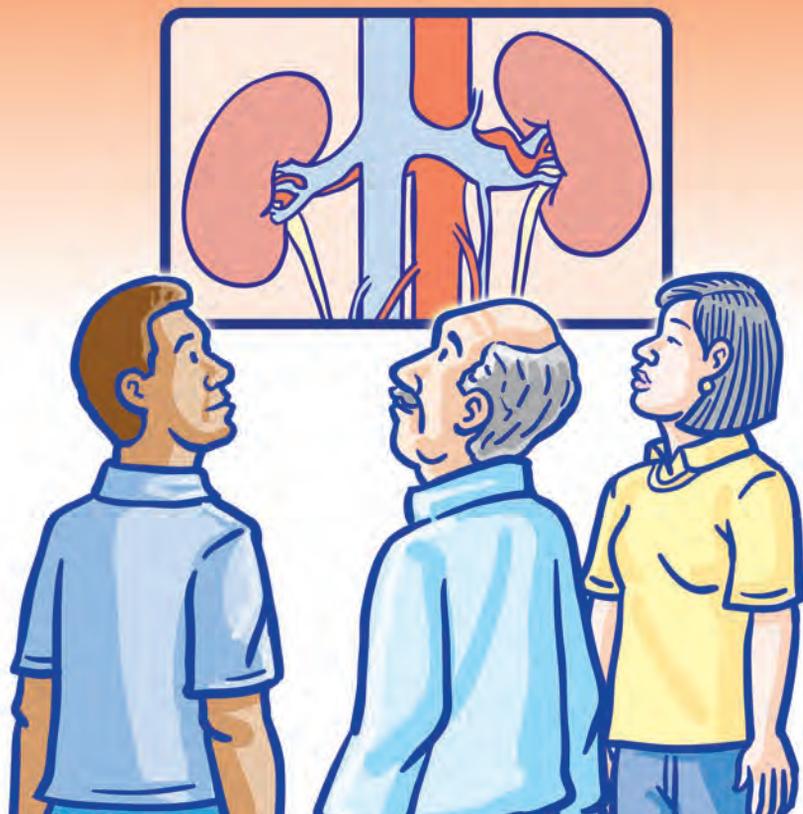


Learn About Kidneys and Kidney Disease



National
Kidney
Foundation™

www.kidney.org

Know Your Kidneys

Where are they?

Your two kidneys are under the lower ribs in the back of the body above the waist. They are about the size of your fist.

What do they do? Kidneys do a lot of important jobs.

Filter blood

Kidneys keep what your body needs. They also get rid of what your body does not need.

Keep the right amount of fluids in your body

Too little fluid (dehydration) or too much can cause problems.

Make hormones

Kidneys make three important hormones. Hormones are chemical messengers. They signal the need to make red blood cells, they control blood pressure, and they help the body use vitamin D.

