must all be sterile.

Dialysis Area

You can do CAPD almost anywhere in a clean environment. APD should be done where you sleep. For both kinds of PD, consider the following guidelines:

- The surrounding area should be clean, dry and away from drafts
- Fans should be off and windows should be closed
- Keep area well lit and free from distractions
- Use an easy-to-clean work surface
- Keep pets away



Hand Hygiene

Proper hand hygiene is the best way to protect yourself from germs that can cause infection. The use of an alcohol-based hand rub (ABHR) is the preferred method to clean your hands. Use soap and running water to remove visible soil. (www.oahpp.ca)

Alcohol-Based Hand Rub (ABHR)

ABHR kills germs and should be used with every exchange.

1. Put on your face mask, if instructed
2. Pump enough solution to palms of dry hands to rub for **15 seconds**
3. Rub solution to hands, including palms, back of hands, thumbs, and finger tips
4. Allow to dry, do not use towel or paper towel
5. Proceed with exchange immediately



Washing Your Hands Properly

This procedure is needed only if there is visible dirt. Otherwise, use ABHR (see above).

This takes up to 90 seconds to complete.

1. Put on your face mask, if instructed
2. Wet hands with warm water
3. Apply soap
4. Rub hands together vigorously, including palms, back of hands, thumbs, finger tips.
5. Lather for 15 seconds.
6. Rinse well
7. Dry hands with clean or paper towel (as instructed)
8. Use towel to turn water off



- Discard pump soap container when empty, do not refill to avoid contamination
- Allow bar soap to dry in between use. Use of pump soap is recommended.
- 15 seconds of lathering with soap is required to remove germs

Key Points

- Sterile means completely germ-free
- Everything that comes in contact with the peritoneal cavity must be sterile
- Good hand hygiene decreases the germs on your hands making them clean but not sterile
- Touching a sterile part of an item contaminates it and puts you at risk of infection

“Adherence to hand hygiene recommendations is the single most important practice for preventing the transmission of microorganisms (germs) in health care and directly contributes to patient safety.”

- Public Health Agency of Canada

Doing CAPD

Follow these steps when it is time to do your exchange manually.

Prepare:

1. Gather and check all supplies;
 - o Dialysate bag (warmed to body temperature)
 - o Sterile cap for catheter adaptor (check that it is not expired)
 - o Dialysis clamps or CAPD connecting device (e.g. organizer), as required
 - o Face mask, if needed
 - o Soap
 - o ABHR
2. Put on face mask (if instructed)
3. Clean hands
4. Open dialysate pouch and place bags on clean surface
5. Check dialysate bag for:
 - S Strength (0.5%, 1.5%, 2.5%, or 4.25%)
 - C Clarity. Look at printing through the clear side of the bag
 - A Amount. Is it accurate?
 - P Port tabs are intact
 - L Leaks. Squeeze the bag, check seams
 - E Expiration. Check date
 - T Temperature. Is solution at optimal temperature?

Note: Discard any bag that does not meet these requirements

6. Prepare dialysate bag for use and, if applicable, CAPD connecting device according to manufacturer's recommendation
7. Hang full bag on pole or hook
8. Place empty drainage bag on floor



1. Gather and check all supplies



4. Open dialysate pouch and place bags on clean surface

Connect and Drain

1. Clean hands
2. Check that clamp on catheter adaptor is closed
3. Carefully remove cover from dialysate tubing, ensure to keep sterile
4. Remove cap from catheter adaptor, ensure to keep sterile
5. Immediately connect catheter adaptor to dialysate tubing
6. Open catheter adaptor clamp and drain bag tubing to start draining
7. When drain is completed, close catheter adaptor clamp
(or use CAPD connecting device if applicable)



2. Check that clamp on catheter adaptor is closed



3. Carefully remove cover from dialysate tubing, ensure to keep sterile



4. Remove cap from catheter adaptor, ensure to keep sterile



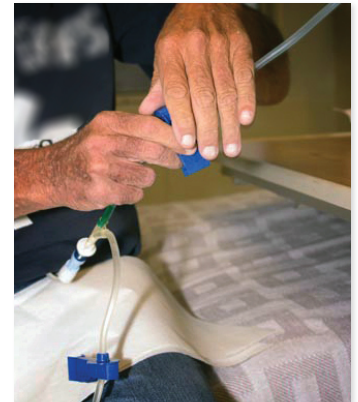
5. Immediately connect catheter adaptor to dialysate tubing

Fill

1. Open fresh dialysate fill tubing to allow fluid into drain bag for 5 seconds
2. Close drain bag tubing using a clamp or CAPD connecting device, if applicable
3. Open catheter adaptor to start filling, if applicable
4. When the dialysate bag is empty, close catheter adaptor
5. Close fill tubing with another clamp, or use CAPD connecting device, if applicable



This is called the “flush before fill” step, which will flush the air from the dialysate fill tubing into the drain bag



