

National Kidney  
Foundation™

## Nutrition and Chronic Kidney Disease



## 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 K/DOQI™ recommended guidelines for nutrition. All 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 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 (GFR), 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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## Nutrition and Chronic Kidney Disease

When you have chronic kidney disease, diet is an important part of your treatment plan. Your recommended diet may change over time if your kidney disease gets worse. A number of tests should be done to "keep tabs" on your overall nutritional health. Your doctor can also refer you to a registered dietitian who will help you plan your meals to get the right foods in the right amounts. This booklet will tell you about some things that are important to your diet including:

- getting the right amount of **calories and protein**
- other important nutrients in your diet
  - **sodium**
  - **phosphorus**
  - **calcium**
  - **potassium**
  - **fluids**
  - **vitamins and minerals**
- staying at a healthy **body weight**
- 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 with chronic kidney disease who are not on dialysis and have not received a kidney transplant. The information is based on recommendations developed by the National Kidney Foundation's Kidney Disease Outcomes Quality Initiative to help your doctor provide the best care for you. If you are already receiving hemodialysis, see the National Kidney Foundation booklet *Nutrition and Hemodialysis*. If you are a peritoneal dialysis patient, see *Nutrition and Peritoneal Dialysis*. If you have received a kidney transplant, see *Nutrition and Transplantation*.

## Your Changing Diet

As a patient with chronic kidney disease, your recommended diet may change over time, depending on how much kidney function you have. Your glomerular filtration rate, or GFR, is the best way to track your level of kidney function. Your doctor can estimate your GFR from the results of a simple blood test for creatinine along with your age, sex and body size. If your kidney disease progresses, and your GFR continues to decrease, the amount of protein, calories and other nutrients in your diet will be adjusted to meet your changing needs. If dialysis or a kidney transplant is needed eventually, your diet will be based on the treatment option you choose. Your doctor can refer you to a registered dietitian who will explain the changes you need to make in your diet and help you choose the right foods.



## Getting the Right Amount of Calories

Getting enough calories is important to your overall health and well-being. Calories are found in all the foods you eat. They are important because they:

- give your body **energy**
- help you stay at a **healthy weight**
- help your body use protein for **building muscles and tissues**.

Because your recommended diet may limit protein, you may also be cutting down on an important source of calories. As a result, you may need to get extra calories from other foods. Your doctor can refer you to a registered dietitian who will help you plan your meals to get the right amount of calories each day. Your dietitian may recommend using more simple carbohydrates like sugar, jam, jelly, hard candy, honey and syrup. Other good sources of calories come from fats such as soft (tub) margarine, and oils like canola or olive oil, which are low in saturated fat and have no cholesterol. You should talk with your dietitian about the best way to get the right amount of calories and keep your blood sugar in control if you have diabetes.

Maintaining a healthy weight is also important. People who have chronic kidney disease often need to gain weight or remain at their current weight. If you need to lose weight, your dietitian will teach you how to lose it slowly and carefully without risking your health.



## Steps to Take

- Ask your doctor about a referral to a **registered dietitian** who specializes in diets for kidney patients.
- Ask your dietitian to **help you plan meals** with the right amount of calories.
- Keep a **diary** of what you eat each day. Show this to your dietitian on a regular basis.
- Ask your doctor and dietitian what your **ideal body weight** should be, and weigh yourself each day in the morning.
- If you are **losing too much body weight**, ask your dietitian how to add extra calories to your diet.
- If you are slowly **gaining too much weight**, ask your dietitian for suggestions on how to safely reduce your daily calorie intake and increase 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

Getting the right amount of protein is important to your overall health and how well you feel. Your body needs the right amount of protein for:

- building muscles
- repairing tissue
- fighting infections.

Your doctor may recommend that you follow a diet that has controlled amounts of protein. This may help decrease the amount of wastes in your blood and may help your kidneys to work longer.