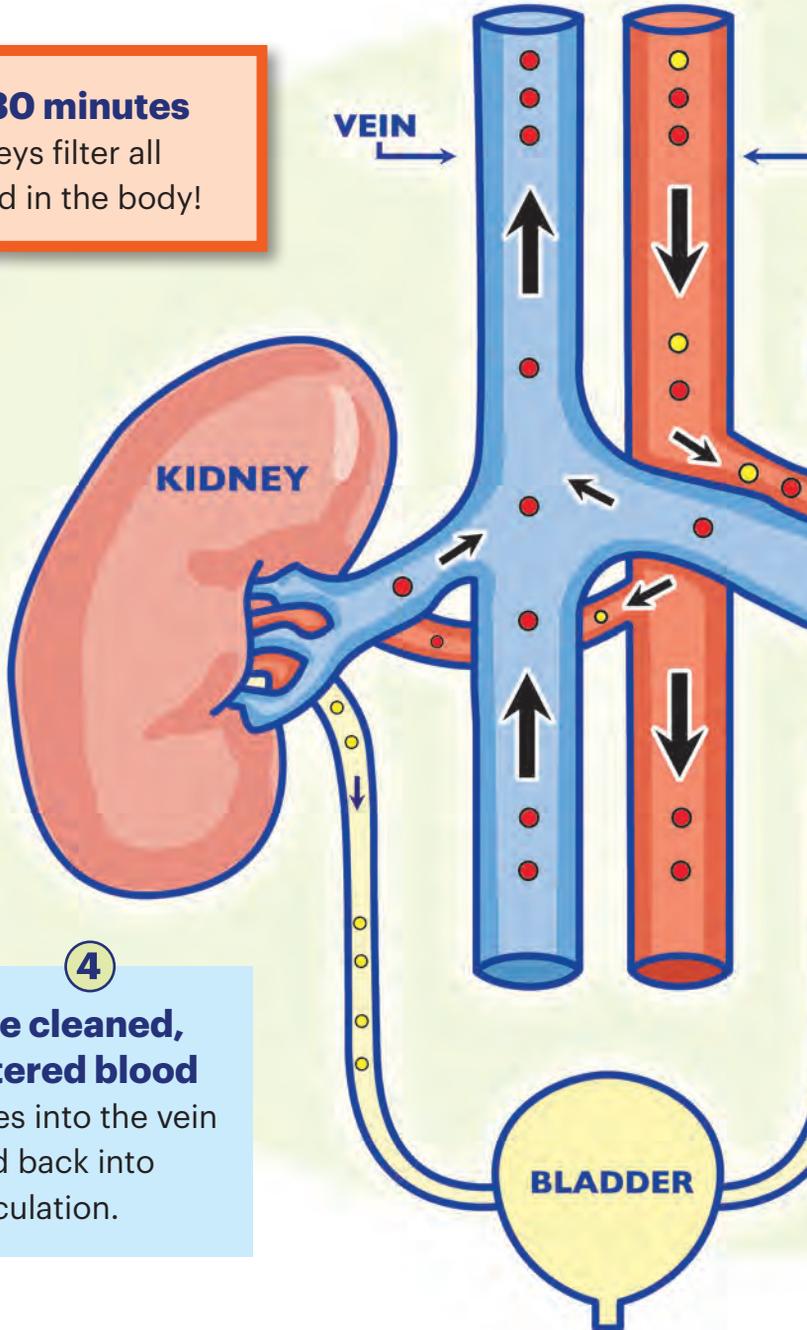
How important are the kidneys?

You need at least one working kidney to live.



