

National Kidney
Foundation™

What You Need to Know About Peritoneal Dialysis

Getting the Most From Your Treatment



National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (NKF-KDOQI™)

The National Kidney Foundation is developing guidelines for clinical care to improve patient outcomes. The information in this booklet is based on the KDOQI™ recommended guidelines for nutrition. All KDOQI™ guidelines provide information and assist your doctor or health care team in making decisions about your treatment. The guidelines are available to doctors and other members of the health care team. If you have any questions about these guidelines, you should speak to your doctor or the health care team at your treatment center.

Stages of Chronic Kidney Disease (CKD)

In February 2002, the National Kidney Foundation published clinical care guidelines for chronic kidney disease. These help your doctor determine your stage of kidney disease based on the presence of kidney damage and your glomerular filtration rate, which is a measure of your level of kidney function. Your treatment is based on your stage of kidney disease. (See the table below.) Speak to your doctor if you have any questions about your stage of kidney disease or your treatment.

Stages of Kidney Disease		
Stage	Description	Glomerular Filtration Rate (GFR)*
1	Kidney damage (e.g., protein in the urine) with normal GFR	90 or above
2	Kidney damage with mild decrease in GFR	60 to 89
3	Moderate decrease in GFR	30 to 59
4	Severe reduction in GFR	15 to 29
5	Kidney failure	Less than 15

*Your GFR number tells your doctor how much kidney function you have. As chronic kidney disease progresses, your GFR number decreases.

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What You Need to Know About Peritoneal Dialysis

This booklet is written for adults who are receiving peritoneal dialysis (PD) for kidney failure and their families and friends. It is also written for people who have chronic kidney disease and may someday need a treatment for kidney failure, such as hemodialysis, peritoneal dialysis or a kidney transplant. Learning all you can about these treatments will help you make the best decision if and when you need to choose one of them.

The purpose of the booklet is to describe peritoneal dialysis and how it relates to living with kidney failure.

The booklet will:

- guide you in caring for yourself with peritoneal dialysis
- answer common questions about how peritoneal dialysis works
- describe the types of peritoneal dialysis available
- explain why it's important to get enough dialysis
- explain why it's important to follow your special diet
- tell you about how your anemia is treated
- tell you about preventing and treating bone disease
- give you some important facts about preventing heart problems
- tell you why it's important to take an active role in your own care.

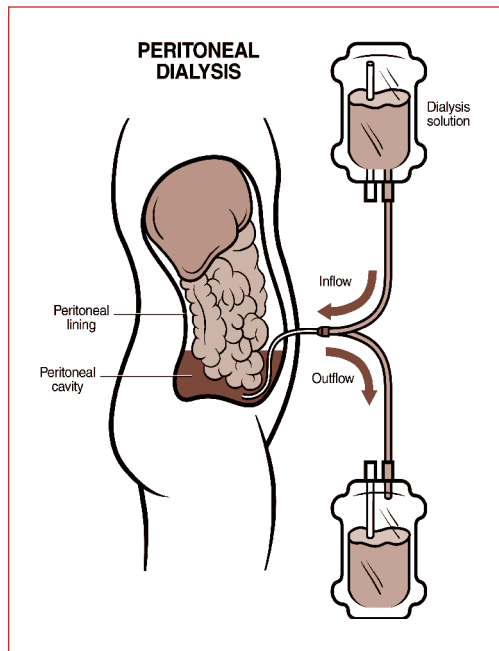
If you are receiving hemodialysis treatment, see *What You Need to Know About Hemodialysis*. If you have not started treatment yet, see the booklet *What You Need to Know About Chronic Kidney Disease*. Both of these booklets are available from the National Kidney Foundation.

What Does Peritoneal Dialysis Do?

Peritoneal dialysis, or **PD**, is one of the three treatments for kidney failure. The other treatments are **hemodialysis** and **kidney transplant**. Both hemodialysis and peritoneal dialysis remove wastes and extra fluid from your blood, which are usually removed by healthy kidneys. When your kidneys are not working, wastes and fluid build up and that can cause:

- nausea and vomiting
- trouble sleeping
- hiccups
- weight loss
- abnormal bleeding
- anemia
(low red blood cell count)
- poor appetite
- fatigue
- loss of energy
- itching
- cramping at night
- swelling
- trouble breathing

Peritoneal dialysis cleans wastes from your blood. PD does this by using your peritoneal membrane—the lining of your belly, as a **natural filter**. To do PD, you must have a soft tube, called a **catheter**, placed permanently in your belly. This is done by minor surgery. A cleansing fluid called **dialysate** travels



through this soft tube into your belly. Wastes and extra fluid pass into this dialysate from your blood. After several hours, you drain the fluid from your belly through the same tube and discard it. Then you **start the cleansing process again by adding fresh cleansing fluid**. Removing the used dialysate from your belly and replacing it with fresh fluid is called an **exchange**.

There are different types of peritoneal dialysis.

The major ones are:

- CAPD, or continuous ambulatory peritoneal dialysis
- CCPD, or continuous cycling peritoneal dialysis
- NIPD, or nighttime intermittent peritoneal dialysis.