Protein comes from two sources. You will need to get some protein each day from both of these sources:

- **Animal sources**, such as eggs, fish, chicken, red meats, milk products and cheese.
- **Plant sources**, such as vegetables and grains.

### 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.

#### 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. Your doctor can refer you to a registered dietitian with special training in kidney disease. This dietitian can answer your questions about your diet and can help you plan your meals to get the right foods in the right amounts.*

## Other Important Nutrients in Your Diet

To feel your best each day, you may need to change the amounts of some of the following nutrients in your diet. Your dietitian will help you plan your meals to get the right amounts of each.

### Sodium

Kidney disease, high blood pressure and sodium are often related. Therefore, **you may need to limit the amount of sodium in your diet.** Your doctor will let you know if you need to cut back on sodium. If you do, your dietitian can teach you how to select foods that are lower in sodium. Learn to read food labels so you can make lower sodium choices when you shop for foods. 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:

- 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
- most restaurant and take-out foods
- canned or dehydrated soups (like packaged noodle soup).

You may need to limit the use of **salt substitutes that are high in potassium.** Speak to your doctor and dietitian about this.

#### TIP

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

## Phosphorus

Your kidneys may not be able to remove enough phosphorus from your blood. This causes the level of phosphorus in your blood to become too high. A high blood phosphorus level may cause your skin to itch and the loss of calcium from your bones. Your bones can become weak and may break easily. **Eating fewer foods that are high in phosphorus** will help lower the amount of phosphorus in your blood. Your dietitian will help you choose foods that are lower in phosphorus.

Phosphorus is found in large amounts in the following:

- dairy products such as milk, cheese, pudding, yogurt and ice cream
- dried beans and peas such as kidney beans, split peas and lentils
- nuts and peanut butter
- beverages such as hot chocolate, beer and dark cola drinks.

Your doctor may also prescribe a type of medication called a **phosphate binder** for you to take with all your meals and snacks.

### TIP

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

## Calcium

Calcium is a **mineral** that is important for building **strong bones**. However, foods that are good sources of calcium are also high in phosphorus. To keep your calcium and phosphorus levels in balance and to prevent the loss of calcium from your bones, you may need to follow a diet that limits phosphorus-rich foods and take phosphate



binders. Your doctor may also ask you to take **calcium supplements** and a special prescription form of **vitamin D**. Take only the supplements or medications recommended by your doctor.

## **Potassium**

Potassium is an important mineral in the blood that **helps your muscles and heart** work properly. **Too much or too little potassium in the blood can be dangerous.** Whether or not you need to change the amount of high-potassium foods in your diet depends on your **stage of kidney disease** and whether you are taking any **medications that change the level of potassium in your blood.** (For more information on the stages of chronic kidney disease, see the table on the inside front cover. You may also contact the NKF to obtain *About Chronic Kidney Disease: A Guide for Patients and Their Families.*) Ask your doctor if



your potassium level is normal. Your doctor may ask you to take potassium supplements or other medications to balance the amount of potassium in your blood. Take only the supplements recommended by your doctor. Your dietitian can help you plan a diet that will give you the right amount of potassium from your food.

## **Fluid**

In general, you **do not need to limit the amount of fluids you drink in the earlier stages of kidney disease.** (If you don't know your stage, ask your doctor and contact the NKF for additional information.) If your kidney disease gets worse, your doctor will let you know when you need to limit fluids and how much fluid is okay for you each day.

## **Vitamins and Minerals**

Vitamins and minerals come from a variety of foods you eat each day. If your diet is limited, you may need to take special vitamins or minerals. **Take only the vitamins and minerals your doctor recommends for you.** Certain vitamins and minerals may be harmful

to people with chronic kidney disease. Also check with your doctor before taking any herbal remedies as some of these may also be harmful to people with kidney disease. Cooking with herbs is a safe choice, and can often be used instead of salt to flavor foods. Check with your doctor and dietitian about the right vitamins and minerals for you.

