Kidney disease and the Cardiovascular, Renal, Metabolism cluster

Introduction

In chronic kidney disease, the kidneys lose their ability to function effectively, leading to an accumulation of waste products in the body. Kidney disease, cardiovascular disease and diabetes may co-occur, forming a disease cluster called Cardiovascular Renal Metabolism (CVRM) disease. Learn how these conditions are interlinked and how best to combat them for great overall health.

Contents:

What is CVRM?

Every organ in the body has a unique role but also relies on the harmonious functioning of other organs. When one doesn't function optimally, it can strain the others, impacting overall health. A key illustration of this interconnectedness is how the heart, kidneys and pancreas relate to each other, and the linked conditions of cardiovascular disease, chronic kidney disease and Type 2 diabetes.

This interconnected system is referred to as **“CVRM”**:

CV: Cardiovascular - refers to the circulatory system, encompassing the heart and blood vessels.

R: Renal - relates to the kidneys. When affected by chronic kidney disease (CKD), the kidneys struggle to effectively remove waste and toxins from the bloodstream.

M: Metabolism - this denotes the role of the pancreas. The pancreas secretes enzymes and hormones, especially insulin, essential for digesting food and regulating blood sugar. Type 2 diabetes is the primary condition linked to metabolic dysfunction.[1,2,3]

What is chronic kidney disease (CKD)?

The kidneys perform an essential function of filtering the blood, to remove waste, toxins and excess fluid via the urine. They also help control blood pressure and maintain the balance of chemicals in the blood.

In chronic kidney disease (CKD), over time the kidneys become damaged and can no longer filter the blood properly. This can cause build-up of fluid and waste, which may lead to further health problems, such as heart disease.[4]

Causes and risk factors

Your chances of developing CKD increase with:[5,6]

- **Type 2 diabetes.** High blood sugar from uncontrolled diabetes can damage blood vessels in your kidneys, reducing their ability to function.

- **Hypertension (high blood pressure)** can also damage the kidneys' blood vessels.

- **Glomerulonephritis**: the glomeruli, tiny filters in the kidneys, become inflamed and will not function properly.

- **Genetic kidney diseases** e.g. autosomal dominant polycystic kidney disease, which causes cysts to develop - the kidneys enlarge and lose function.

- **Obstructions** e.g. enlarged prostate, tumours and kidney stones can cause back-up of urine in the kidneys.

- **Long-term use of certain medications** e.g. anti-inflammatories, may be toxic to the kidneys.

- **Family history**: having a parent or sibling with CKD.

- **Older age:** CKD risk rises with age. The longer you have had diabetes, hypertension or heart disease, the greater your risk for kidney disease.

Symptoms

In early-stage CKD, symptoms may not be obvious. In more advanced stages, symptoms may include:[5]

- Swelling in hands or feet
- Poor appetite
- Trouble sleeping
- Breathlessness
- Fatigue
- Blood in urine
- Itchy skin
- Muscle pain
- Nausea
- Headache.

Diagnosis

CKD may be suspected from the results of a routine test for another medical issue. If there is blood in your urine, your doctor may refer you to a specialist who will perform additional blood and urine tests to check for:

- **Albumin**, a protein that healthy kidneys filter out before it enters the urine. Albumin in the urine indicates your kidneys aren't functioning optimally.
- **Creatinine**, a waste product that may build up in kidneys with CKD. The glomerular filtration rate (eGFR) is calculated from creatinine blood levels to determine how well your kidneys are filtering the blood.

Your test results help your doctor to estimate the degree of damage to your kidneys - or the stage of chronic kidney disease.

Stage of CKD	eGFR result	Kidney function
Stage 1	90 or higher	Mild damage Kidneys work as well as normal
Stage 2	60-89	Mild damage Kidneys still work well
Stage 3a	45-59	Mild - moderate damage Kidneys don't work as well as they should
Stage 3b	30-44	Moderate - severe damage Kidneys don't work as well as they should
Stage 4	15-29	Severe damage Kidneys close to not working
Stage 5	Less than 15	Most severe damage Kidneys very close to not working, or have stopped working/failed.

The Five Stages of Kidney Disease [7]

A **biopsy** (taking a tissue sample for laboratory examination) may be also be done to help determine the underlying cause of kidney disease.[4,5,7]

Treatment

Treatment depends on the CKD stage.

In early-stage CKD, lifestyle changes and medication aimed at underlying causes help to minimise further damage. For example, medicine for hypertension (such as angiotensin-converting enzyme inhibitors and angiotensin II receptor blockers) may have an additional protective effect on your kidneys.

In most cases, CKD remains stable once the cause is addressed. However, the condition can worsen and may eventually lead to kidney failure, when the kidneys stop working. This can be managed with dialysis: using a machine to filter the blood. Kidney transplant is an alternative to dialysis for people with severely reduced kidney function.[4,5,8]

Links between kidney and heart disease

The kidneys remove toxins and excess fluid from the blood, and the heart pumps blood to the rest of the body (including the kidneys). Given the close relationship between these organ systems, when one isn't working properly, the other will be negatively affected.

When the kidneys aren't filtering waste efficiently, the volume and composition of the blood changes. This can make the heart work harder to circulate the blood, leading to hypertension. Over time, this may damage the heart and blood vessels, which in turn could worsen CKD.[3]

Links between kidney disease and type 2 diabetes

In Type 2 diabetes, high blood sugar levels result from the pancreas not producing enough of the hormone insulin, or from resistance to the effective action of insulin in the body.

Uncontrolled high blood sugar can harm blood vessels in your kidneys, making it harder for them to filter the blood.

Around half of people with type 2 diabetes show signs of kidney disease.

Because the two organ systems are so closely related, getting diabetes under control can help improve kidney health and limit further damage from high blood sugar.[3,5]

Take action for your health

To help prevent kidney disease and lower the risk for further damage if you have CKD:[1,9,10,11]

- **Take medication exactly as instructed**. Before starting any new medicine, check with your doctor that it won't potentially harm your kidneys. Avoid anti-inflammatory medication except when medically advised.

- **Get regular checkups, including testing** if you have risk factors for CKD, to ensure kidney disease and other conditions are caught early.

- **Stay within your target blood sugar range** if you have diabetes.

- **Keep blood pressure below 140/90 mm Hg**, or the target your doctor sets.

- **Make healthy lifestyle changes:**
    - **Follow a healthy diet** high in fruit, vegetables and lean protein; and low in processed food, sugar and salt. Swap refined carbs (white bread, pasta, sugary cereals) for whole grains; steam, boil, grill or air-fry with a little vegetable oil instead of frying in animal fat; replace high-salt condiments with herbs, spices and citrus.
    - **Maintain a healthy weight**.
    - **Get regular exercise**: physical activity helps control blood pressure and sugar levels. Build up to minimum 150 minutes aerobic exercise weekly, plus bi-weekly strength training. Walk whenever you can - take the stairs instead of the lift; park a little further from your destination to get in extra steps.
    - **Don't smoke**. Smoking can worsen kidney disease and interfere with blood pressure medication.
    - **Drink less.** Excessive alcohol raises blood pressure.

- **Remember your mental health.** The challenges associated with CKD and its treatment can put you at risk of stress and depression. If you're experiencing a persistent low mood or anxiety, ask your doctor for a referral to a therapist. Get support from friends and family, and connect with others on a similar journey - patient organisations and support groups are valuable resources. Contact the National Kidney Foundation of South Africa (https://nkf.org.za/) for more information.

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Chronic Kidney Disease, Diabetes, and Heart Disease

KEY POINTS

Chronic kidney disease (CKD), diabetes, and heart disease are connected.

Find out why and how you can prevent or manage all three.

About CKD, diabetes, and heart disease

The relationship between CKD, diabetes, and heart disease is one example of the ways our organs are connected. When one organ isn't working properly, it can put stress on other organs, causing them to stop working properly as well.

