

HIGH BLOOD PRESSURE AND CHRONIC KIDNEY DISEASE



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High Blood Pressure and Chronic Kidney Disease

Blood pressure is an important measurement of your health. It tells you how hard your blood is pushing against the walls of your arteries. This measurement provides valuable information about your body's functioning. When your blood pressure is at the right level, your body gets the oxygen and nutrients it needs. Keeping your blood pressure in a healthy range is important for your overall health and well-being.

High blood pressure, or hypertension, happens when blood pushes against your artery walls too hard and for too long. Many things can cause high blood pressure, including:

- Getting older
- Having a family history of high blood pressure
- Being overweight
- Not physically active
- Using tobacco
- Eating too much salt

- Drinking too much alcohol
- Having too much stress

High blood pressure can cause problems in your body. It makes your heart work too hard, can damage your arteries, and increase the risk of heart disease, stroke, and chronic kidney disease.

High blood pressure and chronic kidney disease (CKD) are closely linked. Approximately 1 in 5 people have high blood pressure, and many are at risk of developing CKD due to the harmful effects of long-term high blood pressure on the kidneys. When blood pushes too hard in your kidneys, it can lead to CKD over time.

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Did you know —

High blood pressure is the second leading cause of CKD?

Diabetes is the first.

Likewise, CKD can contribute to high blood pressure. When your kidneys don't work well, they struggle to keep salt and water balanced in your body, causing high blood pressure. It's a two-way relationship, which is why it's so important both conditions are managed well.

High Blood Pressure and Kidney Damage

High blood pressure can hurt your kidneys in two ways:

- **Damage blood vessels in the kidneys:** High blood pressure can harm blood vessels in the kidneys, making them less able to clean your blood
- **Makes the kidneys work too hard:** High blood pressure forces the kidneys to work harder and clean more blood than normal which can cause kidney damage



Protecting Your Kidneys When You Have High Blood Pressure

Having high blood pressure doesn't mean you'll definitely get CKD. There are steps you can take to lower your risk such as:

- **Eat a healthy diet:** Eat various fruits, vegetables, whole grains, and lean proteins. Limit your intake of saturated and trans fats, cholesterol-rich foods, and processed foods.
- **Take prescribed medications:** If your healthcare provider has prescribed cholesterol-lowering or blood pressure medications, take them as directed. These medications can help control blood pressure and reduce the strain on your kidneys.



- **Be active:** Regular physical activity can help to maintain a healthy weight, improve blood circulation, and manage your blood pressure. Aim for at least 150 minutes of moderate-intensity aerobic exercise per week.
- **Manage your weight:** Maintaining a healthy weight is a key step for people with high blood pressure. If you are overweight, losing even a small amount of weight can make a big difference in your overall health.
- **Avoid smoking:** Smoking damages your blood vessels and increases the risk of developing high blood pressure and CKD. Quitting smoking can significantly improve your heart health and protect your kidneys.
- **Drink less alcohol:** Drinking too much can raise your blood pressure.



Tests for High Blood Pressure and CKD

You can't take care of something if you don't know it's there. Regular testing can help keep high blood pressure and CKD under control. These are some of the common tests used to screen and monitor high blood pressure and CKD:

- **High blood pressure:**
 - » Home blood pressure machines
 - » Electrocardiograms (EKGs), which measure and record electrical activity in the heart
 - » Calculate your body mass index (BMI) by comparing your weight to your height
 - » Regularly checking the levels of fat in your blood
 - » A1C to screen and manage prediabetes and diabetes

| TYPE OF TEST | WHY IT'S IMPORTANT |
|--|--|
| Blood Pressure | High blood pressure can damage small blood vessels (glomeruli) in the kidneys. It is the second-leading cause of kidney failure after diabetes. |
| A1C (hemoglobin A1C) | A blood test that measures the percentage of glucose, or sugar, that's in your blood. The test is used to diagnose prediabetes and diabetes. |
| ACR (albumin-to-creatinine ratio) | <p>Traces of a type of protein called albumin in the urine (albuminuria) may be an early sign of kidney disease.</p> <p>Increased amounts of albumin and other proteins in the urine (proteinuria) indicate kidney damage.</p> |
| eGFR (estimated glomerular filtration rate) | Test is used to measure how well the kidneys are working by checking creatinine levels in blood and using a calculation to find out your glomerular filtration rate (GFR). |