In **CAPD**, you drain the dialysis fluid into your belly yourself by placing the bag of fluid above shoulder level. Four to six hours later, you drain the used fluid into a discard bag that is placed below waist level. This is done four to six times each day. In **CCPD**, a machine called a cycler automatically pumps the fluid in and out of your belly while you sleep. With CCPD, fluid is left in your belly during the day to continue the process of cleaning your blood. You may also need to make additional exchanges during the day if recommended by your doctor. **NIPD** works the same as CCPD, except that your belly is dry during the day.

Getting the Right Amount of Dialysis

Getting the right amount of dialysis treatment is important to:

- improve your **overall health**
- help you **live longer**
- improve your **quality of life**
- keep you **out of the hospital**.

Research has shown that you will feel better and live longer when you get enough dialysis. If you do not get enough dialysis, you may feel tired and sick and have some of the symptoms listed on page 5. If you notice any of these, you



should tell your dialysis care team right away. However, you may not have any symptoms. The only way to tell if you are getting enough dialysis is for your dialysis care team to regularly measure your “delivered dose” of dialysis. (See “How Your Delivered Dose of Dialysis is Measured” on page 9.) If you are getting the right amount of dialysis, you should feel well, have a good appetite and be able to do many of the activities you enjoy.

Your PD Prescription

Your doctor will **give you a dialysis prescription** that is designed especially for you. The goal of this prescription is to make sure you reach your target delivered dose of dialysis. This amount of dialysis is different for everyone. It is based on many factors including your weight, how much kidney function you still have and the results of your lab tests. Your prescription will tell you:

- How many **exchanges** you need to make each day.
- How long the dialysis fluid needs to stay in your belly (your **dwell time**).

- What **type and amount** of dialysis fluid you need to use for each exchange.

Your doctor will base your prescription on the following:

- **Your size**—Large, muscular people may need more frequent exchanges or larger bags, which means that more dialysis fluid goes into your belly.
- **Your PET, or peritoneal equilibration test**—This test is done within the first month after starting PD. It tells how your peritoneal membrane is working and helps your doctor decide how many exchanges you need each day, how long the dialysis fluid should stay in your belly, what amount of dialysis fluid you need and what type of dialysis fluid to use.
- **Your remaining kidney function**—The amount of kidney function you have will affect how much dialysis you need. Your doctor or dialysis care team should measure your remaining kidney function. This is measured by a blood test and 24-hour urine collection. It should be checked every four months if your urine output is stable. However, if your urine output is decreasing, your remaining kidney function should be checked every two months. You should tell your doctor whenever you notice a drop in your daily urine output.
- **Your nutritional health**—How well you feel on dialysis may be affected by how well you eat. If you have problems getting the right amount of nutrients from your diet, your dialysis prescription may need to be changed, or you may need to take nutritional supplements.

How Your Delivered Dose of Dialysis Is Measured

The best way to ensure that you are getting enough treatment is for your dialysis care team to measure your **delivered dose of dialysis**. This tells them how well your treatment is removing **wastes such as urea and creatinine** from your blood. The tests used to check your delivered dose are called your **Kt/V** (pronounced kay tee over vee) and your **creatinine clearance**. The following chart tells you what your weekly target numbers should be for these tests:

Type of PD Clearance	Weekly Kt/V	Weekly Creatinine
CAPD	At least 2.0	At least 60 Liters**
CCPD	At least 2.1	At least 63 Liters
NIPD	At least 2.2	At least 66 Liters

** CAPD patients who have a low or low average result on the PET will have a slightly lower weekly creatinine clearance target.

Your dialysis care team should measure your **Kt/V** and **creatinine clearance** every four months. These measurements should be done more often when:

- you first start PD treatment
- your PD prescription is changed
- your dialysis care team feels it is needed.



To measure your Kt/V and creatinine clearance, your dialysis care team may ask you to bring to the dialysis center all the dialysis bags you used over a 24-hour period, or just a sample from each of the used bags. You also may be asked to collect a urine sample. Both the urine samples and the dialysate samples are important in measuring your total dose of dialysis.

Keeping Track of Your Lab Values

You should **know as much as possible** about your important lab values such as Kt/V and creatinine clearance. You may want to keep track of them to make sure you stay on target. You may obtain a copy of the Dialysis Lab Log by calling the National Kidney Foundation's toll-free number 800.622.9010. If any of your numbers is not what it should be, ask your doctor or dialysis care team what you can do to improve it.

If Your Delivered Dose of Dialysis Is Too Low

If your Kt/V and creatinine clearance are not as good as they should be, your dialysis care team will do some tests to find out why. They may check to see if:

- You are doing **all your exchanges** as prescribed for you.
- You are collecting your **urine and dialysate samples** correctly.
- Your **peritoneal membrane** is working well. To do this, your **PET test** may be repeated. Your membrane may not work as well if you have had serious infections, or if you have been on PD for several years. If a change has occurred, your doctor may need to change your dialysis prescription.
- Your remaining kidney function has decreased too much. If this happens, your doctor may want you to:
 - increase the number of bags you use each day
 - use a cycler occasionally or regularly
 - switch to hemodialysis.