Your body uses a hormone called insulin that moves sugars from the blood and into your body's cells for energy. If someone has diabetes, they either don't make enough insulin or can't use the insulin well.

If someone has CKD, their kidneys don't filter out toxins and waste from their blood as well as they should.

Heart disease refers to several types of heart conditions. The most common condition, coronary artery disease, leads to changes in blood flow to the heart. This can cause a heart attack.

Make the connection

So how are these three conditions connected? Risk factors for each condition are similar and include:

High blood sugar.
High blood pressure.
Family history.
Obesity.
Unhealthy diet.
Physical inactivity.

High blood sugar can slowly damage the kidneys. Over time, they may stop filtering blood as well as they should, leading to CKD. Approximately 1 in 3 U.S. adults with diabetes has CKD.

When the kidneys don't work well, it puts stress on the heart. When someone has CKD, their heart needs to pump harder to get blood to the kidneys. This can lead to heart disease, the leading cause of death in the United States. Change in blood pressure is also a CKD complication that can lead to heart disease.

Tips to prevent or manage all three

The good news is that you can manage or prevent CKD, diabetes, and heart disease all at once. These five tips can help you get started:

Get active
Being active can help prevent or manage CKD, diabetes, and heart disease. Find an activity you like, start small, and get moving!

Choose healthy foods and drinks
This is an important way to give your body the fuel it needs to function properly. Adding more fruits and veggies to your plate can also help you keep a healthy weight. This is a great way to prevent or manage CKD, diabetes and heart disease.

Quit smoking
Quitting is one of the best things you can do for your health. It'll help you prevent CKD, type 2 diabetes, and heart disease. It also helps to improve any of these conditions if you have them. You don't have to do it alone! For support, visit I'm Ready To Quit.

Find out your risk for prediabetes
Know where you stand by taking this 1-minute prediabetes risk test. If your risk is high, talk to your doctor about taking action to prevent or delay type 2 diabetes. The lifestyle change program through CDC's National Diabetes Prevention Program can help you build the healthy habits you need to succeed.

Get your annual flu shot
People with chronic diseases are more likely to have health complications if they catch the flu. These complications can worsen an existing condition and can even be fatal.

Protect your heart if you have CKD
Over time, CKD often gets worse and can lead to kidney failure. People with kidney failure will need regular dialysis (a treatment that filters the blood) or a kidney transplant to survive.

Heart disease is the most common cause of death for someone on dialysis. When your kidneys don't function properly, the heart has to work harder to circulate blood. This may lead to high blood pressure and possibly heart disease.

Tips to help protect your heart and kidneys:
Choose foods that are healthiest for your heart and your kidneys. Ask your doctor for a referral to a dietitian to understand which foods and drinks are best for you. Learn more about dialysis and a healthy diet.

Get regular physical activity to help lower your blood pressure and improve your heart health. And remember that moving more doesn't have to be strenuous. Some great ways to get active are gardening, yoga, or brisk walking around the block. Ask your doctor about which activities are best for you and if there are any you should avoid.

Manage your weight and blood sugar by changing your diet and activity routine. For extra help, you can work with a dietitian to create an eating plan that works for you and your kidneys.

2.American Heart Association, 2024. What is cardiovascular disease? [online] Available at: https://www.heart.org/en/health-topics/consumer-healthcare/what-is-cardiovascular-disease [Accessed 24 June 2024.

What is Cardiovascular Disease?
Cardiovascular disease can refer to a number of conditions:

Heart disease
Heart and blood vessel disease, also called heart disease, includes numerous problems, many of which are related to atherosclerosis.

Atherosclerosis is a condition that develops when a substance called plaque builds up in the walls of the arteries. This buildup narrows the arteries, making it harder for blood to flow through. If a blood clot forms, it can block the blood flow. This can cause a heart attack or stroke.

Heart attack
A heart attack occurs when the blood flow to a part of the heart is blocked by a blood clot. If this clot cuts off the blood flow completely, the part of the heart muscle supplied by that artery begins to die.

Most people survive their first heart attack and return to their normal lives, enjoying many more productive years. But having a heart attack does mean that you need to make some changes.

The medications and lifestyle changes that your health care professional recommends may vary according to how badly your heart was damaged, and to what degree of heart disease caused the heart attack.

Learn more about heart attack.

Stroke
An ischemic stroke, which is the most common type of stroke, occurs when a blood vessel that feeds the brain gets blocked, usually from a blood clot.

When the blood supply to a part of the brain is cut off, some brain cells will begin to die. This can result in the loss of functions controlled by that part of the brain, such as walking or talking.

A hemorrhagic stroke occurs when a blood vessel within the brain bursts. This is most often caused by uncontrolled high blood pressure.

Some effects of stroke are permanent if too many brain cells die after being starved of oxygen. These cells are never replaced.

The good news is that sometimes brain cells don’t die during stroke — instead, the damage is temporary. Over time, as injured cells repair themselves, previously impaired function improves. In other cases, undamaged brain cells nearby may take over for the areas of the brain that were injured.

Either way, strength may return, speech may get better and memory may improve. This recovery process is what stroke rehabilitation is all about.

Learn more about stroke.

Heart failure
Heart failure, sometimes called congestive heart failure, means the heart isn't pumping blood as well as it should. Heart failure does not mean that the heart stops beating — that's a common misperception. Instead, the heart keeps working, but the body's need for blood and oxygen isn't being met.

Heart failure can get worse if left untreated. If your loved one has heart failure, it's very important to follow their health care professional's treatment plan.

Learn more about heart failure.

Arrhythmia
Arrhythmia refers to an abnormal heart rhythm. There are various types of arrhythmias. The heart can beat too slow, too fast or irregularly.

Bradycardia, or a heart rate that's too slow, is when the heart rate is less than 60 beats per minute. Tachycardia, or a heart rate that's too fast, refers to a heart rate of more than 100 beats per minute.

An arrhythmia can affect how well your heart works. With an irregular heartbeat, your heart may not be able to pump enough blood to meet your body's needs.

Learn more about arrhythmia.

Heart valve problems
When heart valves don't open enough to allow the blood to flow through as it should, a condition called stenosis results. When the heart valves don't close properly and thus allow blood to leak through, it's called regurgitation. If the valve leaflets bulge or prolapse back into the upper chamber, it's a condition called prolapse. Discover more about the roles your heart valves play in healthy circulation.

Learn more about heart valve disease.

Common treatments
Here are some common treatments for different types of cardiovascular disease:

Heart valve problems
Medications
Heart valve surgery
Arrhythmia
Medications
Pacemaker
Electric cardioversion
Catheter ablation
Lifestyle changes
Heart attack

Medications
Coronary angioplasty
Coronary artery bypass graft surgery
Heart transplant or other heart surgery
Radiofrequency ablation
Stent procedure
Transmyocardial revascularization
Lifestyle changes
Stroke
Medications
Carotid endarterectomy (PDF)(link opens in new window)
Thrombectomy
Aneurysm clipping
Coil embolization
Blood transfusion
Lifestyle changes
Diagnostic tests, surgical procedures and medications
In the hospital and during the first few weeks at home, your health care professional may perform several tests and procedures. These tests help them determine what caused the stroke or heart attack, and how much damage was done. Some tests monitor your progress to see if the treatment is working.

Learn more about diagnostic tests and procedures.

Learn more about surgical procedures that may have been performed at the hospital.

Cardiac medications
The medications prescribed after a cardiovascular event can aid in recovery and help prevent another heart attack or stroke.

If you're a caregiver, make sure your loved one takes their medications as directed and on time. Learn about the medications that your loved takes. Know what those medicines do, and what their goal is.

It's important to follow your health care professional's directions closely, so ask questions and take notes.

It's important to follow your doctor's directions closely, so ask questions and take notes. Learn more about cardiac medications.

