Nutrition for Advanced Chronic Kidney Disease in Adults

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Why is nutrition important for someone with advanced chronic kidney disease?

A person may prevent or delay some health problems from chronic kidney disease (CKD) by eating the right foods and avoiding foods high in sodium, potassium, and phosphorus. Learning about calories, fats, proteins, and fluids is important for a person with advanced CKD. Protein foods such as meat and dairy products break down into waste products that healthy kidneys remove from the blood.

As CKD progresses, nutritional needs change. A health care provider may recommend that a patient with reduced kidney function choose foods carefully.

What do the kidneys do?

The kidneys remove wastes and extra water from the blood and make urine. To keep the body working properly, the kidneys balance the salts and minerals—such as calcium, phosphorus, sodium, and potassium—that circulate in the blood. The kidneys also release hormones that help make red blood cells, regulate blood pressure, and keep bones strong.

What are the effects of CKD?

CKD usually takes a long time to develop and does not go away. In CKD, the kidneys continue to work—just not as well as they should. Wastes may build up so gradually that the body becomes used to having those wastes in the blood. Salts containing phosphorus and potassium may rise to unsafe levels, causing heart and bone problems. Anemia—low red blood cell count—can result from CKD because the kidneys stop making enough erythropoietin, a hormone that causes bone marrow to make red blood cells. After months or years, CKD may progress to permanent kidney failure, which requires a person to have a kidney transplant or regular blood filtering treatments called dialysis.

What is medical nutrition therapy (MNT)?

MNT is the use of nutrition counseling by a registered dietitian to help promote a medical or health goal. A health care provider may refer a patient to a registered dietitian to help with the patient's food plan. Many insurance policies cover MNT when recommended by a health care provider. Anyone who qualifies for Medicare can receive a benefit for MNT from a registered dietitian or nutrition professional when a health care provider provides a referral indicating that the person has diabetes or kidney disease.

One way to locate a qualified dietitian is to contact the Academy of Nutrition and Dietetics at www.eatright.org and click on "Find a Registered Dietitian." Users can enter their address or ZIP code for a list of dietitians in their area. A person looking for dietary advice to prevent kidney damage should click on "Renal (Kidney) Nutrition" in the specialty field. Dietitians who specialize in helping people with CKD are called renal dietitians.

Why is knowing about calories important for someone with advanced CKD?

As CKD progresses, people often lose their appetites because they find that foods do not taste the same. As a result, they consume fewer calories—important units of energy in food—and may lose too much weight. Renal dietitians can help people with advanced CKD find healthy ways to add calories to their diet if they are losing too much weight.

Why is knowing about protein important for someone with advanced CKD?

Protein is an essential part of any diet. Proteins help build and maintain muscle, bone, skin, connective tissue, internal organs, and blood. They help fight disease and heal wounds. But proteins also break down into waste products that must be removed from the blood by the kidneys. Eating more protein than the body needs may put an extra burden on the kidneys and cause kidney function to decline faster.

Health care providers recommend that people with CKD eat moderate or reduced amounts of protein. However, restricting protein could lead to malnutrition, so people with CKD need to be careful. The typical American diet contains more than enough protein. Learning about portion sizes can help people limit protein intake without endangering their health.

What is the right meat portion size?

Most people—with or without CKD—can get the daily protein they need by eating two 3-ounce servings of meat or meat substitute. A 3-ounce serving of meat is about the size of a deck of cards or the palm of a person's hand.

A renal dietitian can help people learn about the amount and sources of protein in their diet. Animal protein in egg whites, cheese, chicken, fish, and red meats contain more of the essential nutrients a body needs. With careful meal planning, a well-balanced vegetarian diet can also provide these nutrients. A renal dietitian can help people with advanced CKD make small adjustments in their eating habits that can result in significant protein reduction. For example, people can lower their protein intake by making sandwiches using thinner slices of meat and adding lettuce, cucumber slices, apple slices, and other garnishes. The following table lists some higher-protein foods and suggestions for lower-protein alternatives that are better choices for people with CKD trying to limit their protein intake.

Higher- and Lower-protein Foods

Based on about a 3 oz. portion	
Higher-Protein Foods	Lower-protein Alternatives

Based on about a 3 oz. portion	
Higher-Protein Foods	**Lower-protein Alternatives**
• Ground beef • Halibut • Shrimp • Salmon • Tuna • Chicken breast • Roasted chicken	• Chili con carne • Beef stew • Egg substitutes • Tofu • Imitation crab meat

Source: United States Department of Agriculture (USDA) National Nutrient Database for Standard Reference, Release 25. USDA website. ndb.nal.usda.gov. Released 2012. Accessed November 6, 2012.