What You Can Do

Because you do your own treatments, getting the right amount of dialysis depends on how well you follow your prescription. Make sure you:

- Do all your prescribed **exchanges**.
- Follow the **prescribed amount of time** (dwell time) you keep the dialysis fluid in your belly.
- Use the full amount of **dialysis fluid** prescribed for you.
- **Prevent infections** by doing your exchanges exactly as you were taught.
- Take all your **medications** exactly as ordered by your doctor.

- **Follow your diet** and fluid allowances.
- **Report any problems** to your doctor or dialysis care team.
- Never be afraid to **tell your dialysis care team exactly how you do your exchanges**. This is the best way to make sure you are doing them correctly.

Routine Checkups

Regular checkups are also an important part of your care. Your doctor and dialysis care team will check:

- **your overall health** and **nutritional health**
- any **symptoms** that indicate you may not be getting enough dialysis
- how you are doing with **your exchanges**
- other important **lab values**. (See “Understanding Your Lab Values” on page 29.)

You should make a list of any questions you have about your treatment. Do not be afraid to ask your doctor or dialysis care team about any problems you may have.

Other Important Parts of Your Care

Getting the Right Nutrition

Getting the right nutrition is as important to your health as getting the right amount of dialysis. The **registered dietitian at your dialysis center** will help you plan your diet to make sure you get **enough calories and protein** each day to stay healthy. Research has shown that patients who do not eat the right amount of protein and calories are more likely to spend time in the hospital. They may even shorten their life.

Protein is important because it helps build and repair body tissue. If you do not have enough protein, it may be because:

- You may not be eating enough protein.
- You may be losing too much protein in the **dialysis drain** fluid, especially if you have a serious infection called **peritonitis**.
- You may still be losing protein in your **urine**.
- Your body may not be making enough protein.
- You may not be getting **enough dialysis**, which can cause wastes to build up in your blood and can decrease your **appetite**.

Calories are important because they give your body energy, allow the protein you eat to be used properly and help you maintain a healthy weight. Because your dialysis fluid contains a type of sugar, you may have a tendency to gain too much weight. Your dietitian can help you plan your diet to get the right amount of calories and keep the right weight for you.

Your PD treatment can affect your appetite by causing a feeling of fullness because your belly always contains dialysis fluid. In addition, the sugar in your dialysis fluid may make you feel less hungry.

Checking Your Nutritional Status

To make sure you are getting the right nutrition, your dialysis care team will check several things. They will measure your blood level of a special protein called **albumin**. If your albumin level is too low, you may not be eating enough protein to stay healthy. Another test may be done to check your **nPNA**, or **normalized protein nitrogen appearance**. This is another way to tell if you are eating



enough protein. Ask your dietitian if your albumin and nPNA are on target.

Your dietitian may use a process called **Subjective Global Assessment**, or **SGA**, to check your nutritional health. This involves asking you some questions about your daily diet and checking the fat and muscle stores in your body. Some of the things your dietitian will check include:

- changes in your weight
- changes in your face, arms, shoulders, hands and legs
- your daily food intake
- your activity and energy levels
- problems that might interfere with eating.

For more information, see *Nutrition and Peritoneal Dialysis*.

Changes You May Need to Make

Your dietitian will help you plan your meals to make sure you are getting the right amount of protein, calories and other important nutrients. However, if you still have problems getting the right amount of nutrients from your diet, your **dialysis prescription** may need to be changed, or you may need to take **a nutritional supplement**.

Because dialysis cannot remove all the wastes from your blood, you may need to limit certain nutrients in your diet. Your dietitian will tell you which foods to eat to get the right amounts of the following:

Potassium is found in large amounts in dried fruits, dried beans and peas, nuts, milk, certain fruits and vegetables and salt substitutes. Too high or too low a level of potassium in your blood can be harmful to your heart.

Sodium is a mineral found in large amounts in table salt and foods that have added table salt, such as canned foods, processed meats (ham, bacon, sausage, salami and pastrami), snack foods like crackers and chips, fast foods and restaurant meals. Eating too much sodium makes you thirsty, so you want to drink more fluid. Fluid is anything that is liquid at room temperature including all beverages, ice, ice cream and gelatin. Following your **fluid and sodium allowance** will help prevent too much fluid weight gain while helping to control your blood pressure.

Phosphorus is found in large amounts in many foods including milk, cheese, yogurt, ice cream, dried beans and peas, nuts, peanut butter, chocolate and cola drinks. Too much phosphorus in your blood can cause your bones to become weak and break more easily. Your dietitian will tell you about how best to control the amount of phosphorus in your diet. You will also need to take a special medication called a **phosphate binder** with all your meals and snacks.

Vitamins and minerals can change because of your dialysis treatments. If you are not getting all the vitamins and minerals you need from the foods you eat, you may need to take vitamin or mineral supplements. You should only take what is ordered for you, as some supplements can be harmful to people on dialysis.