1. Open fresh dialysate fill tubing to allow fluid into drain bag for 5 seconds

2. Close drain bag tubing using a clamp or CAPD connecting device, if applicable

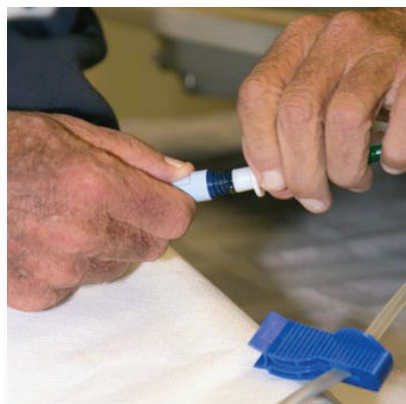
4. When the dialysate bag is empty, close catheter adaptor

Disconnect

1. Put on face mask (if instructed)
2. Clean hands
3. Check that new sterile cap is not expired, then open package carefully
4. Disconnect catheter adaptor from dialysate tubing, ensure to keep sterile
5. Immediately connect sterile cap to catheter adaptor, ensure to keep sterile
6. Secure catheter position on abdomen, as instructed, to prevent pulling on catheter
7. Check if fluid in drainage bag is clear, looking for haziness or fibrin strands
8. Follow bag disposal instructions



Report to clinic if solution is not clear, as instructed by your nurse



4. Disconnect catheter adaptor from dialysate tubing, ensure to keep sterile

5. Immediately connect sterile cap to catheter adaptor, ensure to keep sterile

Doing APD Exchanges

If you are doing APD, follow these steps when it is time to do your treatment:

Prepare:

1. Gather and check all supplies
 - o Dialysate bags
 - o Sterile cap for catheter adaptor (check that it is not expired)
 - o Cyclor tubing set
 - o Cyclor machine
 - o Effluent container or drainage system
 - o Face mask, if required
 - o Soap, if required
 - o ABHR
2. Clean hands
3. Power up and position cyclor, as instructed
4. Open dialysate bag pouch and place dialysate bag on clean surface
5. Check dialysate bag for:
 - S Strength (0.5%, 1.5%, 2.5%, or 4.25%)
 - C Clarity. Look at printing through the clear side of the bag
 - A Amount. Is it accurate?
 - P Port tabs are intact
 - L Leaks. Squeeze the bag, check seams
 - E Expiration. Check date

Note: Discard any bag that does not meet these requirements

6. Place bags on cyclor
7. Load cyclor tubing set onto cyclor, as instructed
8. Connect drain tubing to effluent container or drainage system
9. Put on face mask (If instructed)
10. Clean hands
11. Connect cyclor tubing set to dialysate bags, ensure connections are secured
12. Open clamps, break seals
13. Complete priming of disposable tubing set, following instructions on machine.

Note: The cyclor self-test is automatically completed



7. Load cyclor tubing set onto cyclor, as instructed



8. Connect drain tubing to effluent container or drainage system



11. Connect cyclor tubing set to dialysate bags, ensure connections are secured



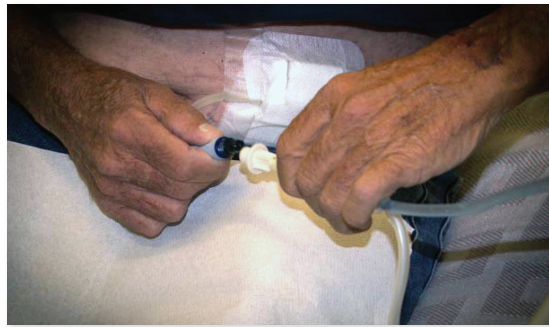
13. Complete priming of disposable tubing set, following instructions on machine.

Connect

1. Prepare catheter adaptor and check that clamp is closed
2. Position catheter for exchange
3. Clean hands
4. Connect catheter adaptor to patient-end of cyclor tubing set immediately, ensure that it is kept sterile
5. Open clamp on catheter adaptor
6. Start cyclor, as instructed



1. Prepare catheter adaptor and check that clamp is closed



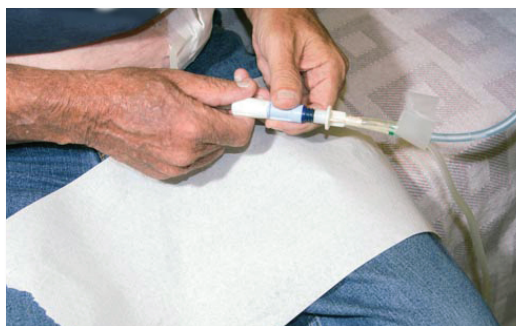
4. Connect catheter adaptor to patient-end of cyclor tubing set immediately, ensure that it is kept sterile

Disconnect

1. Put on face mask (if instructed)
2. Clean hands
3. Close catheter adaptor clamp
4. Check that sterile cap is not expired, then open package carefully
5. Disconnect catheter adaptor from patient-end of cyclor tubing set, ensure that it is kept sterile
6. Immediately connect new sterile cap to catheter adaptor
7. Secure catheter position on abdomen, as instructed, to prevent pulling on catheter
8. Check if fluid in drainage bag is clear, looking for haziness or fibrin strands
9. Follow bag disposal instructions, see below



Report to clinic if solution is not clear, as instructed by your nurse



3. Close catheter adaptor clamp



5. Disconnect catheter adaptor from patient-end of cyclor tubing set, ensure that it is kept sterile



6. Immediately connect new sterile cap to catheter adaptor

Disposal of Effluent and Used Tubing sets

At the end of the dialysis treatment, empty all unused and used dialysate fluids into the toilet. Place used tubing and empty dialysate bags into a plastic green or black garbage bag and dispose with the rest of the household garbage. Proper hand hygiene is important after disposal of effluent, used dialysis bags and tubing.

