Nutrition and Kidney Failure (Stage 5)

Are You Getting What You Need?
Stages of Chronic Kidney Disease

There are five stages of chronic kidney disease. They are shown in the table below. Your doctor determines 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. Speak to your doctor if you have any questions about your stage of kidney disease or your treatment.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>Glomerular Filtration Rate (GFR)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kidney damage (e.g., protein in the urine) with normal GFR</td>
<td>90 or above</td>
</tr>
<tr>
<td>2</td>
<td>Kidney damage with mild decrease in GFR</td>
<td>60 to 89</td>
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<tr>
<td>3</td>
<td>Moderate decrease in GFR</td>
<td>30 to 59</td>
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<tr>
<td>4</td>
<td>Severe reduction in GFR</td>
<td>15 to 29</td>
</tr>
<tr>
<td>5</td>
<td>Kidney failure</td>
<td>Less than 15</td>
</tr>
</tbody>
</table>

*Your GFR number tells your doctor how much kidney function you have. As chronic kidney disease progresses, your GFR number decreases.
Why is good nutrition important for people with kidney failure?

Eating healthy is important to us all, but it is even more important if you have kidney failure. Why? Because good nutrition gives you energy to:

- do your daily tasks
- prevent infection
- build and maintain muscle
- help maintain a healthy weight

Will I need to change my diet if I have kidney failure?

There is no one diet that is right for everyone with kidney failure. What you can or cannot eat depends on many factors and may change over time. Your doctor can refer you to a dietitian with special training who can teach you how to plan meals that are right for you.
If you need help finding a dietitian who specializes in chronic kidney disease (CKD), you can ask your doctor for a referral or contact the American Dietetic Association at 800.877.1600 (www.eatright.org).

What are the basics of good nutrition?

Key nutrients are:
- protein
- calories
- vitamins
- minerals

You will need a diet that gives you the right amounts of protein, calories, vitamins and minerals each day. This will help you to stay healthy.
Why do I need protein?

Protein is an important nutrient. Your body needs protein to help build muscle, repair tissue and fight infection. Before you started dialysis, you may have needed to be on a limited-protein diet to prevent wastes from building up in your blood. Now that you have begun dialysis, your diet might include more protein. Getting the right amount of protein is important to your overall health and how well you feel. You get protein from:

- red meats (beef, pork, veal, lamb)
- poultry (chicken and turkey)
- fish and other seafood
- eggs
- milk and cheese
- vegetables and grains

Some of these high-protein foods may also contain a lot of phosphorus, a mineral you may need to control in your diet. Your dietitian can help you plan how much protein you need to eat each day. (For more information on phosphorus, see pages 14–15).
There are two kinds of proteins. “Higher quality” proteins are found in animal products like meat, poultry, fish, eggs and dairy products. They are the easiest proteins for your body to use. “Lower quality” proteins are found in vegetables and grains. A well-balanced diet for kidney patients should include both kinds of proteins every day.

**Why do I need calories?**

Calories are like fuel—they provide your body with the energy you need to live. They are important because they:

- help you stay at a healthy body weight.
- give you energy to do your daily tasks and remain active.
- help to keep the protein you eat from being wasted. (Without enough calories, your body will “waste” protein to provide you with energy, instead of using protein to build your muscles and tissues.)

If you are not getting enough calories from your diet, you may need to eat extra sweets 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. It is important to plan meals that give you enough calories each day. Otherwise your
body may not have the energy you need to stay healthy. Your dietitian can help you do this.

**TIP**

- If you have diabetes and kidney failure, ask your dietitian how to get the right amount of calories and keep your blood sugar in control.

- If you are on peritoneal dialysis, you may have difficulty eating enough protein and calories. When you first begin peritoneal dialysis, 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 nutrients you need during the first weeks on peritoneal dialysis.
Why do I need vitamins and minerals?

Do you know how most people get enough vitamins and minerals to stay healthy? They eat a wide choice of foods each day. However, kidney disease and dialysis change the amount of vitamins and minerals your body needs. Also, your special diet may limit some food choices that would normally give you important vitamins and minerals. If so, you may need to take special vitamins or minerals instead. Be sure to:

- take only the vitamins and minerals your doctor recommends, because some vitamins and minerals found in stores may be harmful to people with kidney failure.
- check with your doctor before taking any herbal supplements or medicines you can buy at the store without a doctor’s prescription. Some may be harmful to people with kidney failure.