Written by American Heart Association editorial staff and reviewed by science and medicine advisors.
See our editorial policies and staff.

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3.Organs Talk, 2021. [online] Learn about chronic kidney disease and the interconnected systems. Available at: https://www.organs-talk.com/ckd/interconnected-systems [Accessed 24 June 2024].

Learn about chronic kidney disease and the interconnected systems
'Everybody's journey is different.'

What is the connection between the kidneys and type 2 diabetes?
Blood sugar levels and the kidneys are interconnected, meaning that when a person has a disease that affects their blood sugar levels, like type 2 diabetes, they are likely to experience kidney problems if their blood sugar levels aren't controlled.1

Type 2 diabetes is characterized by high levels of blood sugar, resulting from the pancreas not producing enough of the hormone insulin, or resistance of insulin action in the body.2

Over time, uncontrolled high blood sugar can damage the blood vessels in your kidneys, making it harder for them to filter your blood. If left unchecked and untreated, damage to the kidneys can ultimately result in kidney failure and a need for dialysis (the process of removing excess water and toxins from the blood by a machine) or kidney transplantation.3

Type 2 diabetes can also cause high blood pressure which is one of the major causes of chronic kidney disease. Doctors will often prescribe treatments to help control your blood pressure as well as your blood sugar, to prevent further damage to your kidneys.4

Because the two organ systems are so closely related, getting your diabetes under control can help to improve your kidney health and limit further damage caused by high blood sugar.4

Did you know:
Approximately half of people with type 2 diabetes have some level of kidney disease.5
If you have questions or concerns about the interconnectivity of these conditions, speak to your doctor.

What is the connection between the kidneys and the heart?
The heart and the kidneys work very closely together to keep you healthy.

Your kidneys remove toxins and excess water from your blood, and your heart pumps blood to the rest of your body (including your kidneys). Due to the close relationship between the organ systems, when one isn't functioning properly, the other is affected.6

When the kidneys aren't working properly to filter waste, the volume and composition of your blood changes, which can result in your heart having to work harder to pump blood around the body. In the

long term, this may cause damage to the heart and blood vessels, which in turn could make your kidney disease worse.7,8

This means people with kidney disease are at risk of developing heart disease, and people with heart disease are at risk of developing kidney disease.8

Ask your health care provider(s) what steps you can take to reduce your chances of getting heart disease or help keep your heart disease from getting worse.9

If you have questions or concerns about the interconnectivity of these conditions, speak to your doctor.

4.Centers for Disease Control and Prevention, 2022. Chronic Kidney Disease Basics. [online] Available at: https://www.cdc.gov/kidney-disease/about/ [Accessed 24 June 2024].

Chronic Kidney Disease Basics
KEY POINTS
More than 1 in 7 American adults has chronic kidney disease (CKD).
Specific blood and urine tests are needed to check for CKD.
CKD can be treated (the earlier treatment starts the better).
MORE INFORMATION
About your kidneys and CKD
Your hard-working kidneys
Your kidneys, each just the size of a computer mouse, filter all the blood in your body every 30 minutes. They work hard to remove wastes, toxins, and excess fluid. They also:

Help control blood pressure.
Signal the body to make red blood cells.
Help keep your bones healthy.
Regulate blood chemicals that are essential to life.
Kidneys that function properly are critical for maintaining good health.

CKD
CKD is a condition in which the kidneys are damaged and can't filter blood as well as they should. Because of this, excess fluid and waste remain in the body and may cause health problems such as heart disease.

Other health problems related to CKD include:

Anemia or low number of red blood cells.
Increased occurrence of infections.
Low calcium levels, high potassium levels, and high phosphorus levels in the blood.
Loss of appetite or eating less.
Depression or lower quality of life.

CKD has varying levels of seriousness. It usually gets worse over time, though treatment has been shown to slow progression. CKD can progress to kidney failure and early cardiovascular disease.

When the kidneys stop working, dialysis or kidney transplant is needed for survival. Kidney failure treated with dialysis or kidney transplant is called end-stage kidney disease. Not all people with kidney disease progress to kidney failure.

Symptoms
People with CKD may not feel ill or notice any symptoms. The only way to find out for sure if you have CKD is through blood and urine tests. These tests measure both the creatinine level in the blood and protein in the urine.

Reducing risk
Keep your blood pressure below 140/90 mm Hg (or the target your doctor sets for you).
If you have diabetes, stay in your target blood sugar range as much as possible.
Get active. Physical activity helps control blood pressure and blood sugar levels.
Lose weight if needed.
Get tested for CKD regularly if you're at risk.
If you have CKD, meet with a dietician to create a kidney-healthy eating plan. The plan may need to change as you get older or if your health status changes.
Take medicines as instructed and ask your doctor about blood pressure medicines called angiotensin-converting enzyme inhibitors and angiotensin II receptor blockers, which may protect your kidneys in addition to lowering blood pressure.
If you smoke, make a plan to quit. Smoking can worsen kidney disease and interfere with medication that lowers blood pressure.
Include a kidney doctor (nephrologist) on your health care team.
Keep Reading: Risk Factors for Chronic Kidney Disease
CKD by the numbers
Kidney diseases are a leading cause of death in the United States.
About 35.5 million US adults are estimated to have CKD, and most are undiagnosed.
40% of people with severely reduced kidney function (not on dialysis) are not aware of having CKD.
Every 24 hours, 360 people begin dialysis treatment for kidney failure.
In the United States, diabetes and high blood pressure are the leading causes of kidney failure, accounting for 2 out of 3 new cases.
In 2019, treating Medicare beneficiaries with CKD cost $87.2 billion, and treating people with end-stage kidney disease cost an additional $37.3 billion.

5.Organs Talk, 2021. Learn about chronic kidney disease. [online] Available at: https://www.organs-talk.com/ckd/about-ckd [Accessed 24 June 2024].

Learn about chronic kidney disease

Get the facts about chronic kidney disease
What is chronic kidney disease?

Chronic kidney disease
A condition caused by progressive damage to the kidneys, that prevents them from working as well as they should.1 The kidneys have an important function to filter the blood in order to convert waste products and excess fluid into urine.

Managing chronic kidney disease
For most people, kidney disease will remain stable once the cause of problem is identified and addressed.2 However, chronic kidney disease can get worse over time and can sometimes lead to kidney failure, so it's important to address any concerns you may have with your healthcare team.2

What causes chronic kidney disease?
Chronic kidney disease can be caused by a variety of factors, but some of the most common are:1

Type 2 diabetes
Over time, uncontrolled high blood sugar caused by diabetes can lead to significant damage to the blood vessels in your kidneys. When the blood vessels are damaged, they don't work as well as they should. Many people with diabetes also develop high blood pressure, which in turn can also affect your kidneys. Kidney disease caused by diabetes is called diabetic kidney disease.3 Proper management of diabetes is vital to your kidney health.

High blood pressure
Over time, high blood pressure can put stress on the blood vessels in your kidneys, which can limit the ability of your kidneys to do their job.4

Autoimmune disorders
In these diseases, the body starts to fight against its own organs and cause the kidney to develop glomerulonephritis. This is where the tiny filters in the kidneys, called glomeruli, become inflamed. Severe or long-term inflammation associated with glomerulonephritis can damage your kidneys.5

Hereditary kidney diseases
Some kidney diseases can be inherited through your genes, such as autosomal dominant polycystic kidney disease (ADPDK) where clusters of cysts cause the kidneys to enlarge and lose function over time.6

Obstructions
Obstructions, such as an enlarged prostate, tumors or kidney stones, can cause a backup of urine within your kidneys.7

Long-term use of certain medicines
Take extra care as long-term use of certain medicines may be toxic to the kidneys e.g., anti-inflammatory medication.8

What are some of the signs and symptoms of chronic kidney disease?
The kidneys are quite resilient and are able to function correctly even when damaged, so in the early stages of chronic kidney disease it's uncommon to experience symptoms.9

While for many people the condition remains stable once diagnosed, it can progress into more advanced stages where you might experience symptoms like:1,2,10
Swelling in the hands, feet or ankles

Poor appetite

Difficulty sleeping

Breathlessness

Tiredness

Blood in your urine

Itchy skin

Muscle pain

Nausea

Headaches

If you or your loved one is experiencing any of these symptoms, talk to your doctor right away.
How is chronic kidney disease diagnosed?
Chronic kidney disease is often diagnosed through a routine blood or urine test for something unrelated – not usually because of symptoms related to chronic kidney disease.9

Occasionally, if there is blood in your urine, a doctor will refer you to the kidney specialist (sometimes called a nephrologist). They will run additional tests to determine if the kidney is the cause of the blood in the urine.