Choosing your Dialysate

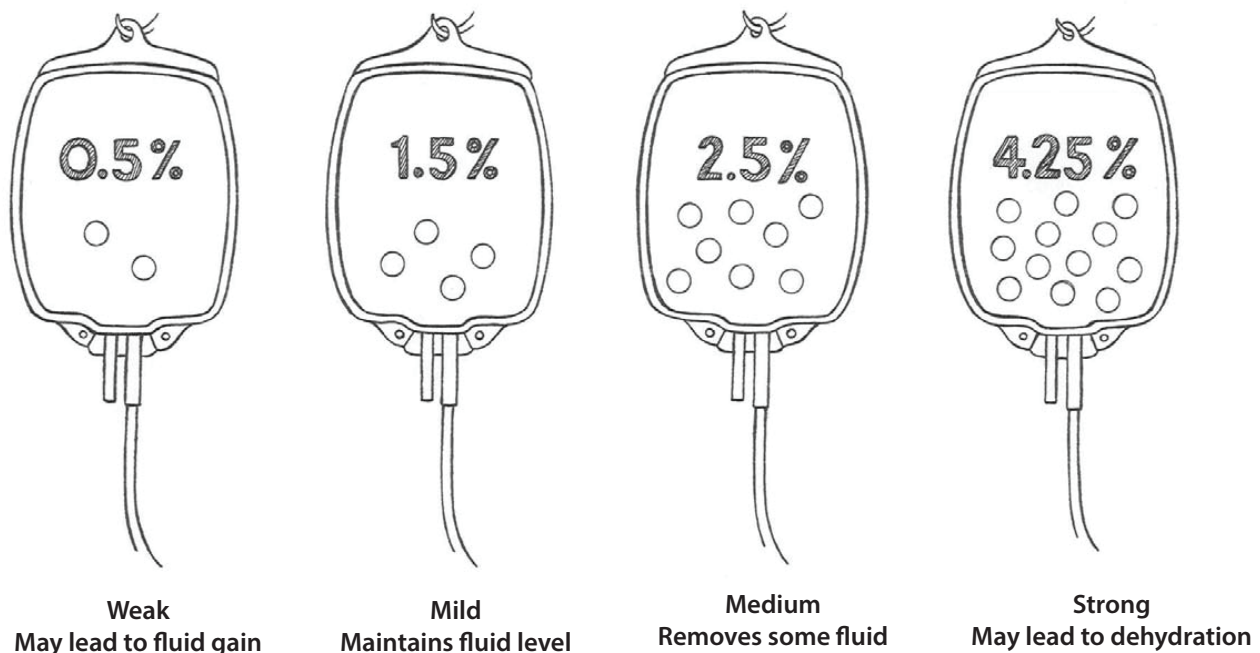
Dialysate solutions come in different strengths depending on the glucose (a form of sugar) concentration. The glucose concentration controls the amount of fluid that may be removed from your blood.

You will learn how to select which strength of PD solution to use.

Every person is unique, and the solutions may act differently, so it is very important to work with your dialysis team to see what strengths work for you. Your nurse may give you a chart or tips on how to choose the right solution.

In general, if you have symptoms of fluid overload, you would need to use a higher strength of dialysate (e.g. 2.5%). On the other hand, if you have symptoms of dehydration, you would need to use a lower strength dialysate (e.g. 1.5%). Your dialysis team will give you guidelines as to when to use what strength, or combination of strengths (in APD) of dialysate to use. Use 0.5% and 4.25% with caution to avoid extreme changes in your fluid status.

The picture below gives a general description of each type of solution:



Treatment Record

It is important to keep a record of your daily treatment record provided by your clinic to keep track of your progress to keep your treatment safe and effective. Your future dialysis prescription will be based on the information you provide. Remember to bring your records with you to each clinic visit.

Adding Medications to Your PD solution

Certain medications, such as heparin or some antibiotics may sometimes be added to the dialysate. You will be taught the proper way to do this by your nurse. Remember that medications added to the dialysate and the needle used should be kept sterile. Some important points to follow when adding medications:

- Wear a face mask (if instructed)
- Clean hands
- Disinfect medication port as taught
- Use only sterile needles and syringes
- Avoid touching the needle, medication port and dialysate injection port
- If you accidentally touch the needle, use a new one
- If you accidentally touch either port, disinfect it again
- Discard the needle and syringe in special container as instructed by your nurse



Ordering Supplies

Your dialysis equipment and disposable items may come from different sources, for example your clinic, pharmacy, or medical suppliers. You will learn what supplies you will need, how much, how often to order and from whom. Most of the supplies are funded by your health program but you are responsible for ordering, receiving and storing them appropriately to avoid extra cost to you or your clinic.

Your clinic and customer representative are there to answer your questions or concerns about your supplies.

A list of supplies is provided in Appendices.

Cleaning your PD Catheter Exit Site

Your PD catheter, which allows you to do dialysis, can be thought of as your “lifeline”. It is secured under your skin with special cuffs which help to hold it in place and prevent the germs from travelling along the catheter into your body. The skin around where the catheter comes out is called the exit site. Proper care of the catheter and the exit site is very important for long-term, safe and reliable use.

