Nutrition and Hemodialysis

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 is based on the K/DOQI recommended guidelines for nutrition. All K/DOQI guidelines provide information and assists 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)

- 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	60-89
3A	Kidney Damage with mild to moderate decrease in GFR	45-59
3B	Kidney Damage with moderate to severe decrease in GFR	30-44
4	Kidney Damage with severe reduction in GFR	15-29
5	Kidney Failure	Less than 15

Nutrition and Hemodyalysis

If you are receiving hemodialysis 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
  - **Sodium and fluid**
  - **Phosphorus and calcium**
  - **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 hemodialysis treatments. The information is based on recommendations developed by the National Kidney Foundation's Kidney Disease Outcomes Quality Initiative to help your care team provide the best care for you.

If you are receiving peritoneal dialysis treatment, see the National Kidney Foundation booklet, Nutrition and Peritoneal Dialysis. 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 helps to give you energy to do the activities you enjoy. Calories come from all the foods you eat, and are important because they:

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

The registered dietitian at your dialysis center will help you plan your meals to get the right amount of calories each day. The amount of calories recommended for you will depend on your individual needs. Eating the right amount of calories each day will keep you from losing weight. If you are losing weight, your dietitian may ask you to add extra sweets like sugar, jelly, jam, hard candy, honey or syrup. Other good sources of calories are fasts like soft (tub) margarine, and oils like canola or olive oil. If you have diabetes, speak to your dietitian about how to safely add calories to your diet.

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 each day. 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 and dietitian. 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 stated 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 dialysis, your diet will include more 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.

Protein-rich foods include:

- Fresh meats
- Poultry (chicken and turkey)
- Fish and other seafood
- Eggs or egg whites
- Small servings 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 you 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:

- Seasonings like soy sauce, teriyaki sauce and garlic or onion salt
- Most canned foods and some frozen dinners
- 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 you 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
To cut down on sodium, try using fresh or dried herbs and spices instead of salt to enhance the flavor of your foods. Also, try added a dash of hot pepper sauce or a squeeze of lemon for flavor.

Your doctor or dietitian will help you determine the right amount of fluid to drink each day. A sudden increase in weight, alone with swelling, shortness of breath or a rise in your blood pressure may be signs that you are drinking too much. Tell your dialysis care team if you are having any of these problems. Check your weight at the beginning of each treatment. Ask you 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 such as cocoa, beer and dark cola drinks

Eating foods high in phosphorus will raise the amount of phosphorus in your blood. Dialysis cannot remove all of this phosphorus. When phosphorus builds up in your blood, calcium is pulled from the bones. Over time, your bones will become weak and break easily. A high level of phosphorus in your blood may also cause calcium-phosphorus crystals to build up in your joints, muscles, skin, blood vessels and heart. These deposits may cause serious problems 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 medicine called a **phosphate binder**. These binders are taken with 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 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 ways to prevent loss of calcium from your bones are to follow a diet that limits high-phosphorus foods and to take phosphate binders. Your doctor may also prescribe 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 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 the blood can be dangerous. With hemodialysis, you will probably need to limit your intake of high-potassium foods. The level of potassium in your blood will be checked every month and your dietitian will help you plan a diet that will give you the right amount of potassium. 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 such as meat, 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 good diet, your doctor may order special vitamin and mineral supplements for two reasons. Kidney disease and dialysis change the amounts of vitamins and minerals your body needs. Also, your special diet may limit some food groups that would normally provide important vitamins and minerals. Take only those supplements ordered by your kidney doctor 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 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 hemodialysis. You may need to drink less milk and eat less potassium-rich fruits and vegetables. Your dietitian will help develop a meal plan especially for you.

- Vegetarian Diets (Plant-based diets)

Most vegetarian diets are no right 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, monitor 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 easy for your doctor and dietitian to determine if you are eating the right amount of calories or protein. The following sections explain these tests and methods. If your results are not what 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 Foundations 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 each month. If your level is too low, it may mean you are not eating enough protein or calories. If your serum albumin level continues to be low, you have a greater chance of getting infections, being hospitalized or 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.

- Other Tests That Tell About Your Nutritional Health
  - Amount of Dialysis You Receive

    Every month, tests will be used to determine if you are getting the right amount of dialysis to keep you in overall good health. Blood is tested at the beginning and the end of one of your dialysis treatments, and you may also be asked for a urine sample. This information will provide a way to measure dialysis, 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. Low amounts of dialysis can keep you from feeling, sleeping or eating well. 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 remain kidney function. Creatinine can also be lowered by not eating enough calories and protein, as well as by weight loss. If your creatinine level is decreasing, ask your doctor or dietitian on whether this change is related to your diet, your dialysis or your kidney function.

Steps to Take

- Ask your doctor and dietitian which tests will be used to check your nutritional health.
- Ask for a copy of the Dialysis Report Card and track your results.
- If your numbers are not as they should be, 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 the following publications from the National Kidney Foundation.

Booklets (single copies are available)

- Nutrition and Peritoneal Dialysis
- Nutrition and Chronic Kidney Disease
- Nutrition and Transplantation
- Dining Out with Confidence: A Guide for Kidney Patients

Fact sheets available at www.kidney.org:

- 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
- Use of Herbal Supplements in Chronic Kidney Disease
- Vitamins and Minerals in Kidney Disease