How will I know if I am getting enough calories and nutrients?

Your doctor will give you blood tests and urine tests. These will help show your doctor whether you are getting enough nutrients. Your dietitian may also interview you to find out about the foods you eat. You may also be asked to keep a food diary. To learn more about the tests your doctor and dietitian will use to check your nutrition, see pages 22–25.
As a kidney patient, it may be difficult to get enough nutrients from food, especially if you are on a limited-protein diet. Many people with kidney disease also find it hard to eat enough calories each day. Nutritional supplements can help you get the calories and nutrients you need. Supplements can come in the form of liquid drinks, shakes, juices, bars, soups, cookies, puddings and more. There are even some nutritional supplements that are made just for people with early kidney disease, diabetes or kidney failure.
Some examples of supplements made specifically for people on dialysis are:

- Nepro® with CarbSteady
- Novasource® Renal
- Nutren® Renal
- Renalcal®
- Re/Gen®

Some examples of supplements suitable for people with diabetes are:

- Glucerna® Shakes or Bars
- Resource® Diabetic
- Re/Gen® “Low Sugar”

Some examples of standard supplements that supply extra calories, protein and nutrients are:

- Boost Plus® or Boost® Fruit Flavoured Beverage
- Carnation® Instant Breakfast® Juice or Carnation® Instant Breakfast® VHC
- Resource® Fruit Beverage (formally called “Resource Breeze”)
- Enlive®
- Ensure® Hi Pro
- Boost® High Protein
These are just a few of the products available. Discuss with your doctor or dietitian which ones would be most beneficial for you. Do not take any supplements without the advice of your doctor or dietitian.

**TIP**

- Learn to read food labels so you know what you are eating. Reading labels can help you shop for foods with lower sodium and to check for “added” nutrients that may not be best for you.

- Herbs, spices, table wine and special vinegar can be used instead of salt to make your food flavorful. Try purchasing or growing fresh herbs. Try adding a dash of hot pepper sauce or a squeeze of lemon juice for flavor. Ask your dietitian for a list of herbs and spices that blend with different types of foods.

- Non-dairy creamers can be used in place of milk in cereals, coffee and many sauces. This is a good way to lower the amount of phosphorus in your diet.

**How will I know if I need a nutritional supplement?**

Your doctor and dietitian will tell you if you need to take nutritional supplements. If you find you are losing weight or feeling weak, you may want to ask about nutrition supplements. Use only the supplements recommended by your doctor or dietitian.
Remember, not all people with kidney disease have the same dietary needs. Depending on what you eat, you may need less protein, but someone else might need extra protein. Or, you may need extra calories, but someone else might need less. Your dietitian will help you choose the right supplements for you.

**Will I need to control any other nutrients as well?**

You may need to balance other important nutrients, too. They are:

- sodium
- phosphorus
- calcium
- potassium
- fluid
Sodium

Sodium is a mineral found in most foods. It affects blood pressure and water balance in your body. Healthy kidneys can get rid of extra sodium in your body. But if your kidneys do not work well, sodium and fluid build up in your body. This can cause high blood pressure and other problems like swelling of your ankles, fingers or eyes. You may need to limit sodium in your diet. Your doctor or dietitian will tell you if you need to limit sodium. Each person may need different amounts of sodium.

Sodium 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 frozen dinners (unless they say low sodium)
- 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 foods, take-out foods and fast foods
Your dietitian can teach you how to choose foods that are lower in sodium. Learning how to read food labels can help you choose foods with less sodium. **Do NOT use salt substitutes containing potassium unless approved by your doctor.**

**TIP**

Try fresh or dried herbs and spices instead of table salt to enhance the flavor of foods. Salt is a flavor booster. When you limit salt, you may have to use more herbs and spices to get more flavor. Also, try adding a dash of hot pepper sauce or a squeeze of lemon juice for flavor.