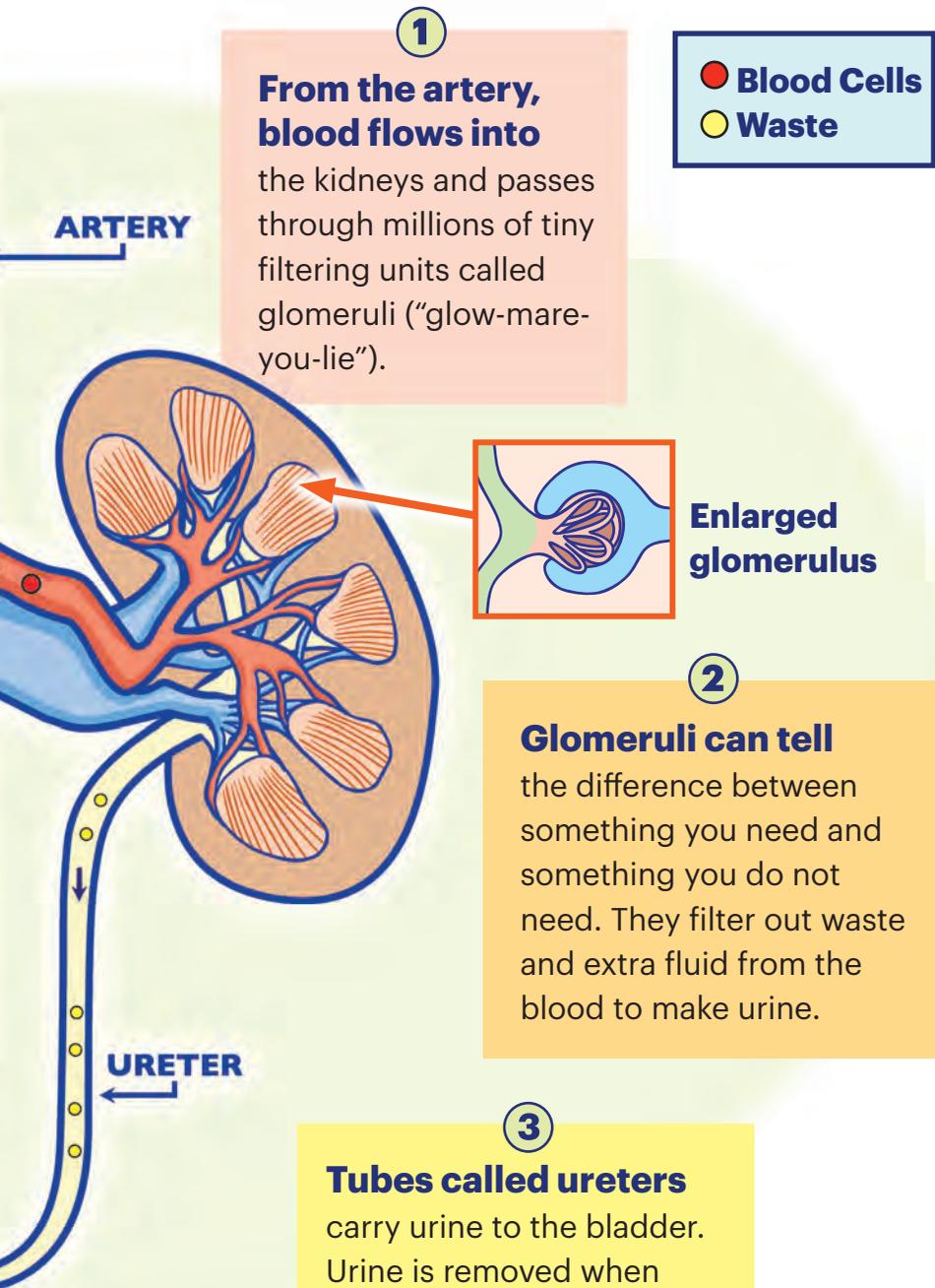
Healthy Kidneys

Every 30 minutes
the kidneys filter all
the blood in the body!



4

**The cleaned,
filtered blood**
goes into the vein
and back into
circulation.



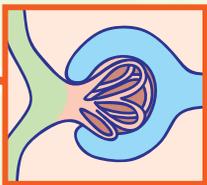
1

From the artery, blood flows into

the kidneys and passes through millions of tiny filtering units called glomeruli (“glow-mare-you-lie”).

● **Blood Cells**
● **Waste**

ARTERY



Enlarged glomerulus

2

Glomeruli can tell

the difference between something you need and something you do not need. They filter out waste and extra fluid from the blood to make urine.

URETER

3

Tubes called ureters

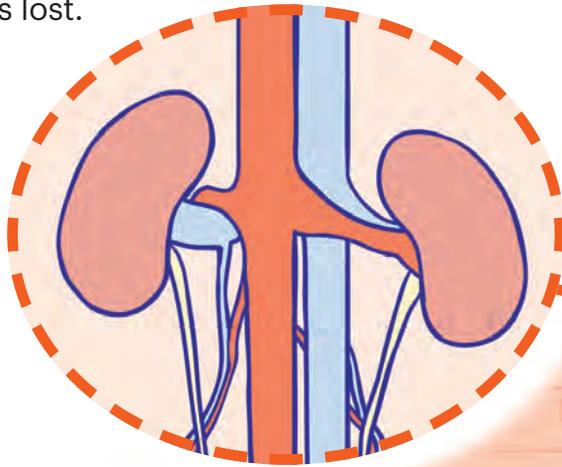
carry urine to the bladder. Urine is removed when you urinate (“pass water,” “go to the bathroom”).

Kidney Problems

Kidneys can get damaged. When kidneys are damaged, they cannot do all the things they should. This is called **chronic kidney disease or CKD**. Chronic kidney disease can affect **anyone**—young or old! 1 in 7 American adults has kidney disease — and most don't know it.

Chronic kidney disease doesn't happen overnight! It happens slowly, and in stages.

People with early kidney disease may not know anything is wrong. They cannot feel the damage before some kidney function is lost.