### **Steps to Take**

- Ask your doctor and dietitian which nutrients you need to limit in your diet.
- Ask your dietitian for help in planning your meals to get the right amount of each nutrient in your daily diet.
- Learn to read food labels so you can make lower sodium choices when you shop for foods.
- Ask your dietitian for tips about flavoring your foods with herbs and spices in place of table salt.
- Take only those supplements, medications, vitamins and minerals recommended by your doctor.

### **Some Tips to Help With Your Diet**

- Non-dairy creamers can be used in place of milk in cereals, coffee and many sauces.
- Labels on food packages only give you information about some of the nutrients in your diet. Read labels and ask your dietitian for more information.
- Herbs, spices, table wine and special vinegar can be used instead of salt to make your food flavorful. Try purchasing or growing fresh herbs. Ask your dietitian for a list of herbs and spices that blend with different types of foods.



## 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 as a kidney patient. If your doctor suggests that you eat less protein, your diet may need to include more carbohydrates or high-quality fats to give you enough calories. Work with your dietitian to design a meal plan especially for you. Check your blood sugar levels often, and contact your doctor if your levels are too high or too low.

### ■ *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 infection. Talk with your dietitian about the best choices of vegetable protein with lower

amounts of **potassium** and **phosphorus**. Also, monitor your blood protein (albumin) levels closely with your dietitian to make sure you are getting the right amount of protein and calories.

## **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. This section will explain these tests and methods. If your kidney disease gets worse, and/or your nutritional health changes, you may need to have these tests more often. Ask your doctor and dietitian about your test results. If your results are not as good as they should be, ask how to improve them. You may also want to track your test results by using the 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 eating the right amount of protein, calories and other nutrients, your dietitian will give you ideas about food choices that will help to 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. If your level is too low, it may mean you are not eating enough protein and/or calories. If your albumin level continues to be low, you have a greater chance of getting an infection, being hospitalized and generally not feeling well.

#### **nPNA (normalized protein nitrogen appearance)**

This is another way to determine if you are not eating the right amount of protein. The nPNA result comes from lab studies that

include urine collection and blood work. Your nPNA helps to check the protein balance in your body.

### Physical Nutrition Exam

Your dietitian may use a method called **Subjective Global Assessment (SGA)** to check your body for signs of nutrition problems. This involves asking you questions about your food intake and looking at the fat and muscle stores in your body. The dietitian will consider:

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

### Steps to Take

- Ask your doctor and dietitian which tests will be used to check your nutritional health.
- Track your own test results using the Report Card. Discuss your results with your doctor and dietitian.

## **Other Resources**

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

### **General**

*About Chronic Kidney Disease: A Guide for Patients and Their Families*

*Choosing a Treatment for Kidney Failure*

*Kidney Transplant*

### **Nutrition**

*Enjoy Your Own Recipes Using Less Protein*

*How to Increase Calories In Your CKD Diet*

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

*Nutrition and Transplantation*

*Nutrition and Hemodialysis*

*Nutrition and Peritoneal Dialysis*

*Phosphorus and Your CKD Diet*

*Potassium and Your CKD Diet*

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

*Use of Herbal Supplements in Chronic Kidney Disease*

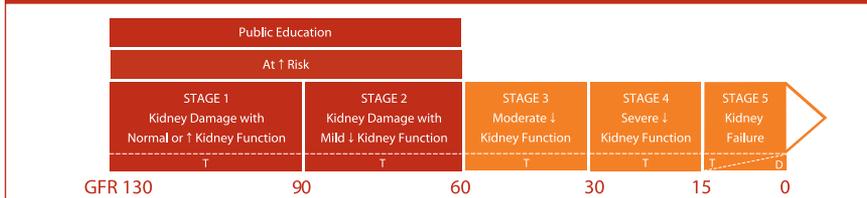
*Vitamins and Minerals in Kidney Disease*

## Questions for My Dietitian

## **Questions for My Doctor**

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

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## PARTNERS IN EDUCATION



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