**Phosphorus**

Phosphorus is a mineral found in most 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 such as cocoa, beer and dark cola drinks

Eating high-phosphorus foods can raise the level of phosphorus in your blood. Dialysis cannot remove all of this extra phosphorus. What happens when phosphorus builds...
up in your blood? Your blood calcium levels drop and calcium is pulled from the bones. Over time, your bones can become weak and break easily. A high level of phosphorus in your blood may also cause calcium to build up in your blood vessels, heart, joints, muscles and skin where it doesn’t belong. This may cause serious problems such as:

- damage to the heart and other organs
- poor blood circulation
- bone pain
- skin ulcers

To keep phosphorus at safe levels in your blood, you may need to limit phosphorus-rich foods. You may also need to take a type of medicine called a phosphate binder. These binders are taken with your meals and snacks. Your doctor or dietitian will tell you if you need to limit high-phosphorus foods or take phosphate binders.
Using non-dairy creamers and recommended milk substitutes in place of milk is one 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. The best way to prevent loss of calcium from your bones is to limit high-phosphorus foods. You may also need to take phosphate binders and avoid eating calcium-fortified foods. Your doctor may also have you take a special form of vitamin D to help keep calcium and phosphorus levels in balance and to prevent bone disease. Do not take over-the-counter vitamin D or calcium supplements unless they are recommended by your kidney doctor.
Potassium

Potassium is another important mineral found in most foods. Potassium helps your muscles and heart work properly. Large amounts of potassium are found in:

- certain fruits and vegetables (like bananas, melons, oranges, potatoes, tomatoes, dried fruits, nuts, avocados, deep colored and leafy green vegetables, and some juices)
- milk and yogurt
- dried beans and peas
- most salt substitutes
- protein-rich foods such as meat, poultry, pork and fish

Too much or too little potassium in the blood can be dangerous. Not everyone needs the same amount of potassium. Some people on dialysis need more; others need less. Each person is different. How much you need depends on many factors, including whether you are taking any medicine that changes the level of potassium in your blood.
**TIP**

How do you know if your potassium is normal? A simple blood test can check your potassium level. If it is not normal, you may need to take:

- potassium supplements
- special medicine to help get rid of too much potassium

Take only the supplements your doctor recommends. Your dietitian can help you plan a diet that will give you the right amount of potassium.

**Fluid**

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

- ice
- beverages like coffee, tea, sodas, juices and water
- frozen desserts like ice cream, sherbet or popsicles
- gelatin
- gravy and soup
If you have kidney failure, you may need to limit how much fluid you drink each day. Your doctor or dietitian will help you plan the right amount of fluid to drink each day. You may be drinking too much fluid if you have:

- a sudden increase in weight
- swelling or puffiness around the eyes, hands or feet
- shortness of breath
- a rise in blood pressure

Tell your dialysis care team if you are having any of these problems. Check your weight at the beginning of each treatment. The amount of weight you gain between one dialysis treatment and the next tells you how much fluid you are drinking. The dialysis staff will tell you if you are gaining too much fluid weight. Ask your dietitian for creative ways to cut down on the amount of fluid you are drinking.
Some people on peritoneal dialysis may gain unwanted weight over time. This happens because 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 contains calories which can lead to unwanted weight gain. And if you have diabetes, the extra sugar from your dialysis solution can cause your blood sugar to rise. What can you do to help prevent unwanted weight gain or high blood sugar?

■ Ask the registered dietitian at your dialysis center for help planning meals that will prevent extra weight gain and high blood sugar.

■ If you’ve been told to limit sodium and fluid, be sure to follow these instructions carefully. This can help prevent the need for higher sugar solutions in your dialysis fluid.

■ Ask your doctor if you need to change your diabetic medications to help control blood sugar.
What if I have diabetes?
You may need to make only a few changes in your diabetic diet if you have kidney failure. For example, you may need to:
- drink less milk
- eat fewer potassium-rich fruits and vegetables
- eat more protein
- eat fewer carbohydrates

Work with your dietitian to make a meal plan that is right for you. Ask your doctor how to test your blood sugar level. Check your levels often and try to keep your levels under control. With kidney failure, your dosage of insulin or other medications may need to change. Contact your doctor if your levels are too high or too low.

What if I’m a vegetarian?
Most vegetarian diets are not rich in higher quality protein. Eating a variety of foods and getting enough calories can help. Without enough calories, your body will break down the protein you eat to create energy instead. If protein is broken down, more waste products build up in your blood. Dialysis cannot remove all of these waste products. Ask about ways to check that the amount of protein you are eating is right for you. Talk with your dietitian about the best sources of vegetable protein with lower
amounts of potassium and phosphorus. Your doctor or dietitian can check your blood to make sure you are getting the right amount of protein and calories.