Risk factors include:

- Diabetes
- High blood pressure
- A family history of kidney failure
- Being age 60 or older
- African American, Hispanic, Asian, Pacific Islander, or American Indian
- Obesity



There are 5 stages of chronic kidney disease.

In each stage, the kidneys don't work as well as the stage before. The stages are determined by the level of kidney function. Kidney function is measured by a test called **glomerular filtration rate**, or **GFR**. This number tells how well the glomeruli are filtering waste and extra fluid.

A person can lose a lot of kidney function before feeling symptoms of kidney disease. When kidneys fail, a person needs a kidney transplant or dialysis to stay alive. A kidney transplant replaces a failed kidney with a healthy kidney from someone else. Dialysis uses a machine or other equipment to filter the blood.

THE GOOD NEWS:

If chronic kidney disease is found in the early stages, it can be treated. Stage 1 is the earliest. Early treatment may keep it from getting worse.



5 STAGES OF CKD

GFR
90 or
higher

STAGE 1

Kidney damage
with normal
kidney function

GFR
60–89

STAGE 2

Kidney damage
with mild loss of
kidney function

GFR
30–59

STAGE 3

Moderate loss
of kidney function

GFR
15–29

STAGE 4

Severe loss of
kidney function

GFR
less than
15

STAGE 5

Kidney failure

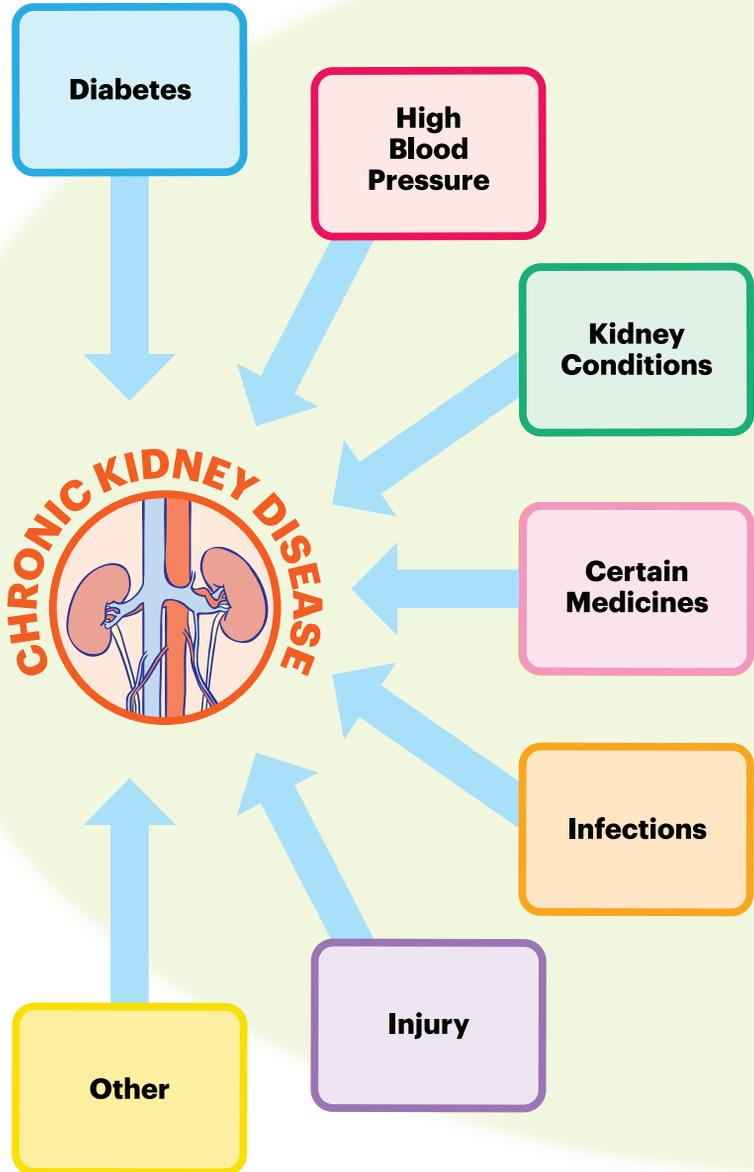
As kidney disease gets worse,
the GFR number goes down.