Preventing Infections

PD is an excellent option for dialysis patients. However, to avoid problems such as infections, you must follow the steps for PD exactly as you have been taught. The main problem to avoid is an **infection of your peritoneal membrane**. This infection is called **peritonitis**. You must be careful when connecting your catheter to the bag of dialysis fluid, or bacteria (germs) may enter your body. When doing an exchange:

- Make sure the area where you do your exchange is **clean**.
- Make sure you and anyone else in the room wears a **surgical mask**.
- **Do not allow children or pets** into the room.
- **Close** all doors and windows and **turn off** any ceiling fans, air conditioners or heating vents.
- Gather all your supplies before you start your exchange.



- **Scrub your hands** for at least two minutes before each exchange, using a good soap. Your dialysis care team can suggest a soap to use.
- Dry your hands with a **disposable paper towel**. Do not touch anything unrelated to your treatment, not even your skin or your hair. If you do touch something, wash your hands again before continuing.
- **Avoid coughing or sneezing** on your sterile supplies. If this happens, you must start the process over with new supplies.
- Make sure you do your exchanges **exactly as taught** by your training program. **Don't try anything different without asking your dialysis care team about it.**

Recognizing Peritonitis

The main signs of peritonitis are:

- a **cloudy dialysis bag** when you are draining out the used fluid
- unusual **stomach pain**, either mild or severe
- **fever.**

If you notice any of these signs, or if you made a mistake while doing an exchange, **call your doctor or dialysis center right away**. You need prompt care to avoid an infection. If you do not get prompt treatment, and the infection becomes severe, you may have to go to the hospital. In addition, the infection may scar your peritoneal membrane, making PD less effective. In extreme cases, you may have to change to hemodialysis.

Other Infections

Infections can also occur at the place where the catheter leaves your skin, called your **exit site**. You should clean this area at least once a day with soap and water. During training for PD, you learn how and when you should clean this area. You should also check your exit site and catheter every day. If problems occur, you can often catch them in the early stages. Signs of exit site infection are:

- **pus** at the exit site
- **redness** around the exit site
- **swelling** or bulging around the exit site
- **tenderness** or **pain** at the exit site.

Catheter Care

Taking good care of your catheter is also important to prevent infections and enable you to do well on PD. Following are some tips for routine catheter care:

- **Check your catheter** every day for signs of cracking or pulling.
- **Do not wear** tight clothes and belts around the exit site.
- **Wash your hands** with soap and water for at least two minutes and dry them with a disposable paper towel before handling your catheter, and before and after an exchange is made.
- **Tape the catheter** down to your skin.

- Keep the catheter **away from scissors** or other **sharp objects**.
- **Cleanse the catheter** thoroughly with a wash cloth and soap every day.
- Keep a **special dressing** over the exit site if your dialysis care team tells you to do so.
- Do not allow **tugging or pulling** of your catheter.

Treating Your Anemia

Because you have kidney failure, you will probably have **anemia**, or a **low red blood cell count**. Anemia can make you feel very tired and have little energy. In most kidney patients, anemia happens because the kidneys no longer make enough of a hormone called **erythropoietin**, or **EPO**. This hormone tells your bone marrow to make red blood cells. Red blood cells are important because they carry oxygen to all parts of your body.

Treating your anemia has some important benefits for you:

- It decreases your chance of having **heart problems**.
- It increases your **energy level**.
- It improves your **quality of life**.
- It improves your **ability to exercise**.
- It helps you **live longer**.

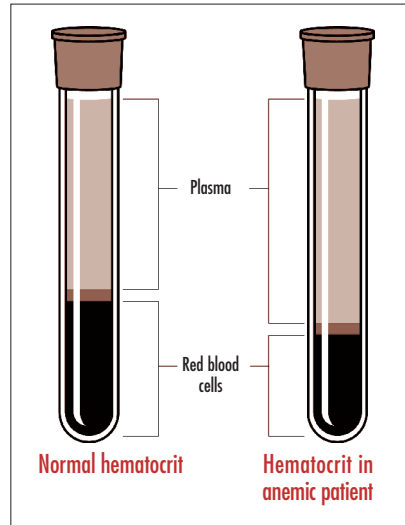
Many kidney patients need treatment for anemia long before they begin dialysis. Treating your anemia early improves your overall health and helps you do better when you need to start dialysis.

The best test to find out if you have anemia is to measure your blood level of **hemoglobin**. Hemoglobin is the part of your red blood cells that carries oxygen to all parts of your body.

A normal hemoglobin level ranges from 12 to 16 for women and from 14 to 18 for men. Another test may be done to check your **hematocrit**. This test tells your doctor **how many red blood cells you have**. A normal hematocrit ranges from about 35 to 47 percent for women and from about 40 to 52 percent for men. People with kidney failure often have hemoglobin levels below 11 and hematocrits below 33 percent. When your hemoglobin and hematocrit are too low, you need treatment for anemia. (See “Your Anemia Treatment Goal” on page 22.)