**What if I need help planning meals?**

Your doctor can refer you to a registered dietitian with special training in kidney disease. This dietitian can:

- help you plan meals that will give you the right nutrients in the right amounts
- explain why diet changes you need to make are important
- answer your questions

**TIP**

You may be eligible for nutrition counseling with a dietitian under Medicare or under your health insurance plan.

**How is my nutritional health checked?**

You will be checked regularly by your doctor and dietitian to make sure you are getting good nutrition. Some tests are:

- **Physical Nutrition Exam**
  
  Your dietitian may give you an exam to check your body for signs of nutrition problems. This exam is called a *Subjective Global Assessment* (SGA). Your dietitian asks you questions about your food intake and looks at the fat
and muscle stores in your body. The dietitian notes:

- 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

**Dietary Interviews and Food Diaries**

Your dietitian asks about your diet. You might also be asked to keep a diary of everything you eat each day. These tests help your dietitian see if you are eating the right amount of protein, calories, vitamins and minerals.

**Serum Albumin**

Albumin is a type of protein in your blood. It is checked by a blood test. If your albumin level is too low, it may mean you are not eating enough protein or calories. Or, it may mean that albumin is being lost in the urine, in
which case eating more protein won’t help. If your albumin level continues to be low, you have a greater chance of getting an infection, not healing properly, not feeling well, and being hospitalized. Your doctor or dietitian will tell you if you need extra protein.

■ nPNA (normalized protein equivalent of nitrogen appearance)

Your nPNA estimates how much protein you are eating. It helps your doctor and dietitian check to see if you are eating the right amount of protein. The nPNA result comes from urine collection and blood work.

■ Amount of Dialysis You Receive

You need the right amount of dialysis each month to stay healthy. Without enough dialysis, you may not feel well, sleep well or eat well. How does your doctor know if you are getting enough treatments? Blood is tested at
the beginning and at the end of one of your dialysis treatments.

A urine sample might also be taken. This information provides a way to measure dialysis and is called Kt/V (pronounced “kay tee over vee”) and urea reduction ratio (URR). A low Kt/V or a low URR may mean that you are not getting enough dialysis. To keep your Kt/V and URR levels as high as possible, it is very important to come to all of your treatment sessions and stay for the full treatment time as ordered by your doctor.

**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 during dialysis and by any remaining kidney function. Creatinine can also be lowered by not eating enough calories and protein. If your creatinine level is decreasing, ask your doctor or dietitian whether this change is related to your diet, your dialysis or your kidney function.

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**TIP**

- Ask your doctor and dietitian which tests will be used to check your nutritional health.
- Ask for a copy of the Dialysis Lab Log or your lab report. Track your results.
- If your numbers are not as they should be, ask your doctor and dietitian how you can improve them.
Where can I get more information?

You can speak to your doctor or other members of the health care team, or you can call the National Kidney Foundation for information. To learn more about kidney disease, you may also want to read these free publications from the National Kidney Foundation.

Brochures:

About Chronic Kidney Disease: A Guide for Patients and their Families (11-50-0160)

Dining Out with Confidence: A Guide for Kidney Patients (11-10-0803)

GFR (Glomerular Filtration Rate): A Key To Understanding How Well Your Kidneys Are Working (11-10-1813)

Keeping Your Heart Healthy on Dialysis: What You Should Know About Lipids (11-50-2107)

Nutrition and Transplantation (1-10-0404)

Your Kidneys: Master Chemists of The Body (11-10-0103)
Fact Sheets:

Fact sheets can be found online at: www.kidney.org/atoz/

- How to Increase Calories in Your CKD Diet
- Phosphorus and Your CKD Diet
- Potassium and Your CKD Diet
- Sodium and Your CKD Diet: How to Spice Up Your Cooking
- Vitamins and Minerals in Kidney Disease

To obtain a copy of these free publications or information about other National Kidney Foundation resources, contact your local National Kidney Foundation affiliate, or call the national toll-free number 800.622.9010. Also, visit the Web site of the National Kidney Foundation’s Kidney Learning System at www.kidney.org/KLS.
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.

A Curriculum for CKD Risk Reduction and Care

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