**People with kidney damage for 3 months
or more usually have chronic kidney disease.**

AND

**People with a GFR less than 60 for 3 months
or more usually have chronic kidney disease.**

What Can Damage the Kidneys?

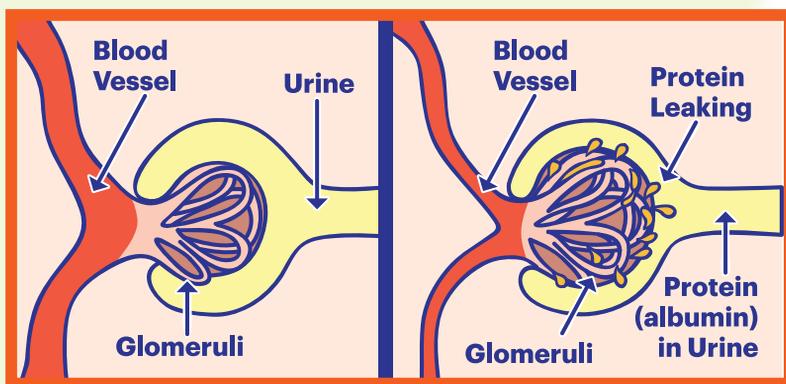


Diabetes

- Diabetes is the most common cause of kidney disease.
- Diabetes is a chronic disease where the body cannot control sugar. A high sugar level in the blood damages the small filters (**glomeruli**) in the kidneys.
- In people with diabetes, kidneys do not filter as well. They are more likely to filter out tiny amounts of **albumin** into the urine instead of keeping it in the blood. Albumin is a type of protein needed by the body. Having protein in the urine is a sign of kidney damage.
- When diabetes is controlled, there is less chance of damage to the kidneys.

Normal Glomeruli

Damaged Glomeruli



(continued)

What Can Damage the Kidneys?

(continued)

High Blood Pressure

- High blood pressure is the second most common cause of chronic kidney disease.
- High blood pressure makes the kidneys work harder. This can damage the filters. Even a little rise in blood pressure is dangerous.
- People with high blood pressure can also have protein in the urine. Protein in the urine can mean the kidneys are damaged.



Kidney Conditions

- **Glomerulonephritis** (“glom-air-you-low-ne-fry-tis”) is the third most common cause of kidney disease. It is usually caused by an infection that affects the glomeruli. Glomeruli are very small, filtering parts of the kidneys.
- **Polycystic** (“pol-ee-sis-tic”) **kidney disease** is an inherited kidney problem. With this disease, there are many cysts in the kidneys. These cysts take over the normal tissue. The kidneys can’t do their jobs as well.
- **Obstructions**, such as kidney stones. If these are not quickly fixed, they can cause kidney damage.

What Can Damage the Kidneys?

(continued)

Certain Medicines

- Some medicines used too often for pain or fever can cause kidney damage. These medicines are called NSAIDs (non-steroidal anti-inflammatory drugs), such as ibuprofen or naproxen.
- Certain contrast drugs (dyes) used in x-rays and scans
- Some bowel cleaning products
- Other medicines and supplements

Ask your healthcare provider or pharmacist...



Severe or Chronic Infections

- HIV
- Hepatitis C virus
- Other severe viral and bacterial infections

Injury

- Accident
- Trauma

Other

- Diseases of the ureters or bladder
- Diseases such as lupus
- Birth defects
- Environmental exposures to:
lead, mercury, or toxic chemicals
- Smoking
- Tumors
- Obesity

Tests for Chronic Kidney Disease

Early kidney disease has no symptoms.

You may not know anything is wrong. In fact, you can lose most of your kidney function before symptoms appear. This is why it is so important to find it early. The right treatment may slow it down.

People at risk should have 2 simple tests.



1 **A blood test for creatinine** (“kree-a-tin-in”). **The result of this test is used to estimate GFR.** GFR is the best way to test how well the kidneys are working, so know your GFR number!

(See chart on page 9.)

2

A **urine test** to find out if protein is in the urine, and, if so how much there is. Protein in the urine is a sign of kidney damage.