One of the routine blood tests that assesses how your kidneys are working is a test to check your estimated glomerular filtration rate (eGFR), which determines how well your kidneys are filtering your blood.11

Creatinine levels

Your doctor will check the level of creatinine in your blood – this is a waste product that can build up in your kidneys when you have kidney disease.12 The eGFR is calculated from your creatinine levels in the blood.

Urine tests

Your doctor may also request another test to determine the levels of a protein called albumin in your urine. When kidneys are functioning well, they filter out the albumin before it gets into the urine. When albumin is detected, it indicates that your kidneys aren't functioning as well as they should be. The less albumin you have in the urine, the better. The presence of albumin in urine is called albuminuria.13

A biopsy

There may be a need to run additional tests, including a biopsy (a procedure where a small amount of tissue is taken and examined), to try to determine the cause of your kidney disease. Sometimes the underlying cause can be treated, so these tests may help your doctor decide what is the best treatment option for you and how often your kidneys should be monitored.

Your test results

Your test results

These will help your doctor to estimate how damaged your kidneys are – known as the stage of chronic kidney disease. Your eGFR results determine whether you have stage 1-5 kidney disease.14

stage-1

Normal kidney function

Kidneys filter 90 ml or more per minute but other tests have detected signs of kidney damage e.g. albumin in the urine.

Stage-2

Mildly reduced kidney function

Kidneys filter between 60 to 89 ml of blood per minute but there are other signs of kidney damage e.g. albumin in the urine.

Moderately reduced kidney function

Moderately reduced kidney function

Kidneys filter between 30 to 59 ml of blood per minute. Albuminuria, the presence of albumin in the urine, may also accompany this stage.

Severely reduced kidney function
Severely reduced kidney function
Kidneys filter between 15 to 29 ml of blood per minute. Albuminuria, the presence of albumin in the urine, may also accompany this stage.

End-stage kidney failure
End-stage kidney failure
Kidneys filter below 15 ml of blood per minute. Albuminuria, the presence of albumin in the urine, may also accompany this stage. Based on the symptoms and findings from laboratory tests, a replacement therapy such as dialysis might be needed to prevent your body from being poisoned by the buildup of waste products the kidney can no longer remove.14

6.National Kidney Foundation, 2023. What are the main causes of chronic kidney disease? [online] Available at: https://www.kidney.org/atoz/content/about-chronic-kidney-disease#what-are-main-causes-chronic-kidney-disease [Accessed 24 June 2024].

Chronic Kidney Disease (CKD)

About chronic kidney disease (CKD)

Your kidneys do many important jobs. Some of the ways they keep your whole body in balance include:

Removing natural waste products and extra water from your body
Helping make red blood cells
Balancing important minerals in your body
Helping maintain your blood pressure
Keeping your bones healthy
Chronic kidney disease (CKD) is when the kidneys have become damaged over time (for at least 3 months) and have a hard time doing all their important jobs. CKD also increases the risk of other health problems like heart disease and stroke. Developing CKD is usually a very slow process with very few symptoms at first. So, CKD is divided into 5 stages to help guide treatment decisions.

Signs and symptoms

Many people living with CKD do not have any symptoms until the more advanced stages and/or complications develop. If symptoms do happen, they may include:

Foamy urine
Urinating (peeing) more often or less often than usual
Itchy and/or dry skin
Feeling tired
Nausea
Loss of appetite
Weight loss without trying to lose weight
People who have more advanced stages of CKD may also notice:

Trouble concentrating
Numbness or swelling in your arms, legs, ankles, or feet
Achy muscles or cramping
Shortness of breath
Vomiting
Trouble sleeping
Breath smells like ammonia (also described as urine-like or “fishy”)
Check out our online communities to connect, learn more and hear from others going through similar experiences.
Causes

Risk Factors
Anyone can develop CKD - at any age. However, some people are at a higher risk than others. The most common CKD risk factors are:

Diabetes
High blood pressure (hypertension)
Heart disease and/or heart failure
Obesity
Over the age of 60
Family history of CKD or kidney failure
Personal history of acute kidney injury (AKI)
Smoking and/or use of tobacco products
For many people, CKD is not caused by just one reason. Instead, it is a result of many physical, environmental, and social factors. Early detection is important – CKD often begins without causing any noticeable symptoms. Knowing the risk factors can help you know your level of risk and if you should get checked for CKD.

Other causes
CKD can also be caused by many other conditions or circumstances. Some examples include:

Glomerular diseases: glomerulonephritis, IgA nephropathy (IgAN), and HIV nephropathy

Inherited conditions: polycystic kidney disease
Autoimmune conditions: lupus (lupus nephritis)
Severe infections: sepsis and hemolytic uremic syndrome (HUS)
Other causes: kidney cancer, kidney stones, frequent untreated and/or long-lasting urinary tract infections (UTIs), hydronephrosis, and kidney and urinary tract abnormalities before birth
37 million adults in the United States are living with CKD - and approximately 90% do not even know they have it. Take this one-minute quiz to find out if you are at high risk for CKD.

Complications

As CKD worsens, the risk of getting complications goes up. Some examples include:

Cardiovascular disease (heart disease and/or stroke)
High blood pressure
Anemia (low levels of red blood cells)
Metabolic acidosis (buildup of acid in the blood)
Mineral and bone disorder (when blood levels of calcium and phosphorus are out of balance leading to bone and/or heart disease)
Hyperkalemia (high levels of potassium in the blood)
Kidney failure
Some conditions, like cardiovascular disease and high blood pressure, can also cause or worsen CKD.

Give Today
Power lifechanging research, education and advocacy to ensure that every person facing kidney disease gets the chance to thrive—not simply survive.

Give today and help us provide FREE resources, support, and hope for patients, loved ones and healthcare heroes.

FAQs
Diagnosis

Tests
Checking for CKD is easy with two simple tests:

a blood test known as the estimated glomerular filtration rate (eGFR)
a urine test known as the urine albumin-creatinine ratio (uACR)
Both tests are needed to have a clear picture of your kidney health. Having an eGFR under 60 and/or a uACR over 30 for three months or more is a sign you may have kidney disease.

Blood test tube and urine test

The eGFR is an estimate of how well your kidneys are removing waste products from the blood. It is calculated using your serum creatinine level, age, and sex. It can also be calculated using your cystatin C level. A “normal” eGFR varies according to age – it decreases as you get older. For this test, a higher number is better. Your eGFR number is used to determine your stage of CKD.

The uACR measures the amount of two different substances in your urine – albumin (protein) and creatinine. Healthy kidneys keep the albumin in your blood while filtering the creatinine out into the urine. So, there should be very little or no albumin in your urine. The uACR is calculated by dividing the amount of urine albumin by the amount of urine creatinine to find the ratio. For this test, a lower number is better. Your uACR number is used to test for albuminuria - a significant risk factor for complications.

In some cases, your healthcare professional may order additional tests to get more information about your kidney health. Some examples include a kidney biopsy or medical imaging (CT scan, ultrasound, or MRI).

