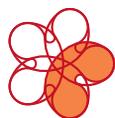


# Keeping Your Heart Healthy What You Should Know About Lipids

When You Have Chronic Kidney Disease  
Stages 1–4



National Kidney  
Foundation®

[www.kidney.org](http://www.kidney.org)

**LOVE YOUR  
KIDNEYS™**

## National Kidney Foundation's Kidney Disease Outcomes Quality Initiative

Did you know that the National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (NKF-KDOQI™) develops guidelines that help your doctor and healthcare team make important decisions about your medical treatment? The information in this booklet is based on the NKF-KDOQI recommended guidelines.

### 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.

#### 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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## **Keeping Your Heart Healthy: What You Should Know When You Have Chronic Kidney Disease (Stages 1–4)**

Heart disease is very common in people with chronic kidney disease. This means you may be more likely to have a heart attack, stroke or angina (chest pain). It is important to follow your doctor's advice about how to lower your risk for heart disease. One of the things that may make you more likely to develop heart problems is having unhealthy levels of lipids (fatty substances like cholesterol) in your blood. This booklet explains how these blood lipids may affect your health and what treatments you may need to get your blood lipids back to a heart-healthy level.

This booklet is written for adults who have chronic kidney disease in stages 1 to 4. If you are not sure about your stage of kidney disease, speak to your doctor and see the chart on the inside front cover of this booklet. If you do not have chronic kidney disease stages 1–4, you can find information about other NKF booklets in "Other Resources" on page 21.

## **About Blood Lipids**

### **What are blood lipids?**

Blood lipids are fatty substances (like cholesterol) found in your blood and body tissues. Your body needs lipids like cholesterol to work normally. Cholesterol is present in nerve tissue, muscles, skin, the liver, the intestines and the heart. Your body uses cholesterol to make hormones, vitamin D and bile acid to help digest fat. However, it only takes a small amount of cholesterol in your blood to meet these needs. Too much cholesterol in your blood can cause plaque (a fatty deposit in the walls of blood vessels) to form in your arteries, including the arteries of your heart.

## Are there different types of blood lipids?

Yes. There are three main types of blood lipids:

- **Low-density lipoprotein (LDL) cholesterol**—  
A "bad" type of cholesterol that causes damaging plaque to build up and block your arteries. If your LDL cholesterol is too high, lowering this lipid may help to prevent heart disease.
- **High-density lipoprotein (HDL) cholesterol**—  
A "good" type of cholesterol that helps to keep cholesterol from building up in your arteries. Having more HDL cholesterol is known to be heart-healthy.
- **Triglycerides**—The most common form of stored fat in your body. Normally, only a small portion is found in your blood. Triglycerides may not cause fat deposits in your arteries, but they often go along with low HDL or a tendency toward diabetes. Both of these conditions raise your risk for heart disease.

## Why should I be concerned about my blood lipid levels?

Having too much LDL cholesterol or too little HDL cholesterol can cause plaque to build up and block your arteries. This can slow down or block the flow of blood to your heart and other organs. Your blood carries oxygen to your heart. If your heart does not get enough blood and oxygen, you may experience

chest pain. If the blood supply to a portion of the heart is reduced or completely cut off by a blockage, the result is a heart attack. If the blood supply to a portion of your brain is reduced or completely cut off by a blockage, a stroke may result.

### What causes my blood lipid levels to be unhealthy?

Some things that may cause unhealthy blood lipid levels include:

- Too much saturated fat and cholesterol in your diet. (See "What type of diet should I follow?" on page 11.)
- Being overweight or obese
- Lack of regular exercise
- Drinking alcohol (beer, wine and liquor)
- Having a family history of unhealthy blood lipid levels
- Having certain conditions like diabetes or an underactive thyroid gland
- Certain medications.

Your age and gender may also be factors. Before menopause, women usually have healthier cholesterol levels than men of the same age. After menopause, women have cholesterol levels more like those found in men of the same age.

## How are my blood lipids measured?

You should have a blood test called a complete lipid profile. Since this test is affected by food, you may be asked to not eat for 9 to 12 hours before the test.

A complete lipid profile includes:

- Total cholesterol
- HDL (good) cholesterol
- LDL (bad) cholesterol
- Triglycerides.

Another measure that tells your doctor about your risk for heart disease is called non-HDL cholesterol.

This includes LDL cholesterol plus other parts of total cholesterol that are not heart-healthy.

Non-HDL cholesterol is found by subtracting your level of HDL cholesterol from your total cholesterol.

A high non-HDL cholesterol may mean you have an increased risk for heart disease.