How Is Kidney Disease Treated?

Chronic kidney disease can't be cured, but it can be treated.

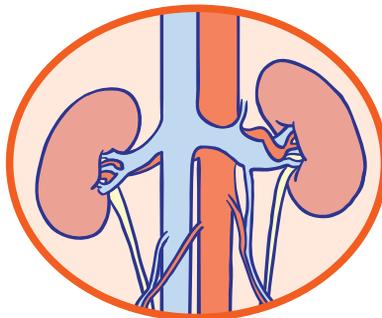
- Chronic kidney disease needs to be treated.
- The earlier kidney disease is found, the earlier it can be treated.
- The treatment plan depends on the stage of kidney disease and other health problems.
- The goals of treatment are to slow kidney disease and keep it from getting worse.



Did you know that more people with kidney disease die of heart disease before their kidneys fail? This is because kidney disease causes heart and blood vessel problems. People with or without kidney disease can help lower their risk of heart and blood vessel problems.

Make heart-healthy and kidney-healthy choices:

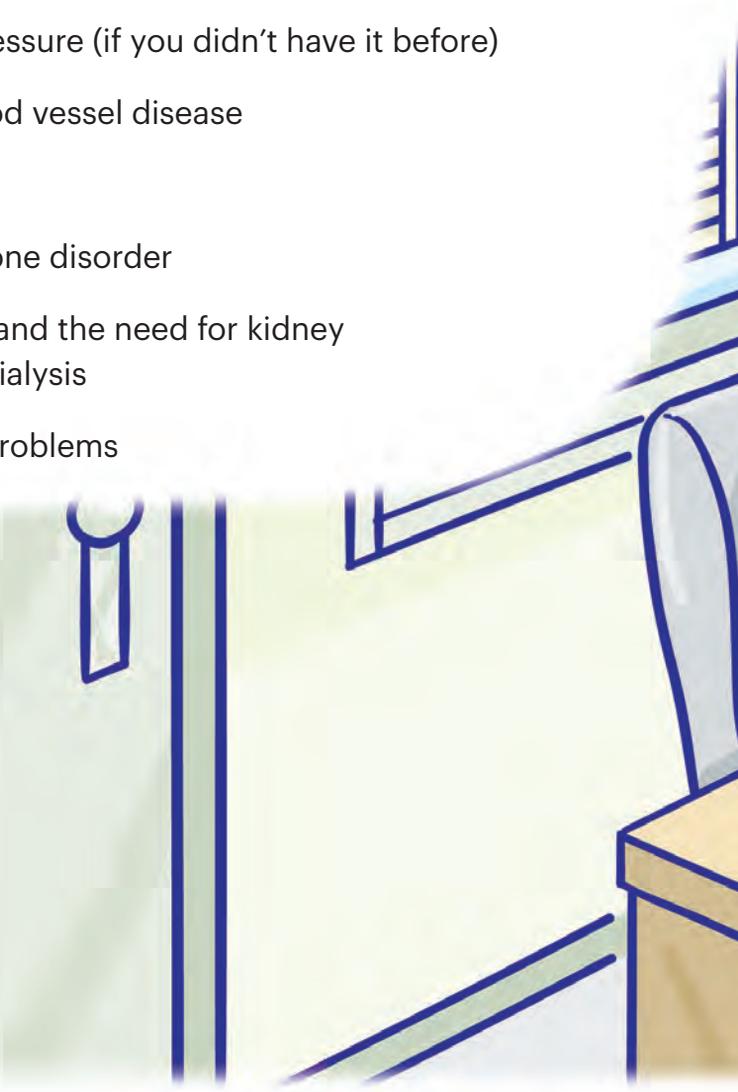
- Don't smoke.
- Know your goals for important tests, like blood pressure and blood glucose (sugar).
- Control high blood pressure.
- Control diabetes.
- Control cholesterol.
- Eat healthy meals.
- Exercise regularly.
- Lose weight if you are overweight.
- Follow your doctor's instructions and take medicines as prescribed.



What Could Happen if Kidney Disease is Not Treated?