Most clinics recommend the “shower technique” to keep the exit site clean when healed. This means cleaning the exit site after a shower. Here are the steps to follow:

1. Gather your supplies:
 - o Soap
 - o Clean face cloth
 - o Clean towel
 - o Cleansing solution (e.g., Hibitaine, Chlorhexidine), or swabs saturated with cleansing solution
 - o 2 packages of 5x5 cm sterile gauze
 - o 1 dressing (e.g. 9 cm x 10 cm Mepore® or 10 cm x 10 cm gauze, as advised by your PD unit)
 - o Exit site antibiotic (e.g., Mupiricin (Bactroban®), Gentamycin, as advised by your PD unit)
 - o Cotton swab (e.g. Q-Tip®) for antibiotic if advised by PD unit
 - o Tape
 - o Net to hold your catheter in place, if preferred
2. Clean your hands
3. Keep your catheter taped in place
4. Remove dressing from exit site and inspect for:
 - o Drainage on dressing
 - o Redness, swelling or pain on exit site
 - o For cracks or tiny holes in catheter

Note: Report to clinic if any of the above is present before proceeding

5. In the shower, wash the rest of your body before the skin around catheter
6. Use another fresh face cloth (or sterile gauze, if instructed) to gently wash the skin around catheter, in a circular motion, starting at the exit site and out
7. Rinse well
8. Dry exit site with clean dry towel (or sterile gauze, if instructed) before the rest of your body
9. Use gauze or swabs soaked with cleansing solution to gently clean exit site, using circular motion, from the exit site moving outwards, as instructed
10. Allow the solution to air dry, and then apply a small amount of antibiotic around exit site, using cotton swab (Q-Tip®) or gauze, if instructed
11. Apply final dressing
12. Replace tape holding catheter to skin, to avoid pulling on the exit site



9. Cleaning exit site in circular motion



- Always handle your catheter with clean hands
- Keep your exit site clean and dry
- Tape catheter in place to avoid any pulling on exit site
- Do not use scissors or sharp objects around your catheter
- Do not soak your exit site and catheter (e.g. soaking in a bathtub)
- Consult your clinic for their recommendations about swimming

Notes

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module 4

Preventing
Problems and
Complications



Your Guide to Peritoneal Dialysis

Module 4: Preventing Problems and Complications



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Common Complications of PD

Any medical treatment has potential problems or complications. Remember that prevention is better than cure. The keys to successful, long-term PD are to follow the techniques you've been taught to keep germs out of your catheter and peritoneal cavity, recognize problems early and seek immediate advice from your healthcare team.



Infection

Infection can occur when harmful germs enter your body. Your catheter and exit site are potential openings for these germs coming from your skin, clothing, coughs or sneezes. Proper hand washing and keeping yourself clean are the easiest ways to prevent infection. The most common infections on PD are peritonitis and exit site infection.

Peritonitis

Peritonitis is infection inside the peritoneal cavity. It is important to recognize and report peritonitis to your healthcare team so that it can be treated immediately. Some of the causes of peritonitis include:

- Contamination of your catheter adaptor or connector through touching, sneezing or coughing
- Holes or cracks in the catheter
- Exit site infection
- Constipation – germs can work their way from the bowels into the peritoneum
- Other infections in your body (e.g. boils or infected cuts) where germs can be carried by your blood to the peritoneum

Symptoms of peritonitis may include (*main symptoms):

- Cloudy effluent*
- Diarrhea
- Abdominal pain*
- Poor catheter flows
- Fever
- Generally feeling unwell
- Nausea/vomiting

If you think you have peritonitis, save your effluent and contact your dialysis team to get immediate treatment.

Exit site Infection

Skin infection may occur around the exit site. If untreated, it may extend deeper around the catheter. This is called a tunnel infection and may eventually lead to peritonitis. Some of the signs and symptoms include:

- Redness
- Discharge or pus on the dressing or around the exit site
- Swelling
- Fever
- Pain or tenderness

If you notice any of these signs or symptoms, contact your healthcare team who will help you to treat it immediately. Keeping the exit site dry and clean may be all you need to prevent or treat an exit site infection, or an antibiotic may be prescribed.

Fibrin in Effluent

Fibrins are white stringy fibres that can sometimes be seen in your effluent and may block the catheter and the flow of dialysate. The nurse may advise you when and how to add Heparin into your dialysate if you need it.

Blood-Tinged Effluent

You may sometimes notice pinkish or bloody effluent, which may be caused by trauma to your abdomen, heavy lifting, menstruation or ovulation. Blood clots may form that could block your filling and draining of solution. The nurse may advise you when and how to add Heparin into your dialysate if you need it.

Difficulty Draining or Filling

Difficulty in draining or filling may be caused by:

- Constipation, as the filled bowels can press against the peritoneal cavity and block the catheter. Constipation may also cause the catheter to drift up in the abdomen. The catheter may move back down by itself when constipation is relieved with a laxative.
- In other cases, blood clots and fibrin can block the catheter. You may be advised by your healthcare team to use Heparin to prevent clots and fibrin from forming.
- Kinks in your catheter tubing or closed clamps. Check for any type of blockage along dialysate tubing and catheter.