Taking EPO

Before starting your treatment for anemia, your doctor will do some tests to find out exactly what is causing your anemia. If a low level of EPO is causing your anemia, you will be treated with a man-made form of this hormone. A dose of EPO is usually most effective when given by an injection under the skin, called a **subcutaneous injection**. In some cases, patients can be taught to give themselves their own subcutaneous EPO injections at home. Your doctor will talk with you about the best way for you to receive your EPO.

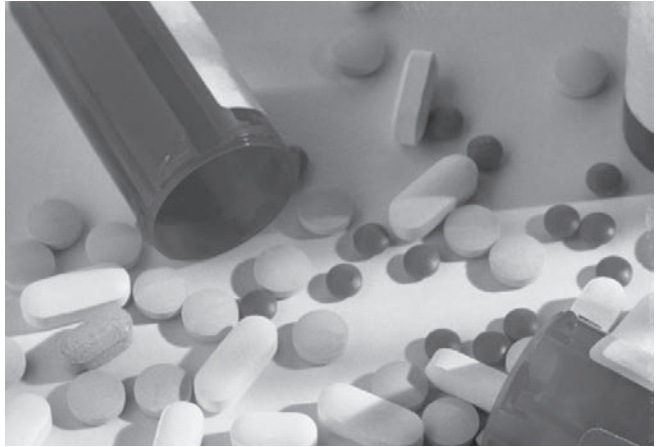


Taking Iron Supplements

Most patients receiving EPO will also need to take **extra iron**. Iron works with EPO to help your body make more red blood cells. Some patients may be able to get enough iron just by taking iron pills. However, iron is usually most effective when it is given by **intravenous**, or **IV, injection**. This means it is given directly into a vein. Your doctor will tell you whether you need IV iron or iron pills. If you need IV iron, you may receive your injection at your dialysis center or your doctor's office.

Your dialysis care team will do two tests to check whether you have enough iron. These tests are called **TSAT** (pronounced tee sat) and **ferritin** (pronounced ferry tin).

- Your TSAT should be at least 20 percent but not more than 50 percent.
- Your ferritin should be at least 100 but not more than 800.



Ask your dialysis care team about your TSAT and ferritin tests. Keep track of these numbers, and if they are not in the target range, discuss this with your dialysis care team.

Your Anemia Treatment Goal

The goal of your anemia treatment is to increase your red blood cell count so you will feel less tired and have more energy. Your treatment goal is to reach a **hemoglobin of at least 11 to 12 and a hematocrit of at least 33 to 36 percent**. This is called your target range. Your dialysis care team will measure your hemoglobin level regularly. Ask your dialysis care team about your results. If they are not in the target range, ask what can be done to improve them. For more information about the treatment for anemia, see *What You Need to Know About Anemia*, available from the National Kidney Foundation.

Treating Bone Disease

People with chronic kidney disease often develop bone disease. This occurs when two important minerals, **calcium and phosphorus**, get out of balance in your body. This causes four small glands in your neck, the **parathyroid glands**, to become more active and release more **parathyroid hormone**, or **PTH**, into your blood. This causes you to lose calcium from your bones. Over time, your bones can become thinner and weaker, causing them to break more easily. Fortunately, bone disease can be treated with diet and medications. You may receive treatment to help prevent bone disease before starting dialysis. Here are some of the things your doctor may prescribe:

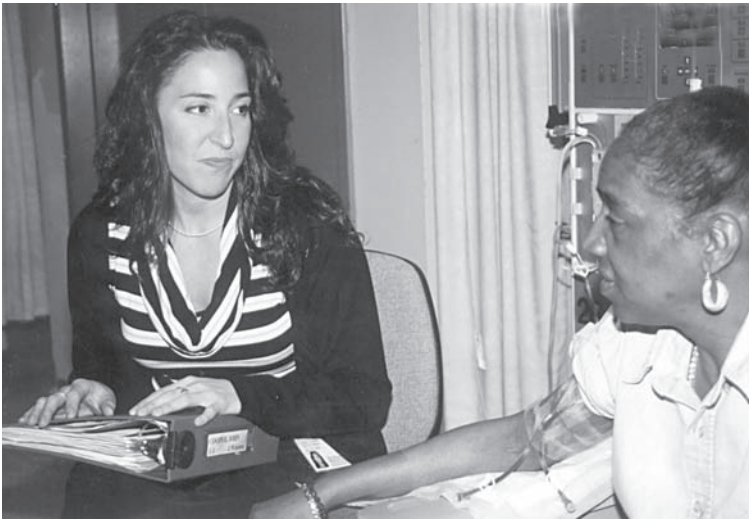
- Limit the amount of foods you eat that are high in phosphorus. (See page 16 for a list of high-phosphorus foods.)
- Take a medication called a **phosphate binder** with all your meals and snacks to prevent high phosphorus levels and provide extra calcium for your bones.
- Take a special prescription form of vitamin D.

You may also want to read *Keeping Bones Healthy in Chronic Kidney Disease*, available from the National Kidney Foundation.