If kidney disease is not treated, you have a higher risk of:

- High blood pressure (if you didn't have it before)
- Heart and blood vessel disease
- Anemia
- Mineral and bone disorder
- Kidney failure and the need for kidney transplant or dialysis
- Other health problems



Take charge of your health.
Visit your doctor regularly.



What Can You Do Now to Protect Your Kidneys?

- If you have **high blood pressure**, keep it under control. Ask your doctor what your blood pressure goal is and how you can reach that goal.
- If you have **diabetes**, keep it under control. Know your goal for hemoglobin A1c level and get to that goal.
- Take your **prescribed medicines** as your doctor advises.
- **Live a healthy lifestyle**
 - Eat less salt and fat.
 - Exercise.
 - Lose weight if you are overweight.
 - Don't smoke.



- **Be careful** about taking over-the-counter pain medicines too often. Ask your pharmacist which over-the-counter medicines are harmful to the kidneys.



- **Avoid** drinking too much alcohol.



- **See your doctor regularly.**
- **Ask for the 2 simple tests** if you are at risk for chronic kidney disease.

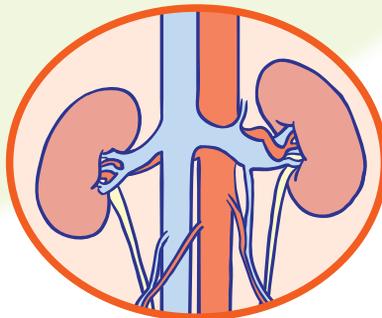
(See pages 16 and 17.)

Know Your Numbers!

TEST	Date/ Numbers	Date/ Numbers	Date/ Numbers
Blood pressure			
Blood sugar (glucose)			
GFR			
Protein in urine			
Cholesterol			
Other			

REMEMBER!

- **Kidney disease has no symptoms.**
- **Know your risks for getting chronic kidney disease.** (See page 7.)
- **If you are at risk for kidney disease, get 2 simple tests!** (See pages 16 and 17.)
- **If you have diabetes or high blood pressure, know your goals for treatment. Work with your doctor to meet your goals.**
- **Chronic kidney disease can be treated.**
- **Live a healthy lifestyle.**
- **Learn and do all you can to keep healthy.**



To learn more about kidney disease:

Talk with your doctor. All questions about your health are worth asking. Sometimes questions come up only after leaving the doctor's office. Write them down for when you talk with the doctor again.

Take the **Kidney Quiz** on page 30.

Or go to our website and take the Kidney Quiz:

www.kidney.org/kidneydisease/kidneyquiz.cfm

Learn more at: **www.kidney.org**

Contact the

**NKF Cares patient help line at
855.NKF.CARES (855.653.2273)**

nkfcares@kidney.org

for a **free** copy of these brochures and others:

Are You at Increased Risk for Chronic Kidney Disease? (11-10-1814)

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

Diabetes and Your Eyes, Heart, Nerves, Feet and Kidneys
(11-10-0216)

High Blood Pressure and CKD for People with CKD Stages 1–4
(11-10-0212)

Your Kidneys: Master Chemists of the Body (11-10-0103)

Urinary Tract Infections (11-10-0205)

Other helpful sources:

The National Kidney and Urologic Diseases Information Clearinghouse

3 Information Way
Bethesda, MD 20892-3580
800.891.5390

www.kidney.niddk.nih.gov

The American Diabetes Association

ATTN: National Call Center
1701 North Beauregard Street
Alexandria, VA 22311
800.DIABETES (800.342.2383)

www.diabetes.org

e-mail: **AskADA@diabetes.org**

WORDS YOU NEED TO KNOW

Albumin: A type of protein. It is not normally in the urine. When it's found in the urine, it means there is a problem with the kidneys.

Anemia: This is a condition where the body does not have enough red blood cells. It is detected by low levels of hemoglobin. Hemoglobin is a substance that brings oxygen to all parts of your body.

Chronic: A condition lasting for more than a few months. A chronic condition is not likely to get better.

Chronic Kidney Disease–Mineral and Bone Disorder (CKD-MBD): This condition causes problems in the strength of your bones and the amount of minerals (like calcium) in your body. It can also affect hormones and blood vessels.