When kidney function declines to the point where dialysis becomes necessary, patients should include more protein in their diet because dialysis removes large amounts of protein from the blood.

Why is knowing about fat important for someone with advanced CKD?

Everyone should know about fat sources because eating the wrong kinds of fat and too much fat increases the risk of clogged blood vessels and heart problems. Fat provides energy, helps produce hormone-like substances that regulate blood pressure and other heart functions, and carries fat-soluble vitamins. Everyone needs dietary fat, but some fats are healthier than others. People with CKD are at higher risk of having a heart attack or stroke. Therefore, people with CKD should be especially careful about how dietary fat affects their heart health.

People with advanced CKD should talk with a dietitian about healthy and unhealthy sources of fat. Saturated fats and trans-fatty acids can raise blood cholesterol levels and clog blood vessels. Saturated fats are found in animal products such as red meat, poultry, whole milk, and butter. These fats are usually solid at room temperature. Trans-fatty acids are often found in commercially baked goods such as cookies and cakes and in fried foods like doughnuts and french fries.

A dietitian can suggest healthy ways to include fat in the diet, especially if more calories are needed. Vegetable oils such as corn or safflower oil are healthier than animal fats such as butter or lard. Hydrogenated vegetable oils should be avoided because they are high in trans-fatty acids. Monounsaturated fats—olive, peanut, and canola oils—are healthy alternatives to animal fats. The table below shows the sources of fats, broken down into three types of fats that should be eaten less often and good fats that can be eaten more often.

Sources of Fats

Eat Less Often	Eat More Often
Saturated fats • red meat • poultry • whole milk • butter • lard Trans-fatty acids • commercial baked goods • french fries • doughnuts Hydrogenated vegetable oils • margarine • shortening	Monounsaturated fats • corn oil • safflower oil • olive oil • peanut oil • canola oil

Why is knowing about sodium important for someone with advanced CKD?

Too much sodium in a person's diet can be harmful because it causes blood to hold fluid. People with CKD need to be careful not to let too much fluid build up in their bodies. The extra fluid raises blood pressure and puts a strain on the heart and kidneys. A dietitian can help people find ways to reduce the amount of sodium in their diet. Nutrition labels provide information about the sodium content in food. The U.S. Food and Drug Administration advises that healthy people should limit their daily sodium intake to no more than 2,300 milligrams (mg), the amount found in 1 teaspoon of table salt. People who are at risk for a heart attack or stroke because of a condition such as high blood pressure or kidney disease should limit their daily sodium intake to no more than 1,500 mg. Choosing sodium-free or low-sodium food products will help them reach that goal.

Sodium is found in ordinary table salt and many salty seasonings such as soy sauce and teriyaki sauce. Canned foods, some frozen foods, and most processed meats have large amounts of salt. Snack foods such as chips and crackers are also high in salt.

Alternative seasonings such as lemon juice, salt-free seasoning mixes, and hot pepper sauce can help people reduce their salt intake. People with advanced CKD should avoid salt substitutes that use potassium, such as AlsoSalt or Nu-Salt, because CKD limits the body's

ability to eliminate potassium from the blood. The table below provides some high-sodium foods and suggestions for low-sodium alternatives that are healthier for people with any level of CKD who have high blood pressure.

High- and Low-sodium Foods

High-sodium Foods	Low-sodium Alternatives
• Salt • Regular canned vegetables • Hot dogs and canned meat • Packaged rice with sauce • Packaged noodles with sauce • Frozen vegetables with sauce • Frozen prepared meals • Canned soup • Regular tomato sauce • Snack foods	• Salt-free herb seasonings • Low-sodium canned foods • Fresh, cooked meat • Plain rice without sauce • Plain noodles without sauce • Fresh vegetables without sauce • Frozen vegetables without sauce • Homemade soup with fresh ingredients • Reduced-sodium tomato sauce • Unsalted pretzels • Unsalted popcorn

Source: United States Food and Drug Administration (FDA) Food Labeling Guide. IX. Appendix A: Definitions of Nutrient Content Claims. FDA website. http://www.fda.gov. Revised April 2008. Accessed June 21, 2010.

Why is knowing about potassium important for someone with advanced CKD?