## How often should my blood lipids be checked?

- At least once a year
- Two or three months after any changes in your treatment.



### What are healthy blood lipid levels?

Adults with chronic kidney disease can reduce their risk of heart disease if their:

- Non-HDL cholesterol is less than 130
- HDL cholesterol is 40 or higher
- LDL cholesterol is less than 100; less than 70 if you also have diabetes
- Triglycerides are less than 150.

## Treating Unhealthy Blood Lipid Levels

### What type of treatment will I need if my blood lipids are not at a healthy level?

If your blood lipids are not at a healthy level, your doctor may:

- Recommend that you make some changes to a healthier lifestyle
- Prescribe medication to help lower your blood lipid levels.

### What kinds of lifestyle changes will I need to make?

You may need to:

- Follow a diet low in saturated fats and cholesterol. (See the Diet Suggestions table on page 24. Speak to a registered dietitian if you need help.)
- Follow a program of regular physical activity approved by your doctor
- Stop smoking if you are a smoker
- Lose excess weight
- Limit alcohol to one drink a day.

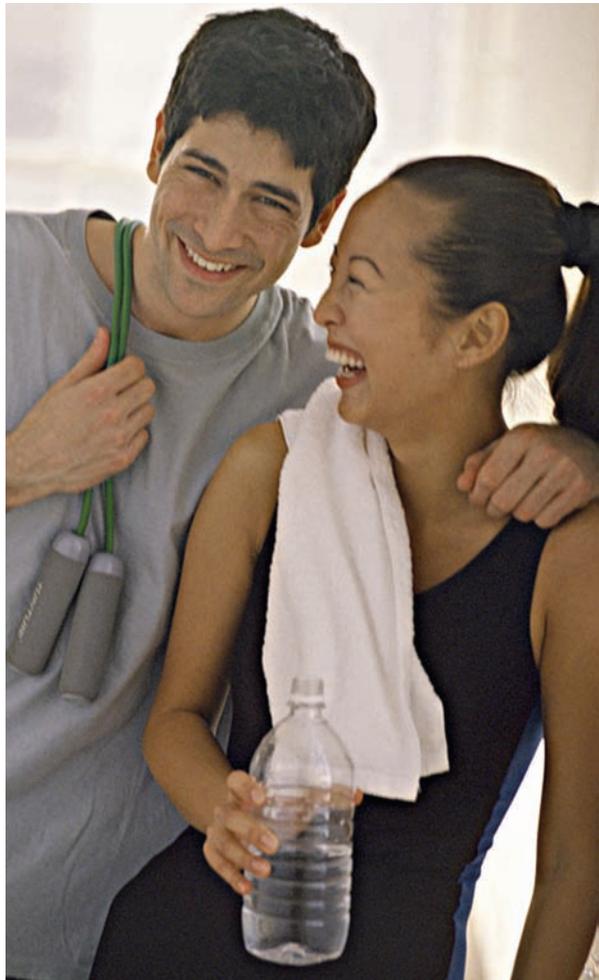
## Diet and Exercise

### What type of diet should I follow?

To improve your blood lipid levels, your diet should be low in saturated fats and cholesterol. Your daily diet should have:

- Low levels of saturated fat
- Less than 200 milligrams of cholesterol.

Your doctor can explain this diet in more detail. A registered dietitian can work with you to create a diet plan that meets your needs. The dietitian can also teach you how to read nutrition facts labels on all foods. These labels tell you how much saturated fat and cholesterol are in the foods you are eating.





## What foods are high in saturated fats and cholesterol?

Large amounts of saturated fats are found in:

- Foods from animal sources such as fatty meats, luncheon meat, sausage, hot dogs, bacon, ribs and skin or fat on meat or poultry
- Dairy products such as cream, whole milk, cheeses, cream cheese, sour cream and ice cream
- Certain oils like palm kernel oil
- Certain solid fats such as butter, lard or hard shortenings sold in cans
- Certain nuts like Brazil nuts and macadamia nuts
- Chocolate and coconut
- Anything made from these foods, especially desserts, pastries, cakes, cookies, candy bars, creamed soups, sauces, gravies, cheese sauces and pizza
- Reduced or low-fat options may be available for some of these foods. Check with a dietitian if you are not sure about the amount of fat in the foods you enjoy.

Cholesterol is found in any products that come from animals. Cholesterol-rich foods include:

- Egg yolks (egg whites have no fat or cholesterol)
- Any dairy products containing fat
- Fat from meats and poultry
- Organ meats (liver, kidneys, sweetbreads and brain).

