Nutrition and Peritoneal Dialysis

National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (NHF-NDOQI)

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 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 is 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	15 to 29
4	Severe reduction in GFR	
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.

Nutrition and Peritoneal Dialysis

If you are receiving peritoneal dialysis treatments, your diet is an important part of your overall care. This booklet will tell you about some things that are important to your diet including:

- Getting the right amount of calories and protein
- Getting and maintaining a healthy body weight
- Other important nutrients in your diet
    - Phosphorus and calcium
    - Sodium and fluids
    - Potassium
    - Vitamins and minerals
- Handling special diet needs
    - Diabetes
    - Vegetarian diets
- How your nutritional health is checked
- Other resources that can help you.

This booklet has been writing for adults who are receiving peritoneal dialysis treatment. The information is based on recommendations made by the National Kidney Foundation's Kidney Disease Outcomes Quality Initiative. These recommendations have been developed to help your health care team provide the best care for you.

Getting the Right Amount of Calories

Getting the right amount of calories is important to your overall health and how well you feel. Calories come from all the foods you eat. They are important because they:

- Give your body **energy**
- Help you maintain a **healthy weight**
- Help your body use protein for **building muscles and tissues**.

When you first start peritoneal dialysis, you may have difficulty eating well and getting enough calories. For a while, the dialysis solutions may give you a sense of fullness in your stomach. Eating smaller meals five or six times a day can provide the calories you need during the first weeks on peritoneal dialysis.

Over time, many people gain unwanted weight on peritoneal dialysis. The dialysis fluid used to exchanges contains a sugar called dextrose. Solutions that contain more dextrose help to remove extra fluid from your blood. However, dextrose is an extra source of calories for the body and can lead to unwanted weight gain. And if you have diabetes, the extra sugar from your dialysis solution can cause an increase in your blood sugar. In addition, following the sodium and fluid instructions from your dietitian can help to prevent the need for the high sugar solutions. Your doctor will choose the dialysis solutions for your fluid removal. Also, your doctor may change your diabetic medications to help control blood sugar.

Working With Your Dietitian

You may feel a bit confused by all the new information about you kidney disease and its treatment. You probably have many questions about your diet. Help is available to you. The staff at your dialysis center includes a registered dietitian with special training in diets for people with kidney disease. This dietitian can answer your questions about your diet and help you plan your meals to get the right foods in the right amounts.

Steps to Take:

- Speak to the registered dietitian at your dialysis center.
- Ask your dietitian to help you plan meals with the right amount of calories
- Keep a diary of what you eat. Show this to your dietitian on a regular basis
- Ask your doctor and dietitian what is your best weight. Weigh yourself each day in the morning
- If you are losing too much weight, ask you dietitian how to add extra calories to your diet.
- If you are slowly gaining too much body weight, ask for suggestions on safely reducing your daily calorie intake and increasing you activity level.
- If you gain weight rapidly, speak to your doctor. A sudden increase in weight, along with swelling, shortness of breath and a rise in your blood pressure may be a sign that you have too much fluid in your body.

Getting the Right Amount of Protein

Before you started dialysis, you may have been on a low protein diet to limit the amount of waste products in your blood. Now that you have begun peritoneal dialysis, your treatments will remove these waste products. Unfortunately, when your dialysis removes the unwanted wastes, it also carries out some good proteins that your body needs. Eating a high protein diet can help you replace the lost protein.

Your body needs the right amount of protein for:

- Building muscles
- Repairing tissue
- Fighting infection

Protein-rich foods to eat daily include:

- Fresh meats
- Poultry (chicken and turkey)
- Fish and seafood
- Eggs or egg whites
- Small amounts of dairy products

Some of these protein-rich foods may also contain a lot of phosphorus a mineral you may need to control in your diet. Your dietitian will help you plan the right amount of each protein source for good health and strength.

Steps to take:

- Ask your dietitian how much protein you need to eat each day.
- Show your daily food diary to your dietitian, and ask if you are eating the right amount of protein.

Other Important Nutrients in Your Diet

Sodium and Fluid

Sodium is a mineral found naturally in foods. It is found in large amounts in table salt and in foods that have added table salt such as:

- Salty seasonings like soy sauce, teriyaki sauce and garlic or onion salt
- Most canned foods (including canned soups and meats)
- Most frozen dinners
- Processed meats like ham, bacon, sausage, and cold cuts
- Salted snack foods like chips and crackers
- Canned or dehydrated soups (like ramen noodle soup)
- Most restaurant meals

Eating too much sodium can make you thirsty and cause you body to hold more fluid. The extra sodium and fluid can cause:

- Swelling or puffiness around eyes, hands or feet
- Fluid weight gain
- Shortness of breath
- A rise in blood pressure
- More work for your heart

Be sure to follow your recommended sodium allowance. Learn to flavor your foods with herbs and spices instead of table salt. ***Do not use salt substitutes containing potassium unless approved by your doctor***.

TIP: try using fresh or dried herbs and spices instead of salt to enhance the flavor of your foods. Also, try adding a dash of hot pepper sauce or a squeeze of lemon juice for flavor.

Phosphorus and Calcium

Phosphorus is a mineral found in all foods. Large amounts of phosphorus are found in:

- Milk, yogurt, and ice cream
- Cheese
- Nuts and peanut butter
- Dried beans and peas
- Dark cola drinks

Eating foods high in phosphorus will raise the amount of phosphorus in your blood. Dialysis cannot remove all this phosphorus. When phosphorus builds up in the blood, calcium is pulled from the bones. Over time, this may cause calcium-phosphorus crystals to build up in your joints, muscles, skin, blood vessels, and heart. These deposits may cause serious conditions such as bone pain, organ or heart damage, poor blood circulation, and skin infection.