Keeping the proper level of potassium in the blood is essential. Potassium keeps the heart beating regularly and muscles working right. Problems can occur when blood potassium levels are either too low or too high. Damaged kidneys allow potassium to build up in the blood, causing serious heart problems. Potassium is found in many fruits and vegetables, such as bananas, potatoes, avocados, and melons. People with advanced CKD may need to avoid some fruits and vegetables. Blood tests can indicate when potassium levels have climbed above normal range. A renal dietitian can help people with advanced CKD find ways to limit the amount of potassium they eat. The potassium content of potatoes and other vegetables can be reduced by boiling them in water. The following table gives examples of some high-potassium foods and suggestions for low-potassium alternatives for people with advanced CKD.

High- and Low-potassium Foods

High-potassium Foods	Low-potassium Alternatives

High-potassium Foods	Low-potassium Alternatives
• Oranges and orange juice • Melons • Apricots • Bananas • Potatoes • Tomatoes • Sweet potatoes • Cooked spinach • Cooked broccoli • Beans (baked, kidney, lima, pinto)	• Apples and apple juice • Cranberries and cranberry juice • Canned pears • Strawberries, blueberries, raspberries • Plums • Pineapple • Cabbage • Boiled Cauliflower

Why is knowing about phosphorus important for someone with advanced CKD?

Damaged kidneys allow phosphorus, a mineral found in many foods, to build up in the blood. Too much phosphorus in the blood pulls calcium from the bones, making the bones weak and likely to break. Too much phosphorus may also make skin itch. Foods such as milk and cheese, dried beans, colas, canned iced teas and lemonade, nuts, and peanut butter are high in phosphorus. A renal dietitian can help people with advanced CKD learn how to limit phosphorus in their diet.

As CKD progresses, a person may need to take a phosphate binder such as sevelamer hydrochloride (Renagel), lanthanum carbonate (Fosrenol), calcium acetate (PhosLo), or calcium carbonate (Tums) to control the phosphorus in the blood. These medications act like sponges to soak up, or bind, phosphorus while it is in the stomach. Because it is bound, the phosphorus does not get into the blood. Instead, it is removed from the body in the stool.

The table below lists some high-phosphorus foods and suggestions for low-phosphorus alternatives that are healthier for people with advanced CKD.

High- and Low-phosphorus Foods

High-phosphorus Foods	Low-phosphorus Alternatives

High-phosphorus Foods	Low-phosphorus Alternatives
• Dairy foods (milk, cheese, yogurt) • Beans (baked, kidney, lima, pinto) • Nuts and peanut butter • Processed meats (hot dogs, canned meat) • Cola • Canned iced teas and lemonade • Bran cereals • Egg yolks	• Liquid non-dairy creamer • Sherbet • Cooked rice • Rice, wheat, and corn cereals • Popcorn • Lemon-lime soda • Root beer • Powdered iced tea and lemonade mixes

Why is regulating fluid intake important for someone with advanced CKD?

People with advanced CKD may need to limit how much they drink because damaged kidneys can't remove extra fluid. The fluid builds up in the body and strains the heart. Patients should tell their health care provider about any swelling around the eyes or in the legs, arms, or abdomen.

How can understanding and keeping track of lab reports help someone with advanced CKD make healthy food choices?

Learning how to read and understand lab reports lets a person see how different foods can affect the kidneys. A health care provider should order regular blood tests for people with CKD. Patients can ask their health care provider for copies of their lab reports and ask to have them explained, noting any results out of the normal range. Keeping track of these lab results (PDF, 262 KB) can help people see whether they are making progress or getting worse. People with CKD should talk with their health care provider or dietitian about how they can make healthier food choices. For example, if a test shows that a person with advanced CKD has a high potassium level, that person should concentrate on reducing potassium in the diet by limiting high-potassium foods.

Clinical Trials

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) and other components of the National Institutes of Health (NIH) conduct and support research into many diseases and conditions.

What are clinical trials, and are they right for you?

Clinical trials are part of clinical research and at the heart of all medical advances. Clinical trials look at new ways to prevent, detect, or treat disease. Researchers also use clinical trials to look at other aspects of care, such as improving the quality of life for people with chronic illnesses. Find out if clinical trials are right for you NIH.

What clinical trials are open?

Clinical trials that are currently open and are recruiting can be viewed at www.ClinicalTrials.gov NIH.

March 2014

This content is provided as a service of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), part of the National Institutes of Health. The NIDDK translates and disseminates research findings to increase knowledge and understanding about health and disease among patients, health professionals, and the public. Content produced by the NIDDK is carefully reviewed by NIDDK scientists and other experts.

The NIDDK would like to thank:
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