### What about fiber?

Eating high-fiber foods such as fresh fruits and vegetables and whole grains in breads and cereals may help improve your lipid levels. If you have chronic kidney disease and you are following a lower-protein diet, your doctor may recommend limiting some high-fiber foods.

### Is there anything else I need to watch in my diet?

Yes. Your diet will vary depending on your stage of chronic kidney disease. If your kidney disease gets worse, you may need to limit some things in your diet such as protein, dairy products and certain fruits and vegetables. Your doctor will tell you if you need to make these changes. A registered dietitian can help you plan your meals to get the right foods in the right amounts. (See the National Kidney Foundation's resources on nutrition at [www.kidney.org/store](http://www.kidney.org/store) or call 800.622.9010 for more information.)

## How does exercise help?

Regular physical activity can help reduce your risk for heart disease by:

- Lowering your LDL (bad) cholesterol
- Raising your HDL (good) cholesterol
- Lowering your triglyceride level
- Reducing excess weight
- Improving the fitness of your heart and lungs
- Helping to control your blood glucose if you have diabetes
- Helping to control high blood pressure.



## How much exercise do I need?

Speak to your doctor before starting an exercise program. If you have not exercised regularly, start slowly with activities like:

- Walking
- Using the stairs instead of the elevator
- Gardening
- Housework
- Dancing
- Exercising at home.

Begin with a few minutes three or four days a week. Increase gradually to at least 20 to 30 minutes a day. Always include a five-minute warm-up and cool-down. If you feel comfortable with this level of activity, you can also begin to include regular aerobic activities such as:

- Brisk walking
- Jogging
- Swimming
- Biking
- Playing tennis.

If you have chest pain or feel faint or light-headed or become extremely out of breath while exercising, stop at once and tell your doctor as soon as possible.

## Lipid-Lowering Medications

### Will I need to take medications to improve my blood lipid levels?

You may. Lifestyle changes alone may not always be enough to control your blood lipid levels. Some of the medications used to lower your lipid levels may interact with your other medications. It is important to tell your doctor about all medications you take, including over-the-counter drugs, vitamins and herbal supplements. Your doctor will consider the following:

- Your complete lipid profile
- All medications and supplements you are taking
- Other health problems you may have.

If your doctor orders a medication to help lower lipids, you should continue following your diet and exercise program. Combining all these steps may reduce the amount of medication you need or make the medication work better.

### Do these medications have side effects?

Like most medications, the lipid-lowering drugs may have some side effects. These depend on which medications your doctor prescribes for you. The most common side effects include:

- Upset stomach
- Constipation
- Rash or flushing of the skin
- Cramps

- Muscle soreness, pain or weakness
- Diarrhea
- Rarely, liver problems.

Your doctor will check on how you are doing with your medications. You should report any side effects to your doctor as soon as possible.



## Treatment Goals

### What are the goals of treating unhealthy blood lipid levels?

The goal of your treatment is to get your blood lipids to heart-healthy levels:

- If your LDL (bad) cholesterol is 100 or higher, the goal is to reduce LDL to below 100.
- In general, triglyceride levels should be below 150. If your triglyceride level is very high (500 or above), this could cause an inflammation of your pancreas, the gland that helps to regulate your blood sugar level. Because this is a serious medical problem, it is important to prevent it by reducing triglycerides to below 500.
- If your non-HDL cholesterol is 130 or higher, the goal is to reduce it to below that level.



## Other Risk Factors for Heart Disease

### What other things may increase the chance of developing heart disease?

In addition to unhealthy lipid levels, other factors that may increase the risk for heart disease include:

- Being over age 45 in men and over 55 in women
- High blood pressure
- Diabetes
- Smoking
- A family history of heart disease
- A family history of chronic kidney disease
- Being overweight or obese
- Lack of regular exercise.

The more risk factors you have, the greater your chance of developing heart disease. Fortunately, there are steps to help reduce your risk for heart disease:

- Stop smoking if you are a smoker
- Improve unhealthy blood lipid levels
- Control high blood pressure and diabetes
- Treat chronic kidney disease
- Lose excess weight
- Increase physical activity.