Hernia

A hernia is a weak spot in the muscle of the abdomen or groin, seen as a bulge or a bump. It may appear slowly or suddenly near an incision line, your belly button or in your groin area. Some people on PD get hernias from doing heavy exercise or lifting while having dialysis fluid in the abdomen. An operation is sometimes needed to repair the hernia. Contact your healthcare team if you think you may have a hernia and do so immediately if this becomes suddenly painful.

Weight Gain

Most PD solutions use sugar to remove fluid from your blood. The use of higher strength dialysate gives you more calories from the sugar in the solution. Exercising and choosing foods with fewer calories can help you keep off the extra weight. Watching your salt and fluid intake will help you avoid needing to use of higher strength dialysate which will lower your intake of unwanted calories.

Pain

If you have pain during any part of your dialysis exchange, it is important to let your dialysis team know. Some kinds of pain can be avoided with minor changes in how the exchange is done, so your team can often help you avoid or treat pain.

Contamination

It is important that the dialysate that fills your abdomen and sterile parts of the catheter adaptor and dialysis tubing connections remain sterile.

Contamination of the ends of your catheter adaptor and dialysis tubing occurs by touching these parts with anything non-sterile (e.g. your hands, table, outside of packaging) which could lead to an infection of your peritoneal cavity. If the end of the adaptor accidentally touches anything not sterile, then:

- Stop the exchange immediately
- Connect a new sterile cap to catheter adaptor
- Wait 15 minutes before connecting with another dialysate bag
- Discard contaminated dialysate bag or tubing

Fluid Overload

Too much fluid can occur in your body due to increased fluid, salt intake (salt makes you retain fluid) or if you made an incorrect choice of the dialysate strength in a previous exchange.

The common symptoms of fluid overload are:

- Weight increase that is more than usual
- Swelling of ankles, legs or fingers or puffiness around the eyes

- Shortness of breath
- Headaches
- Higher blood pressure than your normal

When you recognize that you have too much fluid, follow these steps:

- Using a stronger dialysate strength, as instructed
- Consult your team for guidance, if needed
- Limit your fluid and salt intake
- Consult your dietician, if needed

Dehydration

Dehydration means too little fluid in your body. It could happen through diarrhea, too much sweating, or if you made an incorrect choice of the dialysate strength in a previous exchange. The common symptoms of dehydration are:

- Lower weight than usual
- Tiredness or weakness
- Dizziness and fainting
- Leg cramping
- Lower blood pressure than normal

When you recognize that you are dehydrated, follow these steps:

- Use a weaker dialysate, as instructed
- Consult your nurse for proper guidance, if needed
- Eat or drink something salty (e.g. chicken soup)

Notes

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module 5

Staying Healthy
and Active



Your Guide to Peritoneal Dialysis

Module 5: Staying Healthy and Active



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Keeping Healthy

Clinic Visits

Regular clinic visits are arranged by your care team to track your progress, making sure that you are getting the best possible treatment. The visits give you a chance to speak with your healthcare team and to get answers to your questions and concerns. During the visit, your doctor will assess how well you are doing, monitor your fluid status and discuss the results of your blood work or other tests. Special procedures, such as changing your catheter adaptor, may also be done at this time.

To make the most of every visit, you may prepare yourself by bringing:

- A list of your medications in the original pharmacy containers
- Your daily dialysis records
- Fluid collected as instructed
- A list of questions/concerns
- Information/reports from other doctors you have seen
- Other items you may be wondering about



Monitoring Your Body Fluids

When the kidneys stop working, your urine output may slow down and fluid may start to build up in your blood and in your tissues. This can cause edema or swelling, high blood pressure and increased weight. It is important to prevent extra fluid buildup by limiting your fluid and salt intake (salt causes water to be retained). Extra fluid can be removed by using the dialysate with the proper strength. 1 liter of fluid weighs 1 kilogram, so your weight is a good way to know how much fluid needs to come off during dialysis.

You will determine the strength of dialysate to use based on your:

- Weight: How your current weight varies from the target weight
- Blood Pressure: Your current blood pressure – and comparing it to your “normal”
- Fluid status: Whether you have dehydration (too little fluid) or fluid overload (too much fluid)

Too much or too little fluid in your body can lead to different symptoms. Assessing these symptoms will help you know which strength of dialysate to use and whether your target weight needs to be discussed with your team and possibly changed.

This table can help you know if you have dehydration (too little fluid) or fluid overload (too much fluid) in your body.

Dehydration (too little fluid)	Fluid Overload (too much fluid)
<ul style="list-style-type: none"> • Lower weight than usual • Tiredness or weakness • Dizziness and fainting • Leg cramping • Lower blood pressure than your normal 	<ul style="list-style-type: none"> • Increased weight than usual • Swelling of ankles or fingers or puffiness around the eyes • Shortness of breath • Headaches • Higher blood pressure than your normal

Target Weight

In order for you to determine the proper strength of solution, your nurse and doctor will first establish your target weight which you are aiming to achieve. This is the weight at which:

- You feel well, (no shortness of breath or swelling in your ankles)
- Your blood pressure is within your normal range

Your doctor will then advise you of your target weight. Your target weight usually remains the same every day but may need to be adjusted if you gain or lose body weight. (PD removes only weight accumulated through fluid buildup, not body weight.)