Icono de un riñón lleno al 90%
Understanding my kidney numbers

Watch a playlist of short, animated videos with information about your kidney numbers, including:

A brief explanation of the uACR and eGFR tests
Reading the CKD Heat Map and understanding your risk
Important steps for managing CKD
Watch Videos
Treatment

Overview
Managing CKD is focused on four very important goals:

Managing the disease(s) or condition(s) that are most likely causing the CKD (for example, your diabetes, high blood pressure, or IgA nephropathy)
Taking steps to slow down the CKD disease process directly (also known as “slowing CKD progression”)
Lowering your risk of cardiovascular disease (having a heart attack or stroke)
Treating any complications that you may have because of your CKD
Specific treatment recommendations depend on your stage of CKD and what other health conditions you have (including any CKD complications). Below are recommendations that apply to most people with CKD. No two people are the same, so talk with your healthcare professional about recommendations tailored to you.

Medications

Your healthcare professional may prescribe one or more medicines to help slow down or stop your CKD from getting worse. These medicines can include an ACE inhibitor/ARB, an SGLT2 inhibitor and/or an nsMRA.

Your healthcare professional may also prescribe a statin (cholesterol medicine). Guidelines recommend a statin for people with CKD who also have diabetes, a history of heart disease, or are age 50 or older. Even if you do not have high cholesterol, a statin can help lower your risk of having a heart attack or stroke.

You may also need to take additional medications or supplements to manage any CKD complications you might have (if applicable).

Nutrition

It is important to limit your sodium (salt) intake to less than 2300 mg per day (about 1 teaspoon of salt from all the food and drinks you consume each day). This recommendation is very important if you also have high blood pressure. Your healthcare professional may advise an even lower target depending on your other health conditions. This means a lot more than not using a saltshaker, but also limiting foods with high levels of sodium listed on their nutrition facts label. Some foods that don't taste salty can have a surprising amount of sodium when you check their nutrition facts label.

Based on the results of your blood tests, your healthcare professional or kidney dietitian may also advise you to change how much potassium, phosphorus, and/or calcium you might be getting through your diet.

Meeting with a dietitian can be especially helpful if you also have other health conditions like high blood pressure, diabetes, or heart failure where it is even more important to integrate a healthy diet into your lifestyle to help prevent complications. It can feel overwhelming to keep track of so many changes, and a dietitian can help you identify what works best for you.

Additional information about eating healthy with kidney disease can be found on the Nutrition and Early Kidney Disease page.

Lifestyle recommendations

Now is a great time to make healthier lifestyle choices:

If you smoke and/or use tobacco products, stop. Smoking can speed up the kidney disease process and increase your risk of getting kidney failure. It also increases your risk for other serious health problems, including high blood pressure, heart disease, cancers, and stroke.

Exercise regularly. Remember, it's okay to start slowly – taking short walks is a great way to begin.

Sleeping well is important, too. Try to get enough sleep so you are well-rested.

If you are overweight, losing weight through a balanced diet and physical activity can help improve your health in many ways.

Find ways to reduce and manage stress in your life.

Other ways to lower your risk

Taking steps to manage other health conditions you may also have can also help your CKD. This includes high blood pressure, diabetes, and high cholesterol.

People with CKD should also avoid certain pain medicines known as non-steroid anti-inflammatory drugs (NSAIDs). These can be harmful to your kidneys, especially at higher doses and/or with long-term use. Some examples include:

ibuprofen (Motrin, Advil)
indomethacin (Indocin)
naproxen (Aleve, Naprosyn)
diclofenac tablets or capsules (Cataflam, Zipsor)
celecoxib (Celebrex)
meloxicam (Mobic)
aspirin (only if more than 325 mg per day)

Many of these NSAID medicines are available over-the-counter (OTC) and may be sold under a different name or be mixed with other ingredients (like cough & cold medicines). Sometimes it may not be possible to avoid using these products depending on your other health conditions. Always ask your healthcare professional before using any products with these drug names or if the word “NSAID” is printed on the product’s label. In general, acetaminophen, also called Tylenol, is safe for your kidneys at recommended doses - but check with your healthcare professional first to determine the cause of your pain and the best way to treat it.

If your healthcare professional says you have metabolic acidosis, increasing the amount of fruits and vegetables you eat everyday can help lower the level of acid in your blood. This can also help slow down your CKD progression (worsening).

Preparing for your appointment

Questions to ask

What are my eGFR and uACR numbers? What is my CKD stage?
How high is my level of risk for developing heart disease or a stroke? What can I do to lower my risk?
When should I have my eGFR and uACR tested again?
Am I at a healthy weight?
Is my blood pressure within the recommended goal range?
Do I have diabetes or prediabetes? If so, is my A1C within the recommended goal range?
Do I have albuminuria?
Are there any changes I should make to my diet?
Should I take any medication(s) to help lower my risk for CKD getting worse?

7.American Kidney Fund, 2024. Stages of kidney disease. [online] Available at: https://www.kidneyfund.org/all-about-kidneys/stages-kidney-disease [Accessed 24 June 2024].

Stages of kidney disease (CKD)
Learn what the stages of chronic kidney disease (CKD) refer to and how stages are based on the eGFR test. Get an overview of each of the five stages.
Medically reviewed by
AKF's Medical Advisory Committee
Last updated
June 6, 2024

What do the stages of chronic kidney disease (CKD) refer to?Stage 1 of CKD (eGFR of 90 or greater)Stage 2 of CKD (eGFR between 60 and 89)Stage 3 of CKD (eGFR between 30 and 59)Stage 4 of CKD (eGFR between 15 and 29)Stage 5 of CKD (eGFR less than 15)How can doctors tell my stage of CKD?
Chronic kidney disease (CKD) is divided into five stages. The stages are based on the eGFR test result and how well your kidneys work to filter waste and extra fluid out of your blood. As the stages go up, kidney disease gets worse and your kidneys work less well. At each stage, it is important to take steps to slow down the damage to your kidneys.

What do the stages of chronic kidney disease (CKD) refer to?
The five stages of CKD refer to how well your kidneys are working. Kidney disease can get worse in time. In the early stages (Stages 1–3), your kidneys are still able to filter waste out of your blood. In the later stages (Stages 4–5), your kidneys must work harder to filter your blood and may stop working altogether.

The goal at each stage of CKD is to take steps to slow down the damage to your kidneys and keep your kidneys working as long as possible.

Stage 1 of CKD (eGFR of 90 or greater)
Stage 1 CKD means you have a normal eGFR of 90 or greater and mild damage to your kidneys. Your kidneys are still working well, so you may not have any symptoms. You may have other signs of kidney damage, such as protein in your urine.

Learn more about stage 1 chronic kidney disease (CKD)

Chart of stage 1 kidney disease
Stage 2 of CKD (eGFR between 60 and 89)
Stage 2 CKD means your eGFR has gone down to between 60 and 89, and you have mild damage to your kidneys. Most of the time, your kidneys are still working well, so you may not have any symptoms. You may have other signs of kidney damage, such as protein in your urine or physical damage.

Learn more about stage 2 chronic kidney disease (CKD)

Chart of stage 2 kidney disease
Stage 3 of CKD (eGFR between 30 and 59)
Stage 3 CKD means you have an eGFR between 30 and 59 and mild to moderate damage to your kidneys. Your kidneys do not work as well as they should to filter waste and extra fluid out of your blood. This waste can build up in your body and begin to cause other health problems, such as high blood pressure and bone disease. You may begin to have symptoms, such as feeling weak and tired or swelling in your hands or feet.