### **Key Points to Remember**

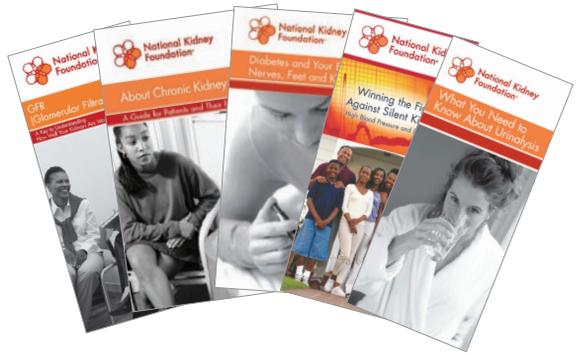
- ❑ People with chronic kidney disease have an increased risk of developing heart disease.
- ❑ Since unhealthy levels of blood lipids like cholesterol may contribute to heart problems, you should have your blood lipid levels measured periodically.
- ❑ A complete lipid profile should be done. This includes measuring total cholesterol, LDL cholesterol, HDL cholesterol and triglycerides.
- ❑ If blood lipids are not at a heart-healthy level, treatment will include lifestyle changes, which may be combined with medications.
- ❑ Lifestyle changes that help to improve blood lipid levels include:
  - Following a diet low in saturated fats and cholesterol

- Increasing physical activity
- Losing excess weight
- Stopping smoking
- Limiting alcohol to one drink a day.
- Other factors that may increase your risk for heart disease include:
  - Being over 45 in men and over 55 in women
  - High blood pressure
  - Diabetes
  - Smoking
  - A family history of heart problems
  - A family history of chronic kidney disease.



## Other Resources

If you have questions, speak with your healthcare team. They know you and can answer questions about you.



If you want to read more about kidney disease, the National Kidney Foundation has more than 50 other publications that cover many subjects, such as:

- CKD risk factors like hypertension and diabetes
- Complications of chronic kidney disease, such as cardiovascular disease, anemia or bone problems
- Nutrition for CKD patients, with information about carbohydrates, protein, sodium, phosphorus and potassium
- Treating kidney disease early
- Treating kidney failure with transplantation or dialysis.

There are two ways to learn about the many free resources available to you:

- Call the National Kidney Foundation at 800.622.9010.
- Visit the National Kidney Foundation website ([www.kidney.org/store](http://www.kidney.org/store)). (All publications are free, but there is a limit of five per person.)

Becoming an educated patient is very important to being healthy!

## NKF Patient and Family Council

You may also be interested in becoming a member of the National Kidney Foundation's Patient and Family Council, the largest patient organization dedicated to issues affecting patients with chronic kidney disease and their families. Membership in the council is free. For more information and to receive a membership application, call the National Kidney Foundation at 800.622.9010.



## Test Your Knowledge: Take this True or False Quiz.

1. Heart disease is rare in people with chronic kidney disease.  
True \_\_\_\_ False \_\_\_\_
2. Lipids are fatty substances found in your blood.  
True \_\_\_\_ False \_\_\_\_
3. Cholesterol is a common lipid.  
True \_\_\_\_ False \_\_\_\_
4. Cholesterol is needed for some important functions in your body.  
True \_\_\_\_ False \_\_\_\_
5. It is best to check blood lipids after eating.  
True \_\_\_\_ False \_\_\_\_
6. Your doctor is only concerned about your total cholesterol level.  
True \_\_\_\_ False \_\_\_\_
7. Exercise can help improve unhealthy blood lipid levels.  
True \_\_\_\_ False \_\_\_\_
8. HDL is a type of cholesterol that is known to be bad for your heart.  
True \_\_\_\_ False \_\_\_\_
9. If your cholesterol level is high, you should eat a high-fat diet.  
True \_\_\_\_ False \_\_\_\_
10. Your doctor may prescribe medications to improve your blood lipid levels.  
True \_\_\_\_ False \_\_\_\_

See answers on page 26.

## Diet Suggestions

Food	Choose	Decrease
Eggs	Limit to 2 egg yolks a week, or use 2 egg whites in place of one egg, or use cholesterol-free egg substitutes regularly	Egg yolks and whole eggs (often hidden ingredients in cookies, cakes, desserts)
Meat, poultry	Lean cuts of meat with fat trimmed off; chicken and turkey without skin  Low-fat tofu, tempeh soy-protein products	High-fat meats (sausage, bacon, organ meats such as liver, kidneys, sweetbreads, brain)  Sandwich-style meats such as ham, cold cuts, processed meats  Meats that have fat you can see. Cut off before eating or drain off while cooking. Chili, home-made soups or stews (cook, chill, remove fat and reheat)
Fish and shellfish	Fish or shellfish, baked or broiled without additional fat	Do not fry
Dairy products	Skim milk, 1% fat milk, low-fat buttermilk, evaporated skim milk, fat-free yogurt, low-fat cottage cheese, cheeses with no more than 3 grams of fat per ounce	Whole milk, cream, half-and-half, imitation milk products, whipped cream, whole-milk or custard-style yogurt, whole-milk ricotta, hard cheeses (like Swiss, American, cheddar, muenster), cream cheese, sour cream