- Weigh yourself at the same time every day (e.g. before breakfast)
- Weigh with the same amount of clothing
- Place scale on a smooth, flat surface

Blood Pressure

Blood Pressure is the pressure exerted by blood against the walls of the blood vessel. It is expressed as a pair of numbers, e.g., 120/80. These represent the maximum (systolic) and minimum (diastolic) pressure measured as the heart pumps and relaxes within the course of one heartbeat.

You will be taught how to monitor and record your blood pressure at least once a day. Your blood pressure may increase as fluid builds up in your blood vessels.

Blood Work

The result of your blood work will help see certain aspects of how well your body is responding to dialysis. This helps you and your healthcare team adjust your dialysis prescription, medication and diet as needed. It is a really good idea to keep track of your results and discuss them with your nurse, doctor or dietitian to follow your progress. A list of the common blood work done is included in the Appendix- Module 6.

Adequacy of Dialysis

Testing for adequacy of your dialysis can tell how well your blood is being cleansed. For this test, you may have to collect your urine and effluent for 24 hours, bring them to your clinic and have blood work done. Your team will give you specific directions about how and when to do this.

Peritoneal Equilibrium Test (PET)

Everyone's peritoneal cavity functions differently on dialysis. A test called Peritoneal Equilibrium Test (PET) is usually done after you have started PD. This test may help the team decide how long the PD solution should stay in your peritoneal cavity to give you the best results, or which type of PD will work best for you.

The test usually takes about four hours. Your clinic will give you instructions to prepare you for the test.

Key Points

- Target weights can change due to losses or gains in body weight
- Dialysis removes fluid weight, not body weight

24 Hour Urine Collection

You may be asked to collect your urine for 24 hours to assess how well your kidneys are working and to make your dialysis prescription adequate.

Diet

Dialysis and kidney failure can affect your nutrition. As a result, there are certain nutrients in foods which have to be avoided or added. Your blood test results will guide you and your dietitian to establish a diet plan to keep you healthy.

Protein

Protein is important for growth and repairs that are necessary for a healthy body, but it can be lost in the drained fluid. Your diet should include enough protein from meat, poultry, fish, tofu, low sodium cottage cheese and other foods your dietitian may recommend.

Phosphorus

Phosphorus is not removed well through PD and can build up causing bone and heart problems, and even itchy skin. You may need to restrict or limit eating foods that are high in phosphorus such as milk and milk products, dried beans, peas, lentils, organ meats, whole wheat, processed foods containing phosphorus additives, etc.

Sugar

Sugar (also called glucose) in the PD dialysate can give you a few hundred extra calories each day. Because of this, some people on PD may gain weight. You can help prevent this by staying active and eating fewer sweets and starchy food such as baked goods, rice, corn or potatoes. The sugar content in the PD solution may also make it difficult to control your blood sugar levels if you have diabetes. It is important to stay in contact with your diabetes team to review your blood sugar control regularly when you are on PD.

Salt

Salt can cause you to retain fluid, leading to high blood pressure, swelling and even breathing difficulties. It is extremely important to have very little salt in your food, so that you drink less fluid. Avoid adding salt when you're cooking and at the table. It is also important to avoid most fast foods, packaged, and processed foods because they contain huge amounts of salt (also known as sodium chloride – so be sure to read package labels).

Potassium

Potassium is needed to keep the nerves and muscles working, but too little or too much can be harmful. Plan your potassium intake depending on your blood level. Potassium comes from fruits (including bananas, oranges, cantaloupes and nectarines) and vegetables (including baked potatoes, spinach, winter squash, and tomato sauce). Some foods have less potassium, so your dietitian will help you learn what foods and what amounts you can eat safely, and what to avoid.

Fibre

Fibre can help avoid constipation that can complicate the flow of dialysate in PD. Choose high fibre foods with a low phosphate and potassium content such as: natural wheat bran, corn bran cereal, pears and apples, as advised by your dietitian.

Fluid

Fluid comes from obvious sources such as tea and coffee but foods may also contain fluid (e.g. soup, ice cream, Jell-O). These fluids have to be counted as your daily intake. Some people on PD may have to limit their fluid intake depending on their weight, blood pressure and symptoms. Talk to your dietitian, nurse and doctor about your fluid needs.

Medications

Medications, together with dialysis, diet and fluid control, can help keep you healthy with kidney failure and dialysis. Medications are prescribed according to your needs. Your pharmacist and nurse will teach you how to take your medications properly.

It is very important to take your medications as prescribed and to alert your team promptly if you are experiencing any unexpected side effects. If you have been given a prescription by a doctor outside of your healthcare team, it is important to consult them before taking this medication. Also consult your team before taking any over-the-counter and alternative medications (such as herbal).

Some medications that many people with kidney failure require include:

Phosphate Binders

Phosphate binders bind with the phosphate from your food as you eat and prevent it from building up in your body. They must be taken with your meals. There are different kinds of phosphate binders such as calcium (Tums®), Sevelamer (Renagel®) and Lanthanum (Fosrenol®).

Vitamin D

Vitamin D (Rocaltrol® or Calcitriol) in its active form helps your body use calcium better and avoids bone problems.

Erythropoiesis Stimulating Agents

Erythropoiesis Stimulating Agents (ESAs) such as Eprex® or Aranesp injections treat anemia by helping the bones to make more red blood cells. Treating anemia can give you more energy.