Stage 3 CKD is split into two substages based on your eGFR:

Stage 3a means you have an eFGR between 45 and 59
Stage 3b means you have an eGFR between 30 and 44
With treatment and healthy life changes, many people in Stage 3 do not move to Stage 4 or Stage 5.
Learn more about stage 3 chronic kidney disease (CKD)

Chart of stage 3 kidney disease
Stage 4 of CKD (eGFR between 15 and 29)
Stage 4 CKD means you have an eGFR between 15 and 29 and moderate to severe damage to your kidneys. Your kidneys do not work as well as they should to filter waste out of your blood. This waste can build up in your body and cause other health problems, such as high blood pressure, bone disease and heart disease. You will likely have symptoms such as swelling of your hands and feet and pain in your lower back.

This is the last stage before kidney failure. It is important to have regular visits with a nephrologist (kidney doctor) to take steps to slow kidney damage and plan ahead for possible treatments for kidney failure.

Learn more about stage 4 chronic kidney disease (CKD)

Chart of stage 4 kidney disease
Stage 5 of CKD (eGFR less than 15)
Stage 5 CKD means you have an eGFR less than 15 and severe damage to your kidneys. Your kidneys are getting very close to failure or have already failed (stopped working). Because your kidneys have stopped working to filter waste out of your blood, waste products build up in your body, which can make you very sick and cause other health problems. When your kidneys fail, treatment options to survive include dialysis or a kidney transplant.

How can doctors tell my stage of CKD?
To find out your stage of CKD, doctors will do tests, such as:

eGFR tests (blood tests), which is a measure of how well your kidneys are working
Urine (pee) tests

8.Kidney Care UK, 2024. Chronic Kidney Disease (CKD). [online] Available at: https://www.kidneycareuk.org/about-kidney-health/conditions/ckd/ [Accessed 24 June 2024].

Chronic kidney disease (CKD)
Find out about chronic kidney disease (CKD): symptoms, diagnosis, treatment and sources of further information and support.

A diagnosis of chronic kidney disease (CKD) means that your kidneys do not work as well as they should.

The term 'chronic' means that it is a long-term condition. It does not mean that the condition is severe.

Most people with CKD have very mild symptoms and are managed by their GP. Only one in 50 people with CKD will ever need to receive dialysis treatment or have a kidney transplant.

This page gives more information about CKD, its treatments and what to expect. There is lots more information about CKD on our about kidney health page.

What_do_your_kidneys_do_1.original
What happens if I have CKD?
If you have CKD, your kidneys do not work as well as they should. Waste products start to build up in your body as your kidneys can't remove them properly. Damage to your kidneys' filter system lets blood and protein leak into your urine.

CKD Leaflet
How is CKD diagnosed?
CKD is usually diagnosed by blood and urine tests. You may have these tests as part of a routine check-up at your GP surgery or because you are at increased risk of developing CKD because you have other conditions such as diabetes, high blood pressure or heart disease, or a family history of kidney disease.

CKD is divided into five stages based on your glomerular filtration rate (GFR). Glomeruli are the network of tiny blood vessels inside the kidneys that separate out waste products and excess fluid from your blood. Your GFR shows how well your kidneys filter your blood, by indicating how much blood passes through the glomeruli every minute.

Getting an accurate measurement of your GFR is difficult, so your blood test results normally give an estimated filtration rate, or eGFR. It's calculated based on your age, sex, ethnicity and your creatinine blood level. Sometimes the calculation formula includes your weight and height, too. Your eGFR may be listed as a measurement of ml/min or as a percentage. So, an eGFR of 50ml/min means your kidneys are functioning at about 50%.

Most people with CKD stages one to three manage the condition themselves with support from their GP and do not need any specialist care from kidney doctors.

Stages of Chronic Kidney Disease	Description	eGFR levels
1	eGFR remains within a normal range, but other test results suggest signs of kidney damage	90 ml/min or more
2	Slightly reduced kidney function with other tests suggesting kidney damage	60-89 ml/min
3	Moderately reduced kidney function	30-59 ml/min
5	Very severe or end-stage kidney failure	Less than 15 ml

If your CKD progresses to stage four, you will be referred to a kidney doctor (nephrologist) at a hospital for further treatment.

CKD can get worse over time, although in the majority of people it will not progress to stage four. Only one in 50 people with CKD will need dialysis or a transplant.

In some cases kidney function can drop suddenly and then improve. This is known as acute kidney injury (AKI) and normally happens as a complication of another condition. AKI is usually temporary and often gets better without causing any long-term problems, in contrast to CKD which does not get better, but can be slowed or managed with treatment.

For more information see our page on AKI.

How common is CKD?
CKD is very common. It affects around one in ten people in the UK. The vast majority of people with CKD do not have any symptoms.

Who gets CKD?
CKD can affect people of all ages, including babies and children. It can run in families and is more common in people from Asian and Black backgrounds.

Fatigue
What causes CKD?
There are lots of causes of CKD including:

Diabetes
Heart disease
High blood pressure (hypertension)
Inflammation within the kidneys (glomerulonephritis)
Long-term, regular use of certain medicines including non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen and naproxen

Family history including inherited kidney conditions and rare diseases which account for one in ten cases of CKD in adults and almost all cases in children. Visit our page on rare kidney diseases for more information.
Your GP will try to find out what has caused your CKD to help decide the best treatment plan for you.

What are the symptoms of CKD?
Early stage CKD (one to three)

Most people do not have symptoms in the early stages of CKD, as even damaged kidneys can still work well enough to prevent any noticeable symptoms.

Early stage kidney disease is often diagnosed because of a blood or urine test for a different condition.

Late stages of CKD (four to five)

Symptoms include:

weight loss and poor appetite
swollen ankles, feet or hands
puffiness around the face, especially in the morning
shortness of breath
tiredness, low energy levels
blood in your urine
an increased need to wee, especially at night
difficulty sleeping
itchy skin
muscle cramps or weakness
feeling sick
headaches
Although many people do not have any symptoms, kidney damage can still affect your health. CKD can increase your chance of developing acute kidney injury, high blood pressure, heart disease or a stroke. Early diagnosis and regular monitoring is therefore very important as lifestyle changes and medical treatment can prevent CKD from getting worse.

What happens after I have been diagnosed with CKD?
If you have been diagnosed with CKD stages one to three you will have annual checks with your GP to monitor your condition and overall health. At each visit you will have your weight and blood pressure measured and a sample of your urine will be checked for signs of blood, protein or infection. You will have a blood test to measure your kidney function and check for signs of anaemia. Your GP will discuss any symptoms you may be having and whether any treatment is needed.

CKD leaflet - symptoms

How is CKD treated in stages one to three?
If you have mild CKD (stages one to three) and your kidney function is stable, you are unlikely to need any specific treatment and will be monitored by your GP. You may receive treatment for some of the symptoms of kidney disease, including anaemia and treatment to keep your bones healthy.

What can I do to stay healthy?
Eat a healthy balanced diet.
Take regular exercise. This can be a simple as increasing the amount of walking that you do each day. Doing any amount of exercise is better than doing none. Your GP can give you advice about how to exercise safely.
Give up smoking. Your GP can help you with this.
Give up or cut down on your alcohol intake.
Keep up to date with your vaccinations. When you have kidney disease, you are more likely to get other illnesses and take longer to recover. This can make your kidney function worse, so it is important to get treatment early. Ask your GP about having flu, pneumonia and Covid-19 vaccinations.
Check your blood pressure regularly. Your GP can teach you how to do this yourself at home.
Some over-the-counter and prescription medicines can make your kidney disease worse. Always tell your doctor and pharmacist that you have kidney disease and check that the medication you are given is safe to take.
Do not stop any medication without taking medical advice.
CKD leaflet
How is CKD treated in stages four to five?
More severe CKD (stages four to five) is likely to need specialist treatment such as dialysis, a kidney transplant or conservative care. Your kidney team will give you support and advice to help you understand your treatment options.

Some foods that are high in salt, potassium and phosphate can be harmful to your kidneys. Your kidney team will tell you if you need to lower the amount of potassium in your diet. A dietitian can give you specialist advice on how you can adapt your diet if needed.