Preventing Heart Problems

People who have chronic kidney disease often have other health problems like high blood pressure, diabetes, anemia (low red blood cell count) and high cholesterol. These problems must be treated and controlled, or they may lead to heart problems. Follow your doctor's advice about treating these conditions, and take all the medications prescribed for you. To help prevent heart problems you may need to:

- Take **high blood pressure medications**.
- Maintain a **normal body weight** to help control your blood pressure, cholesterol and diabetes.
- Follow your **sodium and fluid allowances**.
- **Reduce saturated fat** in your diet by avoiding foods such as gravy, cream sauces, fried foods, fatty meats, whole milk, cheese, butter and chocolate.
- Take a medication to help **lower your cholesterol level**, if prescribed by your doctor.
- Take a hormone, called **erythropoietin**, and **extra iron** to correct anemia.
- Control your **blood sugar levels** if you have diabetes.
- Follow an **exercise program** approved by your doctor.
- **Take the vitamins** prescribed for you, especially folic acid.



Your Role in Your Own Care

Once you have learned all you need to know, your PD supplies will be delivered directly to your home and you will be ready to start your treatment. You will never be on your own, however. You will visit your dialysis center for regular checkups and lab tests. In addition, your center will always be just a phone call away if you have any problems. Still, you are the one who has the **primary responsibility** for your own care. Call your doctor or dialysis center if you notice any of the potential problems outlined in the following chart:

Checking for Problems

What to Check	Signs of Possible Problems	What You Should Do
Weigh yourself each day at about the same time.	A sudden weight gain along with swelling, shortness of breath and an increase in blood pressure is probably due to too much fluid in your body.	Make sure to follow your diet and fluid allowances; speak to your doctor and dietitian about what diet, medications or dialysis prescription might be needed.
	A gradual gain in weight without swelling, shortness of breath and an increase in blood pressure may be due to an increase in muscle or fat.	Speak to your dietitian about whether you need to change your intake of calories.
	Loss of weight along with dizziness and low blood pressure may signify that there is too little fluid in your body.	Speak to your doctor and dietitian about whether you need to drink more fluids or have your dialysis prescription changed.
Check your blood pressure and pulse every day.	An increase in blood pressure and pulse may be due to too much fluid weight gain.	Follow your sodium (salt) and fluid allowances to avoid too much fluid weight gain. Your doctor may want to change your medications to better control your blood pressure.
Check how your dialysate looks when you drain it out.	Your dialysate should be clear and yellow in color. Cloudy dialysate is a sign of infection. You should be able to see the printed words on the bag through the solution. If you can't, your dialysate is cloudy.	Call your doctor or dialysis center right away. You may have been given an antibiotic medication to take in case of infection. Ask if you should start taking it.
	Whitish strands in the dialysate are little clots of protein that have stuck together. They are not serious unless they get large enough to block your tubing or PD catheter.	Call your dialysis center. You may need to inject heparin into your fresh dialysate to clear the fluid; your nurse will tell you how to do this. If the strands do not go away in a day or two, call your dialysis center. This could be a sign of a more serious problem.
	Pinkish appearing dialysate means that some blood is leaking into the dialysis fluid. Some women notice this just before they get their monthly period. It may also occur if you have been exercising or lifting something heavy.	Do not be concerned about a small amount of blood. However, watch the fluid closely and call your dialysis center if it becomes more pinkish or red.
Check yourself for signs of infection.	Unusual stomach pain, fever or cloudy dialysate could mean you have an infection called peritonitis. Peritonitis can become serious very quickly.	Call your doctor or dialysis center right away; follow your doctor's instructions carefully and take all the antibiotic medications ordered for you.

Checklist of Points to Remember

- Take an **active role** in your treatment. You can do a lot of things to help ensure that you are getting the most from your treatment.
- Know the important numbers that tell how much dialysis you are getting. These include your **Kt/V** and **creatinine clearance**. Speak to your dialysis care team if these numbers are not as good as they should be.
- Make sure to **do all your PD exchanges**. Use the full amount of dialysis fluid for the full dwell time prescribed for you. Shortening your treatment adds up and will harm you over the long term.
- Make sure to do all the steps of your treatment **exactly as you have been taught**. This can help prevent infections and enable you to continue to do PD successfully.
- Check your **blood pressure, pulse and weight** every day. Check the **appearance of your dialysate** every time you drain out the used fluid. Report any problems to your doctor or dialysis care team at once. Catching problems early can help prevent serious complications.
- Follow your **recommended diet**. If you are having any problems, ask your renal dietitian for help.
- Don't exceed your **fluid allowances**. Too much fluid weight gain can cause swelling, shortness of breath and increased blood pressure.
- **Avoid salty foods**. Too much salt can make you thirsty and you will want to drink more fluid.
- Take all your **medications** just as they are prescribed for you.

- Make sure you get enough **EPO and iron** to reach your anemia treatment goal. When your hemoglobin is at least 11 to 12 and your hematocrit is at least 33 to 36 percent, you will feel more energetic and able to return to your normal daily activities.
- Ask your doctor about an **exercise program** that is right for you. Exercising on a regular basis can make you feel stronger.
- If you have any questions about your treatment, **do not be afraid to ask** your doctor and dialysis care team. They are there to help you do well.
- Keep track of your important lab results. You can get a copy of the Dialysis Lab Log by calling the National Kidney Foundation. Be sure to speak to your dialysis care team if any of your numbers is not on target.