Iron

Iron can help make red blood cells. You may take this by mouth or intravenously. The intravenous method is usually done in the clinic.

Vitamin

Vitamin supplements (Replavite®) are used to replace vitamins B,C and folic acid that is lost during dialysis.

Stool softeners

Stool softeners such as docusate (Colace®) can help prevent constipation

Laxatives

Laxatives such as Senna (Senakot®), Lactulose, Dulcolax, Golytely can help relieve constipation.

Blood pressure medications

Blood pressure medications lower blood pressure and help your heart work well.

Blood sugar lowering medications

Blood sugar lowering medications (pills) are used by some people with diabetes to reduce their blood sugar level to prevent harmful effects on the body. There are many different types and it is very important to take what's prescribed for you.



Insulin

Insulin is sometimes used by some people who have diabetes to lower their blood sugar level. The dose of insulin must be adjusted individually on PD to account for the sugar content of the dialysis solution.

Cholesterol medications

Cholesterol medications lower your blood cholesterol level which decreases your risk for heart attacks and strokes .

Antibiotics

Antibiotics may be prescribed to fight infections, such as peritonitis. Sometimes, certain antibiotics can be added to your dialysate bag. You will be taught how to do this properly by your nurse.

Heparin

Heparin is a medication that prevents fibrin from forming. Fibrins are white stringy fibers that can sometimes be seen in your effluent and may block the catheter and the flow of dialysate. The nurse may advise you when and how to add Heparin into your dialysate when you need it

Exercise

Exercise helps raise your energy level, increases strength, endurance and well-being. Known medical benefits of exercise include: improved blood pressure control, lowered cholesterol and reduced depression. For people on PD, regular exercise may help prevent unwanted weight gain from the extra calories in the dialysis solutions.

Speak to your healthcare team about a safe exercise program while on PD. The key is to maintain activity while avoiding increased pressure in your abdomen that could lead to hernia, or pouching through a weakened area of muscles.

Swimming exposes your catheter or exit site to possible sources of infection. Ask your team for advice about swimming with your PD catheter.



Body Image and Intimacy

There is no question that kidney failure and dialysis can change your body which may affect your self-image and your feelings about sexuality and intimacy. Sometimes people feel too tired to carry out sexual activity, and some of the medications may also change sexual feelings. Awareness and acceptance of these possible changes may help you deal with these feelings.

Remember that you are not alone in this situation. You may find it difficult to talk about sex and intimacy. When you are ready, ask any of your team members, as there are people and resources around you that can help you, your partner and your family. You may also find it helpful to seek support from other people on PD who have similar issues and learn from their experiences. Your healthcare team can help you connect with others and talk with you about your feelings and concerns. There might be changes in your dialysis and medications that could improve sexual function, so be sure to talk to your doctor or nurse.

Communicating with your partner about your feelings is very important. Many people express intimacy in a variety of ways such as hugging, kissing and cuddling, and not only through sexual activity. More information can be obtained from your healthcare team or websites such as: www.kidney.ca/documentdoc?id=314.

Travelling

The portability of PD makes travelling easier than with other forms of dialysis. It is possible to carry your own supplies for short trips and have them pre-delivered for longer trips.

Plan your trip with your clinic and PD supplier in advance. Some of the preparations you need to consider before you travel include:

- Type of dialysis you will use when you are away (APD or CAPD-many people who use APD switch over to CAPD for travel)
- Electricity current at destination if using APD (discuss with dialysis technologist if different from North American voltage)
- Amount of required supplies you need while you are away including how much you would need in transit
- Cost of delivering your supplies to your destination, if any
- Medical documents, including medication list, for customs as well as in case of emergencies
- Knowing where the closest hospital is to your destination
- Find out if close hospital has a Nephrology (kidney) department familiar with PD
- Medications. Check with your clinic if you are to bring extra medications such as antibiotics, heparin, ESAs
- Need for vaccinations and medical insurance





Your Guide to Peritoneal Dialysis

Appendices: Glossary of Terms, Personal Work
Charts and Treatment Record



Glossary of Terms

Albumin	A protein, the level of which in your blood is used to measure your nutrition level.
Anemia	A condition that happens when there are too few red blood cells in your blood
Adequacy of dialysis	A test to measure how well your blood is being cleansed by dialysis
Alcohol-based hand rub (ABHR)	A solution containing alcohol to clean your hands (also called hand sanitizer)
Automated peritoneal dialysis (APD)	A form of peritoneal dialysis that uses a machine to do the exchanges automatically
Blood pressure	The pressure exerted by blood against the walls of the blood vessel
Blood urea nitrogen (BUN)	A waste product of protein break down that is measured in the blood
Calcium	A mineral, important for strong bones and body functions, that needs to be regulated in kidney failure
Cholesterol	A type of fat in your blood which may increase the risk for heart attack and stroke
Contamination	Occurs by touching sterile parts with anything non-sterile
Continuous ambulatory peritoneal dialysis (CAPD)	A form of peritoneal dialysis where exchanges are done manually
Peritoneal dialysis	A treatment for kidney failure using the lining in your abdomen to filter wastes and balance fluid in your blood
Catheter adaptor	A plastic tube that connects your catheter to the dialysate tubing (also called transfer set, extension line or patient line)
Continuous cycler peritoneal dialysis (CCPD)	A form of peritoneal dialysis that uses a machine to do the exchanges automatically
Creatinine	A waste product of muscle break down that is filtered from your blood by the kidneys
Cycler machine	Used to do automatic peritoneal dialysis exchanges
Cycler tubing sets	Used on cycler to connect the peritoneal dialysis solutions to the peritoneal dialysis catheter
Dehydration	Condition that occurs with too much fluid removal
Diabetes	A disease that causes high blood sugar