Chronic kidney disease (CKD): Download or order Kidney Care UK's information leaflet
You can download our Chronic kidney disease (CKD) leaflet for free.

You can also order a printed copy of Kidney Care UK’s leaflet on this topic to be sent to you in the post.

PIF TICK logo
Publication date: 05/2024

9.National Institute of Diabetes and Digestive and Kidney Diseases, 2016. Managing Chronic Kidney Disease. [online] Available at:

https://www.niddk.nih.gov/health-information/kidney-disease/chronic-kidney-disease-ckd/managing [Accessed 24 October 2024].

Managing Chronic Kidney Disease
If you have chronic kidney disease (CKD), you can take steps to protect your kidneys from more damage.

The sooner you know you have kidney disease, the better. The steps you take to protect your kidneys from damage also may help prevent heart disease—and improve your health overall. Making these changes when you have no symptoms may be hard, but it's worthwhile.

Ten ways to manage kidney disease
Control your blood pressure
Meet your blood glucose goal if you have diabetes
Work with your health care team to monitor your kidney health
Take medicines as prescribed
Work with a dietitian to develop a meal plan
Make physical activity part of your routine
Aim for a healthy weight
Get enough sleep
Stop smoking

Find healthy ways to cope with stress and depression
Control your blood pressure
The most important step you can take to treat kidney disease is to control your blood pressure. High blood pressure can damage your kidneys. You can protect your kidneys by keeping your blood pressure at or less than the goal set by your health care provider. For most people, the blood pressure goal is less than 140/90 mm Hg.

Work with your health care provider to develop a plan to meet your blood pressure goals. Steps you can take to meet your blood pressure goals may include eating heart-healthy and low-sodium meals, quitting smoking, being active, getting enough sleep, and taking your medicines as prescribed.

The most important step you can take to treat kidney disease is to control your blood pressure.
Meet your blood glucose goal if you have diabetes
To reach your blood glucose goal, check your blood glucose level regularly. Use the results to guide decisions about food, physical activity, and medicines. Ask your health care provider how often you should check your blood glucose level.

Your health care provider will also test your A1C. The A1C is a blood test that measures your average blood glucose level over the past 3 months. This test is different from the blood glucose checks you do regularly. The higher your A1C number, the higher your blood glucose levels have been during the past 3 months. Stay close to your daily blood glucose numbers to help you meet your A1C goal.

The A1C goal for many people with diabetes is below 7 percent. Ask your health care provider what your goal should be. Reaching your goal numbers will help you protect your kidneys. Learn more about how to manage diabetes.

Work with your health care team to monitor your kidney health

The tests that health care providers use to test for kidney disease can also be used to track changes to kidney function and damage. Kidney disease tends to get worse over time. Each time you get checked, ask your provider how the test results compare to the last results. Your goals will be to

keep your GFR the same

keep your urine albumin the same or lower

Your health care provider will also check your blood pressure and, if you have diabetes, your A1C level, to make sure you are meeting your blood pressure and blood glucose goals.

Bring this document to your appointment to help keep track of your kidney test results (PDF, 262 KB) .

How can I prepare for visits with my health care provider?

The more you plan for your visits, the more you will be able to learn about your health and treatment options.

Make a list of questions

It's normal to have a lot of questions. Write down your questions as you think of them so that you can remember everything you want to ask when you see your health care provider. You may want to ask about what tests are being done, what test results mean, or the changes you need to make to your diet and medicines.

Sample questions to ask your provider for people with kidney disease

About your tests

What is my GFR? What does that mean?

Has my GFR changed since last time?

What is my urine albumin? What does it mean?

Has my urine albumin changed since the last time it was checked?

Is my kidney disease getting worse?

Is my blood pressure where it needs to be?

About treatment and self-care

What can I do to keep my disease from getting worse?

Do any of my medicines or doses need to be changed?

What time of day should I take each of my medicines?

Do I need to change what I eat?

Will you refer me to a dietitian for diet counseling?
When will I need to see a nephrologist (kidney specialist)?
Do I need to worry about dialysis or a kidney transplant?
What do I need to do to protect my veins?
About complications

What other health problems may I face because of my kidney disease?
Should I be looking for any symptoms? If so, what are they?
Bring a friend or relative with you for support
A trusted friend or family member can take notes, ask questions you may not have thought of, offer support, and help remember what the provider said during the visit. Talk ahead of time about what you want to get out of the visit and the role you would like your friend or relative to play.

Who is part of my health care team?
The following health care providers may be part of the health care team involved in your treatment:

Primary care provider. Your primary care provider (PCP)—doctor, nurse practitioner, or physician assistant—is the person you see for routine medical visits. Your PCP may monitor your kidney health and help you manage your diabetes and high blood pressure. A PCP also prescribes medicines and may refer you to specialists.

Nurse. A nurse may help with your treatment and teach you about monitoring and treating kidney disease, as well as managing your health conditions. Some nurses specialize in kidney disease.

Registered dietitian. A registered dietitian is a food and nutrition expert who helps people create a healthy eating plan when they have a health condition such as kidney disease. Dietitians can help you by creating an eating plan based on how your kidneys are doing. “Renal dietitians” often work in dialysis centers and are specially trained to work with people with kidney failure.

Diabetes educator. A diabetes educator teaches people with diabetes how to manage their disease and handle diabetes-related problems.

Pharmacist. A pharmacist educates you about your medicines and fills your prescriptions. An important job for the pharmacist is to review all of your medicines, including over-the-counter (OTC) medicines, and supplements, to avoid unsafe combinations and side effects.

Social worker. When you are close to needing dialysis, you may have a chance to meet with a social worker. A dialysis social worker helps people and their families deal with the life changes and costs that come with having kidney disease and kidney failure. A dialysis social worker also can help people with kidney failure apply for help to cover treatment costs.

Nephrologist. A nephrologist is a doctor who is a kidney specialist. Your PCP may refer you to a nephrologist if you have a complicated case of kidney disease, your kidney disease is quickly getting worse, or your kidney disease is advanced.

Take medicines as prescribed

Many people with CKD take medicines prescribed to lower blood pressure, control blood glucose, and lower cholesterol.

Two types of blood pressure medicines, ACE inhibitors and ARBs, may slow kidney disease and delay kidney failure, even in people who don't have high blood pressure. The names of these medicines end in –pril or –sartan.

Many people need to take two or more medicines for their blood pressure. You may also need to take a diuretic, sometimes called a water pill. The aim is to meet your blood pressure goal. These medicines may work better if you limit your salt intake.

Know that your medicines may change over time

Your health care provider may change your medicines as your kidney disease gets worse. Your kidneys don't filter as well as they did in the past, and this can cause an unsafe buildup of medicines in your blood. Some medicines can also harm your kidneys. As a result, your provider may tell you to

take a medicine less often or take a smaller dose
stop taking a medicine or switch to a different one

Your pharmacist and health care provider need to know about all the medicines you take, including OTC medicines, vitamins, and supplements.

A photo of a health care provider talking about medicine to an older patient.

Talk with your provider about all the medicines you take, including OTC medicines, vitamins, and supplements.

Be careful about the over-the-counter medicines you take

If you take OTC or prescription medicines for headaches, pain, fever, or colds, you may be taking nonsteroidal anti-inflammatory drugs (NSAIDs). NSAIDs include commonly used pain relievers and cold medicines that can damage your kidneys and lead to acute kidney injury, especially in those with kidney disease, diabetes, and high blood pressure.

Ibuprofen NIH external link and naproxen NIH external link are NSAIDs. NSAIDs are sold under many different brand names, so ask your pharmacist or health care provider if the medicines you take are safe to use.