Other Resources

Here are some other resources from the National Kidney Foundation you may find helpful:

Brochures and Fact Sheets (single copies available free):

General:

- *Keeping Bones Healthy in Chronic Kidney Disease*
- *What You Need to Know About Chronic Kidney Disease*
- *What You Need to Know About Anemia*
- *Kidney Transplant*
- *Planning for Natural Disasters and Other Emergencies: A Guide for Kidney Patients*
- *When Stopping Dialysis Treatment Is Your Choice*

Nutrition:

- *Dining Out With Confidence*
- *Nutrition and Peritoneal Dialysis*
- *How to Increase Calories in Your Special Diet*
- *Phosphorus and Your Special Diet*
- *Potassium and Your Special Diet*
- *Keep Sodium Under Control: How to Spice Up Your Cooking*
- *Vitamins and Minerals in Kidney Disease*

Coping and Rehabilitation:

- *Coping Effectively: A Guide for Patients and Their Families*
- *Financial Resources for Kidney Patients*
- *Sexuality and Chronic Kidney Disease*
- *Staying Fit With Kidney Disease*
- *Travel Tips: A Guide for Kidney Patients and Their Families*
- *Working With Kidney Disease: Rehabilitation and Employment*

Quarterly Newsletter (available free):

- *NKF Family Focus*

7-Part Video Series (available at your dialysis center):

- *People Like Us*

NKF Patient and Family Council (free membership):

- Join other kidney patients around the country and belong to the largest voluntary health organization committed to helping people with kidney disease.
- Membership in the council is a service of the National Kidney Foundation and there is no charge to you.
- For more information about the benefits of membership and to receive a membership application, call 800.622.9010, or write to the National Kidney Foundation at the address listed on the back of this booklet.

Understanding Your Lab Values

Some or all of the following tests may be used to check your nutrition and general health. Ask your doctor and dialysis care team which tests you will have and how often they will be done. If your numbers are not in the normal range, ask how to improve them.

Serum Albumin:

Albumin is a type of protein made from the protein you eat each day. A low albumin level may be caused by not getting enough protein or calories from your diet. A low level of albumin may lead to health problems, such as difficulty fighting off infections. Ask your dietitian how to get the right amount of protein and calories from your diet.

Blood Pressure:

Ask your doctor what your blood pressure should be. If your blood pressure is high, make sure to follow all the steps in your prescribed treatment. These steps may include taking high blood pressure medications, cutting down on the amount of sodium (salt) in your diet, losing weight if you are overweight and following a regular exercise program.

Blood Urea Nitrogen (BUN):

Urea nitrogen is a normal waste product in your blood that comes from the breakdown of protein from foods you eat and from your own body stores of protein. Healthy kidneys remove BUN from your blood, but when kidney function is lost, your BUN goes up. BUN is also removed from your blood by your dialysis treat-

ments. Your BUN goes up from not getting enough dialysis or from eating more protein. It can go down from getting more dialysis or from eating less protein.

Body Weight:

Maintaining a healthy weight is important to your overall health. If you are losing weight without even trying, you may not be getting the right nutrition to stay healthy. Your dietitian can suggest how to safely add extra calories to your diet. On the other hand, if you are slowly gaining unwanted weight, you may need to reduce calories and increase your activity level. A sudden weight gain may also be a problem. If it is accompanied by swelling, shortness of breath and increased blood pressure, it is a sign of too much fluid in your body. You should check your weight at home every morning. Speak to your doctor if your weight changes noticeably.

Calcium:

Calcium is a mineral that is important for strong bones. Ask your doctor what your calcium level should be. To help balance the amount of calcium in your blood, your doctor may ask you to take calcium supplements or a special form of vitamin D. Take only the medications recommended by your doctor.

Cholesterol:

Total

Cholesterol is a fatlike substance found in your blood. A high cholesterol level may increase your risk of having heart and circulation problems. However, a cholesterol level that is too low may mean you are not eating well enough to stay healthy. Ask your doctor if your cholesterol level is in the right range.

HDL

HDL cholesterol is a type of “good” cholesterol that protects your heart. For many dialysis patients, the target level for HDL cholesterol is above 35.

LDL

LDL cholesterol is a type of “bad” cholesterol. A high LDL level may increase your chance of having heart and circulation problems. For many dialysis patients, the target level for LDL cholesterol is below 100. If your LDL level is too high, your doctor may recommend changing your diet and increasing your exercise level.

Serum Creatinine:

Creatinine is a waste product in your blood that comes from the normal function of your muscles. Healthy kidneys remove creatinine from your blood, but when kidney function is lost, your creatinine level goes up. Your dialysis treatments also remove creatinine from your blood. Not getting enough dialysis can cause

your creatinine level to go up, while getting more dialysis causes it to go down. Your creatinine level can also decrease from not eating well over a long period of time.