Dialysis	A treatment for kidney failure to remove wastes from the blood
Dialysate	A special solution used for dialysis
Diastolic	The pressure in your blood vessel as the heart relaxes between heartbeats (the lower number in a blood pressure reading)
Diffusion	The movement of particles, such as wastes, from a more concentrated area to less concentrated area
Drain bag	Receives used dialysis solution
Dwell	Period when dialysis solution stays in the peritoneal cavity
Edema	Collection of extra fluid in tissues causing swelling
Effluent	Used dialysis solution that contains waste and water from the body
Exchange	A process by which used dialysis solution is replaced with fresh solution
Exit site	The point where the catheter comes out of your skin
Fibrins	White stringy fibers sometimes seen in used dialysis solution
Erythropoiesis-stimulating agents (ESAs)	Injections used to treat anemia
Fill	Fresh dialysis solution flowing into the peritoneal cavity
Fluid overload	Retention of too much fluid in your body
Germs	Microscopic organisms that can cause disease
Hand hygiene	A process to remove dirt and germs from the hands
Hernia	A weak spot in the muscle
Hemoglobin	The part of the red blood cells that carry oxygen throughout the body
Insulin	Regulates blood sugar levels for patients with diabetes
Heparin	Medication used in dialysis to prevent blood from clotting
Laxative	Medication used to treat constipation
Nephrologist	Medical doctor who treats kidney disease
Over-the-counter medication	Does not need a prescription to buy
Osmosis	Movement of fluid through the membrane from a lower sugar concentration (blood) to a higher concentration (dialysate)

Parathyroid hormone (PTH)	Controls calcium and phosphorus levels in your blood
Peritoneal dialysis (PD)	A treatment for kidney failure that uses the lining inside your abdomen, called a peritoneal membrane, to clean your blood
Peritoneal membrane	The porous lining that surrounds the abdominal organs
Peritoneal equilibrium test (PET)	A test that measures how well your peritoneum moves wastes and water
Peritoneal cavity	The sac or empty space in your abdomen surrounded by porous membrane
Peritonitis	Infection inside the peritoneal cavity
Phosphorus	A mineral that can build up in kidney failure and cause itching, bone and heart problems
Potassium	A mineral for proper function of all cells, tissues and organs when it is at normal levels, but needs to be regulated closely in kidney failure.
PD catheter	A permanent tube that allows solution to flow in and out of the peritoneal cavity
Sterile	An area completely free of germs
Strengths	Concentration of glucose (a form of sugar) in the PD solution
Systolic pressure	The pressure in the blood vessel as your heart pumps in one heartbeat (the higher number in a blood pressure reading)
Tunnel infection	An infection that extends deeply around the catheter

Your Supplies

The equipment and supplies required to do PD vary depending on the products used by your clinic.

Generally, you will need:

- Dialysate bags (solutions)
- Sterile cap
- Dialysis clamps
- PD connecting device
- Mask
- Hand sanitizer (ABHR)

Plus, for APD:

- Cyclor machine
- Cyclor tubing
- Drain bags

CAPD Treatment Record

CAPD System: _____

Exchange Volume: _____

Exchange Frequency: _____

Target Weight: _____

Name: _____

Date										
Exchange Time										
Present weight										
Sitting BP										
Standing BP										
Bag%, or type										
Blood Sugar										
Medications										
Effluent volume										
Observations										
Exit site care										
Observations										
Bowel movement										
Comments										

APD Treatment Record

APD System: _____

Exchange Volume: _____

Exchange Frequency: _____

Target Weight: _____

Name:

Date										
Exchange Time										
Weight (wet)										
Weight (Dry)										
Sitting BP (pre)										
Sitting BP (post)										
Standing BP (pre)										
Standing BP (post)										
Bags%, #, or type										
Blood Sugar										
Medications										
Effluent volume										
Observations										
Exit site care										
Observations										
Bowel movement										
Comments										

Blood Work Record

Blood work	Why it is important	Usual range	Your level				
			Date	Date	Date	Date	Date
Creatinine	Measure how well your kidney is working and how well your blood is cleansed by dialysis	300 – 1200 mmol/L					
BUN		10 – 30 mmol/L					
Potassium	Can be dangerous if it is too high or too low. Keep it in a safe range with dialysis, diet and medications	3.5 – 5.5 mmol/L					
Calcium	Need to be balanced to maintain strong bones and teeth and to help muscles work	2.10 – 2.6 mmol/L					
Phosphorus		0.8 – 1.8 mmol/L					
Parathyroid Hormone (PTH)		20 – 35 mmol/L					
Albumin	Measures nutrition	35 – 52 g/L					
Blood Sugar	Measures diabetes control	4.0 – 10.0 mmol/L					
Hemoglobin	Measures anemia	110 - 120 g/L					

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