

# Nutrition and Peritoneal Dialysis



**NKF** National Kidney  
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*Making Lives Better*

# National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (NKF-K/DOQI™)

The National Kidney Foundation is developing guidelines for clinical care to improve patient outcomes. The information in this booklet is based on the recommended guidelines for nutrition. The K/DOQI 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 Diseases

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 (GFR), which is a measure of your level of kidney function. Your treatment is based on your stage of kidney disease. (See the following table.) Speak to your doctor if you have any questions about your stage of kidney disease or your treatment.

Stage	Description	Glomerular Filtration Rate (GFR)	Action
At increased risk	Risk factors (e.g., diabetes, high blood pressure, family history, older age, ethnic group)	90 or above	Evaluation for CKD Reducing risk for CKD
1	Kidney damage (e.g., protein in the urine) with normal GFR	90 or above	Diagnosis and treatment of other health problems Slowing progression of CKD Reducing risk for heart and blood vessel disease
2	Kidney damage with mild decrease in GFR	60 to 89	Estimating progression of CKD
3	Moderate decrease in GFR	30 to 59	Evaluating and treating complication
4	Severe reduction in GFR	15 to 29	Preparing for treatment of kidney failure
5	Kidney failure	Less than 15	Dialysis or kidney transplant needed

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## 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
- ❖ staying at 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 written for adults who are receiving peritoneal dialysis treatment. The information is based on recommendations developed by the National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (NKF-K/DOQI) to help your health care team provide the best care for you.

If you are receiving hemodialysis treatment, see the National Kidney Foundation booklet, *Nutrition and Hemodialysis*. For more information about diets for transplantation, see *Nutrition and Transplantation*. If you have chronic kidney disease but are not on dialysis, see *Nutrition and Chronic Kidney Disease*.

## 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 for 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 also have diabetes, the extra sugar from your dialysis solution can cause an increase in your blood sugar. The registered dietitian at your dialysis center can help you plan meals to prevent extra weight gain and high blood sugar. In addition, following the sodium and fluid instructions from your dietitian can help to prevent the need for 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 your 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 your **ideal body weight** should be. Weigh yourself each day in the morning.
- ❖ If you are **losing too much weight**, ask your 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 your 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 higher 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 include:

- ❖ fresh meats
- ❖ poultry (chicken and turkey)
- ❖ fish and other 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. (For more information about phosphorus, see page 9.)

### 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 Fluids*

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 and some frozen foods
- ❖ processed meats like ham, bacon, sausage and cold cuts
- ❖ salted snack foods like chips and crackers
- ❖ canned or dehydrated soups (like packaged noodle soup)
- ❖ most restaurant and take-out foods.

Eating too much sodium **can make you thirsty** and cause your body to hold onto 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.

Follow your recommended sodium allowance, but give yourself time to adjust to the flavor of less salt on foods. 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.

Your doctor or dietitian will help you learn the **right amount of fluid** to drink each day. A sudden increase in weight, along with swelling, shortness of breath or a rise in your blood pressure may be signs that you are drinking too much. Tell your health care team if you are having any of these problems. Check your weight at the beginning of each treatment. Ask your dietitian for creative ways to cut down on the amount of fluid you are drinking.

### **What is Fluid?**

*Fluid is any food or beverage that is liquid at room temperature. Some examples are:*

- ❖ ice
- ❖ beverages you drink like coffee, tea, sodas, juices and water
- ❖ frozen desserts such as ice cream, sherbet or popsicles
- ❖ gelatin
- ❖ gravy and soups

### ❖ **Phosphorus and Calcium**

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

- ❖ dairy products such as milk, cheese, yogurt, ice cream and pudding

- ❖ nuts and peanut butter
- ❖ dried beans and peas such as kidney beans, split peas and lentils
- ❖ beverages like cocoa, beer and 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 your bones. Over time, this may cause bones to become weak and break easily. It may also 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, damage to the heart and other organs, poor blood circulation and skin ulcers.

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

**TIP:** Using non-dairy creamers or recommended milk substitutes in place of milk is a good way to lower the amount of phosphorus in your diet.

**Calcium** is a mineral that is important for strong bones. However, 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 phosphate binders. Your doctor may also recommend that you take calcium supplements and a **special prescription form of vitamin D**, to help keep calcium and phosphorus in balance and prevent bone disease. Do not take over-the-counter vitamin D unless recommended by your kidney doctor.

#### ❖ *Potassium*

Potassium is another important mineral found in food. Potassium helps your muscles and heart work properly.

**Too much or too little potassium in your blood can be dangerous.** With 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, melons, oranges, potatoes, tomatoes and some juices)
- ❖ milk and yogurt
- ❖ dried beans and peas
- ❖ most salt substitutes
- ❖ protein-rich foods like meats, poultry, pork and fish.





### ❖ *Vitamins and Minerals*

Eating a wide variety of foods gives your body the vitamins and minerals it needs each day. In addition to a healthy diet, your doctor may order special vitamin and mineral supplements for two reasons. Kidney disease and dialysis treatment changes your vitamin and mineral needs. Also, your special diet may limit some important food groups. Take only those supplements your 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 especially 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 tests. If your results are not what they should be, ask how to improve them. You may also want to track your important test results by using the Dialysis Lab Log, available by calling the National Kidney Foundation's toll-free number (800) 622-9010.

### ❖ *Dietary Interview 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 suggestions about food choices 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. The nPNA result comes from lab studies that include a urine collection and blood work. Your nPNA helps 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, shoulders, arms, 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 urine collection, samples of your dialysis solution and a blood test. This information will enable your dialysis care team to measure the amount of dialysis you receive, called **Kt/V** (pronounced kay tee over vee) and creatinine clearance. A low 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 well 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 levels 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, but can be lowered by dialysis and by any remaining kidney function. Creatinine levels may fall if you do not get enough calories and protein as well as 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 tests will be used to check your nutritional health.
- ❖ Track your results in your Dialysis Lab Log.
- ❖ If your numbers are not in the normal range, ask your doctor and dietitian how you can improve them.

## Other Resources

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

*Nutrition and Chronic Kidney Disease*

*Nutrition and Hemodialysis*

*Nutrition and Transplantation*

*Dining Out with Confidence: A Guide for  
Kidney Patients*

*How to Increase Calories When You Have Chronic  
Kidney Disease*

*Phosphorus and Your Kidney Diet*

*Potassium and Your Kidney Diet*

*Keep Sodium Under Control: How to Spice Up  
Your Cooking*

*Vitamins and Minerals in Kidney Disease*

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*More than 20 million Americans—one in nine adults—has 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 51 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.*

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