Creatinine Clearance:

Creatinine clearance is another measure of how well your peritoneal dialysis treatments are removing wastes from your blood. Your dialysis care team will check your weekly creatinine clearance about once every four months to make sure you are getting the right amount of dialysis.

Hematocrit:

Your hematocrit is a measure of the red blood cells your body is making. A low hematocrit can mean you have anemia and need treatment with EPO and extra iron. You will feel less tired and have more energy when your hematocrit is at least 33 to 36 percent.

Hemoglobin:

Hemoglobin is the part of red blood cells that carries oxygen from your lungs to all the tissues in your body. Measuring your hemoglobin level tells your doctor if you have anemia, which makes you feel tired and have little energy. To treat your anemia, you may need to take a hormone called EPO along with iron. The goal of anemia treatment is to reach and maintain a hemoglobin level of at least 11 to 12.

Iron:

TSAT and
Serum Ferritin

Your TSAT (pronounced tee sat) and serum ferritin (pronounced ferry tin) are measures of iron in your body. Your TSAT should be above 20 percent, and your serum ferritin should be above 100. This will help you build red blood cells. Your doctor will recommend iron when needed to reach your target levels.

Kt/V:

Kt/V (pronounced kay tee over vee) is a measure of how well your peritoneal dialysis treatments work to clear wastes from your blood. Getting the right amount of dialysis is important to your overall health and can also affect how well you eat. Your target weekly Kt/V should be no less than 2.0 for CAPD, 2.1 for CCPD and 2.2 for NIPD.

nPNA:

Your nPNA (normalized protein nitrogen appearance) is a test to tell if you are eating enough protein. This measurement comes from complex lab studies that include urine collection and blood work. Your dietitian may ask for an accurate food record to go with this test.

**Parathyroid
Hormone (PTH):**

High levels of parathyroid hormone (PTH) may result from a poor balance of calcium and phosphorus in your blood. This can cause bone disease. Ask your doctor if your PTH level is in the right range. Your doctor may order a special form of vitamin D to help lower your PTH. Caution: Do not take over-the-counter vitamin D unless ordered by your kidney doctor.

Phosphorus:

A high phosphorus level in your blood can lead to weak bones, itching, bone pain and hardening of blood vessels. Ask your doctor what your phosphorus level should be. If your level is too high, your doctor may ask you to reduce your intake of foods that are high in phosphorus and take a phosphate binder with all your meals and snacks.

Potassium:

Potassium is a mineral that helps your heart and muscles work properly. Too high or too low a level of potassium in your blood can weaken muscles and change your heartbeat. Whether you need to change your intake of high-potassium foods varies with each person on peritoneal dialysis. Ask your doctor or dietitian what your potassium level should be. Your dietitian can help you plan your meals to get the right amount of potassium.

Subjective Global Assessment (SGA):

Your dietitian may use SGA to help evaluate your nutritional health. The dietitian will ask you some questions about your daily diet and check your weight and the fat and muscle stores in your face, hands, arms, shoulders and legs. Ask your dietitian about your score on the SGA. If your score is too low, ask how to improve it.

Triglyceride:

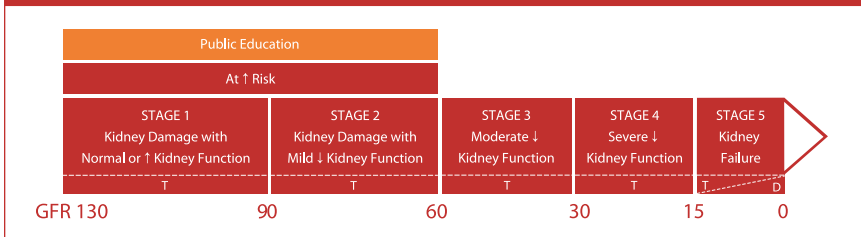
Triglyceride is another type of fat found in your blood. A high triglyceride level, along with high levels of total and LDL cholesterol, may increase your chance of having heart and circulation problems.

Urea Reduction Rate (URR):

URR is another measure of how well your dialysis treatments are working to clear wastes from your blood. It uses blood tests but does not include urine collection. Your target URR should be 65 percent or higher.

More than 20 million Americans—one in nine adults—have chronic kidney disease, and most don't even know it. More than 20 million others are at increased risk. The National Kidney Foundation, a major voluntary health organization, seeks to prevent kidney and urinary tract diseases, improve the health and well-being of individuals and families affected by these diseases, and increase the availability of all organs for transplantation. Through its 47 affiliates nationwide, the foundation conducts programs in research, professional education, patient and community services, public education and organ donation. The work of the National Kidney Foundation is funded by public donations.

Education Along the Continuum of Care



This arrow illustrates the potential scope of content for KLS resources. Lightshaded boxes indicate the scope of content targeted in this resource. GFR = Glomerular Filtration Rate; T = Kidney Transplant; D = Dialysis

PARTNERS IN EDUCATION



United Resource Networks



National Kidney Foundation®



National Kidney Foundation
30 East 33rd Street
New York, NY 10016
800.622.9010

www.kidney.org