- **CKD:**

- » Estimated glomerular filtration rate (eGFR) sees how well your kidneys are working
- » Urine albumin-to-creatinine ration (uACR) checks for protein in your pee, which may be a sign of kidney damage
- » Ultrasound or CT scan shows a picture of your kidneys and urinary system. These pictures show the size of your kidneys. Tumors, kidney stones, or cysts can also be seen on a scan

TARGET GOAL

- **Good** — 140/90 or lower
- **Better** — 130/80 or lower
- **Best** — 120/80 or lower

Check with your healthcare team to see if your blood pressure is at the right level for you.

- **Normal** — 5.7% or lower
- **Prediabetes** — Between 5.7% and 6.4%
- **Diabetes** — 6.5% or over

Under 30 mg of albumin per gram of urinary creatinine (a normal waste product)

- Over 90 is good
- 60-89 should be monitored
- Less than 60 for 3 months indicates kidney disease

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Did you know —

People who have received a kidney transplant can develop CKD and high blood pressure?

Regular check-ups and living a healthy lifestyle can help protect your new kidney!

Cholesterol, Fats, High Blood Pressure, and CKD

When it comes to cholesterol and fats in your blood, it's important to keep them in check. Just like hard butter can clog your arteries, high cholesterol levels, and other fats in your blood can lead to health problems and can contribute to the development of high blood pressure and cause harm to your kidneys.

High blood pressure can be caused and get worse by eating an unhealthy diet high in cholesterol and unhealthy fats. These substances can build up in your blood vessels, making them narrower and less flexible. As a result, your heart has to work harder to pump blood through these narrowed vessels, leading to an increase in blood pressure.

High cholesterol and fats in your blood can also harm your kidneys. When your blood vessels become damaged or narrowed, it affects the blood flow to your kidneys. This can reduce their ability to effectively filter waste and excess fluids from your blood. Over time, this can lead to kidney damage and increase the risk of developing CKD.

By making healthy lifestyle choices and following your healthcare provider's recommendations, you can help manage your cholesterol and fat levels, reduce your risk of high blood pressure, and safeguard the health of your kidneys. Remember, even small steps towards a healthier lifestyle can lead to big improvements in your overall well-being.



Pregnancy, High Blood Pressure, and CKD

Pregnancy can have several risks for women with CKD and high blood pressure. Here are the important things to be aware of:

- **Pre-eclampsia:** This is when a pregnant woman has high blood pressure and has signs that some of her organs, like her kidneys and liver, may not be working normally. It usually starts after the 20th week of pregnancy in women whose blood pressure had been normal.

Pre-eclampsia can be dangerous for the mother and the baby if not treated. It can stop the baby from getting enough blood and oxygen. It can also cause harm to the mom's kidneys and liver.



- **Eclampsia:** This is a more severe form of preeclampsia and it can lead to seizures in the mother. If not treated, it can cause coma and even death for both the mother and the baby.
- **Gestational hypertension:** High blood pressure that starts after the 20th week of pregnancy can lead to gestational hypertension. This condition differs from pre-eclampsia because there are no signs of organ injury.

Gestational hypertension may increase the likelihood of preterm birth, low birth weight, and placental abruption (when the placenta becomes detached from the uterus before delivery).

- **Worsening kidney function:** Pregnancy places extra stress on the kidneys, especially for women who already have CKD. Depending on the severity of kidney function loss, additional treatments such as dialysis, may be needed.

- **Acute kidney injury (AKI):** A sudden loss of kidney function and women with high blood pressure and CKD are at increased risk. AKI can occur during pregnancy and poses risks to both the mother and the baby. It is important to seek medical attention immediately to treat an AKI.
- **Premature birth:** Women with CKD and high blood pressure have an increased risk of delivering their baby prematurely, before 37 weeks of pregnancy. Premature infants may require specialized care due to potential health complications.
- **Fetal growth restriction:** Having both CKD and high blood pressure during pregnancy may impact the baby's growth, leading to fetal growth restriction (when a baby in the uterus does not grow to normal weight during pregnancy). This can result in a low-birth-weight baby with a higher risk of having medical problems.
- **Increased risk of cesarean delivery:** Women with CKD and high blood pressure may have a higher likelihood of needing a cesarean section (C-section) for delivery.