## Diet Suggestions (continued)

Food	Choose	Decrease
Fats and oils	<p>Mono- and polyunsaturated oils—safflower, sunflower, corn, soybean, cottonseed, canola, olive, peanut</p> <p>Margarine made from any of the oils above, especially soft and liquid forms; cholesterol-lowering margarines made from plant sterols and plant stanols</p> <p>Salad dressings made from any of the oils listed above</p>	<p>Hydrogenated and partially hydrogenated fats</p> <p>Coconut, palm kernel, palm oil; coconut and coconut milk products</p> <p>Butter, lard, hard shortening, bacon fat, stick margarine</p> <p>Dressing made with egg yolk, cheese, sour cream or milk</p> <p>Certain nuts like Brazil nuts and macadamia nuts</p>
Bread and grains	<p>Breads without toppings or cheese ingredients</p> <p>Pasta, rice</p> <p>Cereals—oat, wheat, corn, rice, multigrain</p> <p>Crackers—low-fat animal crackers, unsalted soda crackers and bread sticks, melba toast</p> <p>Homemade breads made with recommended fats and oils</p>	<p>Breads of high-fat content such as croissants, flaky dinner rolls</p> <p>Granolas with coconut or hydrogenated fats</p> <p>High-fat crackers (more than 3 grams of fat per serving on label)</p> <p>Commercially baked pastries and biscuits</p>
Fruits and vegetables	<p>Fresh and frozen fruits and vegetables; dried fruits, low-sodium, canned fruits and vegetables</p>	<p>Canned fruits in heavy syrup; coconut; vegetables prepared in butter or cream sauce avocado and fried vegetables</p>

## Diet Suggestions (continued)

Food	Choose	Decrease
Snacks and sweets (may be restricted with diabetes)	Frozen desserts—low-fat and non-fat sherbert, sorbet, fruit ice	Ice cream and regular desserts
	Cookies and pies made with egg whites or egg substitutes or recommended fats; angel food cake; low-fat puddings; homemade puddings made with skim or low-fat milk	Commercially baked cookies, cakes, cream and regular pies, frosted and pound cakes; commercially fried pastries such as doughnuts; commercially made puddings, whipped cream
	Jelly beans and hard candy; plain popcorn	Chocolate, potato chips, nachos, buttered popcorn
	Fruit juices, tea, coffee, diet soda	Milk shakes, floats, eggnog

### Answers to Quiz on Page 23

- |      |       |
|------|-------|
| 1. F | 6. F  |
| 2. T | 7. T  |
| 3. T | 8. F  |
| 4. T | 9. F  |
| 5. F | 10. T |



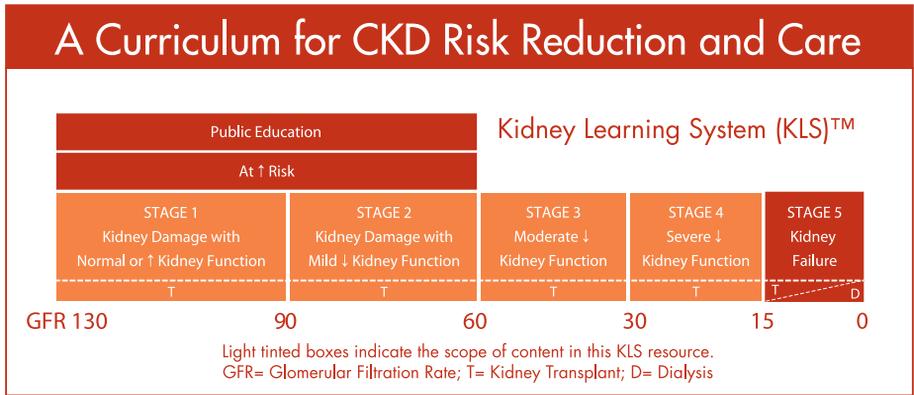
## National Kidney Foundation

The National Kidney Foundation (NKF) is dedicated to preventing kidney diseases, improving the health and well-being of individuals and families affected by these diseases and increasing the availability of all organs for transplantation.

With offices nationwide, the NKF provides early detection screenings and other vital patient and community services. The Foundation conducts extensive public and professional education, advocates for patients through legislative action, promotes organ donation and supports kidney research to identify new treatments.

In 2009 NKF launched a groundbreaking multifaceted collaborative initiative to "END THE WAIT!" for a kidney transplant in the United States in 10 years by using proven strategies to eliminate barriers to donation and institute best practices across the country.

The NKF relies on individual and corporate donations, foundation and government grants, membership and special events to support its range of programs, services and initiatives.



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