CKD: Chronic kidney disease (CKD) is having kidney damage or moderate loss of kidney function for 3 or more months. There are 5 stages of CKD.

Creatinine: A natural waste product that your body produces when your muscles work. Healthy kidneys remove creatinine from the blood.

Dialysis: A treatment for kidney failure. Dialysis takes over for failing kidneys. It cleans wastes from the blood using a machine or other special equipment. Kidney failure is also called stage 5 CKD.

GFR: Glomerular filtration rate (GFR) is an estimate of kidney function. Lower numbers mean less kidney function. A normal level is usually more than 90.

Glomeruli: Glomeruli are very small, important parts of the kidney. They are part of nephrons (kidney filtering units).

Glucose: A type of sugar found in the blood. When someone has diabetes, the blood glucose levels can be too high. This can damage the kidneys.

Hormones: Hormones are chemical “messengers.” They carry messages to parts of the body. Hormones are made by several different organs. The kidneys make three important hormones. These hormones send “messages” that affect red blood cells, blood pressure, and bones.

Microalbuminuria: The medical term for small amounts of albumin (a protein) in the urine. Microalbuminuria is an early sign of kidney damage.

NSAIDs: This is an abbreviation for non-steroidal anti-inflammatory drugs. These drugs treat pain and fever. They can damage the kidneys when used too often.

Polycystic: “Poly” means many. “Cystic” refers to cysts, which are like small blisters. Polycystic kidney disease is an inherited disease where the kidneys have many cysts, which can replace the normal kidney tissue and reduce kidney function.

Ureters: The tubes that carry urine from the kidneys to the bladder.

TAKE THE KIDNEY QUIZ

The Kidney Quiz is fun, quick and informative. All the answers are based on information in this booklet. See how much you've learned!

- 1. How many kidneys do most people have?**
 - a. Two
 - b. Three
 - c. Four

- 2. How big are your kidneys?**
 - a. About the size of your head
 - b. About the size of your fist
 - c. About the size of your eye

- 3. Where are your kidneys?**
 - a. In the back of your body, just under your rib cage
 - b. In the back of your body, behind your shoulder blades
 - c. In the front of your body, by your belly button

- 4. Which of the following are main jobs of your kidneys?**
 - a. To clean the blood
 - b. To support healthy bones and tissues by producing the active form of vitamin D
 - c. To help keep your blood pressure normal
 - d. All of the above

- 5. Who can get kidney disease?**
 - a. Children
 - b. Adults/teens
 - c. Anyone, at any age

- 6. If your kidneys fail, you'll need a kidney transplant or dialysis.**
 - a. True
 - b. False

7. **What can you do to keep your kidneys healthy?**
 - a. Don't overuse NSAIDs (over-the-counter medicines for pain and fever)
 - b. Control high blood pressure
 - c. Eat healthy and exercise
 - d. All of the above

8. **You're at risk for kidney disease if you have:**
 - a. Diabetes
 - b. High blood pressure
 - c. Family history of kidney failure
 - d. All of the above

9. **1 in 7 American adults has kidney disease.**
 - a. True
 - b. False

10. **Chronic kidney disease can be detected and treated early, which may slow it from getting worse.**
 - a. True
 - b. False

Question 1—A (Two).
 Question 2—B (About the size of your fist).
 Question 3—A (In the back of your body, just under your rib cage).
 Question 4—D (All of the above).
 Question 5—C (Anyone, at any age).
 Question 6—A (True) (If your kidneys fail, you'll need a kidney transplant or dialysis).
 Question 7—D (All of the above).
 Question 8—D (All of the above).
 Question 9—A (True) (1 in 7 American adults has kidney disease—and most don't know it!).
 Question 10—A (True) (Chronic kidney disease can be detected and treated early, which may slow it from getting worse).

Answers:

Learn About **Kidneys and Kidney Disease**

Find out why 1 in 7 American adults has kidney disease — and most don't know it.

See if you are at risk for kidney disease.

Learn about the 2 simple tests you can have to determine the health of your kidneys.

Get tips for keeping your kidneys as healthy as they can be.

Help fight kidney disease.
Learn more at **www.kidney.org**



National
Kidney
Foundation™

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