Regular checks with a healthcare provider during pregnancy can find these problems early. Your healthcare provider can then work with you to make sure your pregnancy is as safe as possible.

Key Points To Remember

Understanding the link between high blood pressure and CKD is important for overall health. High blood pressure can harm your kidneys over time, leading to CKD. On the other hand, CKD can also contribute to high blood pressure. It's a two-way relationship.

To prevent CKD, it's necessary to manage your high blood pressure effectively. This includes making healthy lifestyle choices and following your health-care provider's advice. By reducing your salt intake, being physically active, maintaining a healthy weight, and limiting alcohol, you can lower your risk of developing CKD. Taking prescribed medications as directed is also important for controlling blood pressure and protecting your kidneys.

High blood pressure damages the blood vessels in your kidneys, making it harder for them to filter waste and maintain a proper balance of fluids. Regular monitoring through recommended tests, such as EKG, BMI assessments, and lipid profiles for high blood pressure, as well as eGFR and uACR tests for CKD, can help catch issues early.

Remember, small steps can make a big difference in keeping your blood pressure under control and maintaining kidney health.

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



We Are Here To Help

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

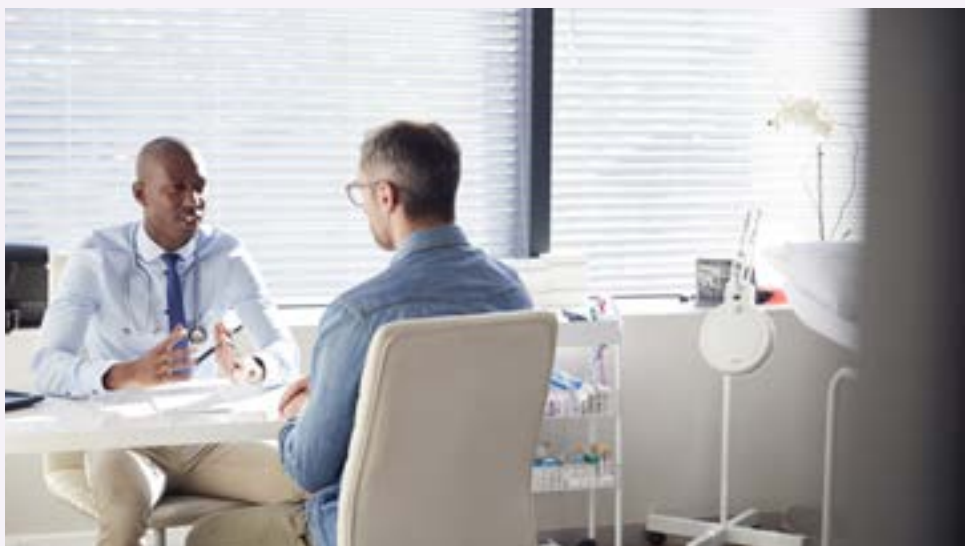
Call the National Kidney Foundation Cares Patient Help Line toll-free at **855.NKF.CARES (855.653.2273)** or email **nkfcares@kidney.org**

Learn more at **[kidney.org](https://www.kidney.org)**

Setting a Standard for Care

The National Kidney Foundation, through its *Kidney Disease Outcomes Quality Initiative* (KDOQI®), defines stages of kidney disease and offers guidelines that help your doctor and healthcare team make important decisions about your medical treatment.

The information in this booklet is based on those recommended guidelines.



The information contained in this publication is based on current data and expert guidance available at the time of publication. The information is intended to help patients become aware of their disease and its management. This publication is not intended to set out a preferred standard of care and should not be construed as one. Neither should the information be interpreted as prescribing an exclusive course of management. Patients should always consult with their healthcare providers regarding decisions about their individual plan of care.



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The National Kidney Foundation is revolutionizing the fight to save lives by eliminating preventable kidney disease, accelerating innovation for the dignity of the patient experience, and dismantling structural inequities in kidney care, dialysis, and transplantation.

30 E. 33RD ST. | NEW YORK, NY 10016 | 800.622.9010

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