To keep blood phosphorus at safe levels, you will need to limit phosphorus-rich foods, and you will need to take a medicine called a phosphate binder. These binders are taken with every meal and snack.

TIP: using nondairy creamers or recommended milk substitutes in place of milk is a good way to lower the amount of phosphorus in your diet.

Foods that are good sources of calcium are also high in phosphorus. The best way to prevent loss of calcium from your bones is to follow a diet that limits high-phosphorus foods and to take a special prescription form of Vitamin D, called calcitriol, to help keep calcium and phosphorus in balance and prevent bone disease. Do not take over-the-counter Vitamin D, however, unless recommended by your kidney doctor.

Potassium

Potassium is another important mineral found in food. Potassium helps your muscles, and heart, to work properly. Too much peritoneal dialysis, you may need to increase or decrease the amount of potassium in your diet. Each person is different. Your blood level of potassium will be checked every month and your dietitian will help you plan a diet that will give you the right amount of potassium from your foods. If your potassium levels are very low, your doctor may ask you to take a potassium supplement to keep the right amount of potassium in your blood. Large amounts of potassium are found in:

- Certain fruits and vegetables (like bananas, oranges, potatoes and some juices)
- Milk and yogurt
- Dried beans and peas
- Most salt substitutes
- Protein-rich foods like meats, poultry and fish.

Vitamins and Minerals

Eating a variety of foods gives your body the vitamins and minerals it needs each day. Your doctor may order special vitamin and mineral supplements for two reasons. Dialysis treatment changes your vitamin needs. Also, your special diet may limit some important food groups. Take only those supplements your kidney doctor orders since certain vitamins and minerals can be harmful if you are on dialysis. Also check with your doctor before using any herbal remedies, as some of these may also be harmful for people with kidney disease.

Handling Special Diet Needs

Diabetes and Your Special Diet

You may need to make only a few changes in your diabetic diet to fit your needs on peritoneal dialysis. You may need to eat more protein and fewer carbohydrates. Your dietitian will help develop a meal plan specially for you.

Vegetarian Diets (plant-based diets)

Most vegetarian diets are not rich in protein. Eating enough calories is an important way to use these smaller amounts of protein for important jobs like building muscle, healing wounds and fighting infections. Talk with your dietitian about the best choices of vegetable protein with lower amounts of potassium and phosphorus.

Also check your blood protein (albumin) levels closely with your dietitian to make sure you are getting the right amount of calories and protein.

How Your Nutritional Health is Checked

There are several different ways for your doctor and dietitian to know if you are eating the right amount of calories or protein. The following sections explain these test. If your results are not as good as they should be, ask how to improve them. For more information, see “Understanding Your Lab Values” at the end of this booklet. You may also want to track your important test results by using a Dialysis Lab Log, available by calling the National Kidney Foundation’s toll-free number 800-622-9010.

Dietary Interviews and Food Diaries

Your dietitian will speak to you at times about your diet. The dietitian may also ask you to keep a record of what you eat each day. If you are not getting enough protein, calories and other nutrients, the dietitian will give you ideas about foods that will improve your diet.

Lab Tests for Protein Balance

Serum Albumin

Albumin is a type of protein found in your blood. Your albumin level will be checked by a blood test each month. If your level is too low, it may mean you are not eating enough protein or calories. If your albumin continues to be low, you have a greater chance of getting infections, being hospitalized and not feeling well.

nPNA (Normalized Protein Nitrogen Appearance)

This is another way to find out if you are eating the right amount of protein. This measurement comes from lab studies that include urine collection and blood work. The results help to check protein balance in your body.

Physical Nutrition Exam

Your dietitian will use a method called subjective global assessment (SGA) to check your body for signs of nutrition problems. This involves asking you some questions about your daily food intake and checking the fat and muscle stores in your body. The dietitian will consider

- Changes in your weight
- Changes in your face, arms, shoulders, hands and legs
- Your food intake
- Your activity and energy levels
- Problems that might interfere with eating

Other Tests That Tell About Your Nutritional Health

Amount of Dialysis You Receive

About every three to six months, tests will be performed to see if the amount of dialysis you are getting is enough to keep you in overall good health. The tests include a 24-hour urine collection, samples of your dialysis solution and a blood test. This information will measure the amount of dialysis you receive, called Kt/V (pronounced kay tee over vee) and creatinine clearance. A lot Kt/V or a low creatinine clearance indicates you are not getting enough dialysis. Low amounts of dialysis can keep you from feeling well, sleeping soundly or eating well. It is very important to do all your dialysis exchanges as ordered by your doctor to keep your Kt/V and creatinine clearance level as high as possible.

Serum Creatinine

Creatinine is a waste product in your blood that comes from the normal function of your muscles. Your creatinine level may rise as your kidney function falls. Creatinine levels can be lowered by dialysis and by any remaining kidney function. Creatinine can also be lowered by not eating enough calories and protein and from weight loss. If your creatinine level is falling, ask your doctor or dietitian whether this change is related to your diet, dialysis or kidney function.

Steps to Take:

- Ask your doctor and dietitian what test will be used to check your nutritional health
- Ask for a copy of the Dialysis Lab Log and track your results
- If your numbers are not in the normal range, ask your doctor and dietitian how you can improve them.

Other Resources

Many of the education resources are available to help you. You may want to check the following publications from the National Kidney Foundation:

Nutrition and Hemodialysis

Nutrition and Transplantation

Dining Out with Confidence: A guide for Kidney Patients

How to Increase Calories in Your Special Diet

Keep Phosphorus Under Control

Keep Sodium Under Control: Spice Up Your Cooking

Vitamins and Minerals in Kidney Disease