You also can look for NSAIDs on Drug Facts labels like the one below:

An example of a Drug Facts label for a nonsteroidal anti-inflammatory drug (NSAID) that shows the active ingredient of ibuprofen and its purpose as a pain reliever.
Watch a video explaining how NSAIDs can harm your kidneys External link.

If you have been taking NSAIDs regularly to control chronic pain, you may want to ask your health care provider about other ways to treat pain, such as meditation NIH external link or other relaxation techniques. You can read more about pain management at the NIH National Center for Complementary and Integrative Health website NIH external link.

Tips for managing your medicines
The next time you pick up a prescription or buy an OTC medicine or supplement, ask your pharmacist how the product may

affect your kidneys
affect other medicines you take
Fill your prescriptions at only one pharmacy or pharmacy chain so your pharmacist can

keep track of your medicines and supplements
check for harmful interactions
Keep track of your medicines and supplements:

Keep an up-to-date list of your medicines and supplements in your wallet. Take your list with you, or bring all of your medicine bottles, to all health care visits.
A photo of a patient showing all his medicine bottles to a health care provider.
You may want to bring all of your medicine bottles with you to your health care visits.
Work with a dietitian to develop a meal plan
What you eat and drink can help you

protect your kidneys
reach your blood pressure and blood glucose goals
prevent or delay health problems caused by kidney disease
As your kidney disease gets worse, you may need to make more changes to what you eat and drink.

A dietitian who knows about kidney disease can work with you to create a meal plan that includes foods that are healthy for you and that you enjoy eating. Cooking and preparing your food from scratch can help you eat healthier.

Nutrition counseling from a registered dietitian to help meet your medical or health goals is called medical nutrition therapy (MNT). If you have diabetes or kidney disease and a referral from your primary care provider, your health insurance may cover MNT. If you qualify for Medicare, MNT is covered.

Your health care provider may be able to refer you to a dietitian. You can also find a registered dietitian External link online through the Academy of Nutrition and Dietetics. Work closely with your dietitian to learn to eat right for CKD.

Make physical activity part of your routine
Be active for 30 minutes or more on most days. Physical activity can help you reduce stress, manage your weight, and achieve your blood pressure and blood glucose goals. If you are not active now, ask your health care provider about the types and amounts of physical activity that are right for you.

View physical activity and weight-management resources to help you get and stay motivated.

Aim for a healthy weight
Being overweight makes your kidneys work harder and may damage your kidneys. The NIH Body Weight Planner is an online tool to help you tailor your calorie and physical activity plans to achieve and stay at a healthy weight.

Get enough sleep
Aim for 7 to 8 hours of sleep each night. Getting enough sleep is important to your overall physical and mental health and can help you meet your blood pressure and blood glucose goals. You can take steps to improve your sleep habits NIH external link.

Stop smoking
Cigarette smoking can make kidney damage worse. Quitting smoking may help you meet your blood pressure goals, which is good for your kidneys, and can lower your chances of having a heart attack or stroke. For tips on quitting, go to Smokefree.gov External link.

Find healthy ways to cope with stress and depression
Long-term stress can raise your blood pressure and your blood glucose and lead to depression. Some of the steps that you are taking to manage your kidney disease are also healthy ways to cope with stress. For example, physical activity and sleep help reduce stress. Listening to your favorite music, focusing on something calm or peaceful, or meditating may also help you. Learn more about healthy ways to cope with stress NIH external link.

Depression is common among people with a chronic, or long-term, illness NIH external link. Depression can make it harder to manage your kidney disease. Ask for help if you feel down. Seek help from a mental health professional. Talking with a support group, clergy member, friend, or family member who will listen to your feelings may help.

10.Centers for Disease Control, 2022. Physical activity for adults. [online] Available at: https://www.cdc.gov/physical-activity-basics/guidelines/adults.html?CDC_AAref_Val=https://www.cdc.gov/physicalactivity/basics/adults/index.html [Accessed 24 June 2024].

Physical Activity for Adults: An Overview

KEY POINTS

Physical activity is one of the most important things you can do for your health.

Adults need at least 150 minutes of moderate-intensity physical activity a week, such as 30 minutes a day, 5 days a week.

Adults also need 2 days of muscle-strengthening activity each week.

Recommendations for adults

Physical activity is anything that gets your body moving. Physical activity supports physical and mental health. The benefits of physical activity make it one of the most important things you can do for your health.

According to the current Physical Activity Guidelines for Americans
, adults need 150 minutes of moderate-intensity physical activity a week. This can also be 75 minutes of vigorous-intensity or an equivalent combination of moderate- and vigorous-intensity physical activity. In addition, adults need at least 2 days of muscle-strengthening activity each week.

We know 150 minutes of physical activity each week sounds like a lot, but you don't have to do it all at once. It could be 30 minutes a day, 5 days a week. You can spread your activity out during the week and break it up into smaller chunks of time. See steps for getting started.

Move more, sit less.

Some physical activity is better than none. Adults who sit less and do any amount of moderate- or vigorous-intensity physical activity gain some health benefits. Learn more about what counts for adults.

Recommended levels for health benefits

Example 1

Moderate-intensity aerobic activity (such as brisk walking) for 150 minutes every week (for example, 30 minutes a day, 5 days a week).

AND

Muscle-strengthening activities on 2 or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms).

Example 2

Vigorous-intensity aerobic activity (such as jogging or running) for 75 minutes (1 hour and 15 minutes) every week.

AND

Muscle-strengthening activities on 2 or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms).

Example 3

An equivalent mix of moderate- and vigorous-intensity aerobic activity on 2 or more days a week.

AND

Muscle-strengthening activities on 2 or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms).
For even greater health benefits
If you go beyond 150 minutes a week of moderate-intensity activity, or 75 minutes a week of vigorous-intensity activity or an equivalent combination, you'll gain even more health benefits.
Check out this age chart for a quick snapshot of the recommended amounts of weekly activity across age groups.

11. Organ Talks, 2021. Living life with chronic kidney disease. [online] Available at: https://www.organs-talk.com/ckd/living-life-with-ckd [Accessed 24 June 2024].

Living life with chronic kidney disease
'Thankfully, I had great support around me.'

How can my healthcare team help?
Your doctor or healthcare team can provide support and advice throughout your journey with chronic kidney disease.

If you have diabetes, regular appointments with your healthcare team can ensure that kidney disease is detected early through routine monitoring of your urine to check for abnormal protein or albumin levels.1

If you have high blood pressure, cardiovascular disease, any other conditions that might affect your kidneys, or a family history of kidney disease, then regular testing is recommended.2 Talk to a doctor if you experience signs or symptoms related to kidney disease.

Speaking to your doctor or healthcare team about testing can ensure that kidney disease is diagnosed and managed early, reducing your risk of the disease getting worse and increasing complications over time.

Your healthcare team can also:

Help
you to understand your treatment options.

you with tools and resources to support your lifestyle goals.
Provide
you with tools and resources to support your lifestyle goals.

the signs to look out for that may help you avoid further health challenges with interconnected organ systems, such as your heart or your pancreas.

Treatments for chronic kidney disease

Finding out that you have a long-term condition can come as a shock and you'll likely have a lot of questions, particularly around how your kidney disease will be managed. For the majority of people who have kidney disease, treatment can help to target symptoms and limit further damage to your kidneys.3

Types of treatment depend on the stage of kidney disease you have.

Lifestyle changes

For early stages, changes to your lifestyle such as healthy eating and more regular exercise, as well as medicine to help control whatever is causing the kidney damage, can help to minimize impact moving forward.3

Regular appointments

You will also be offered regular appointments to monitor for any changes in your kidney health.

Dialysis

For a small proportion of people with chronic kidney disease, their kidneys will eventually stop working. One of the ways this can be managed is dialysis, which is a method of removing waste products and excess water from the blood by a machine.

Kidney transplant

An alternative to dialysis for people with severely reduced kidney function is a kidney transplant, but this is very rare, with approximately two million individuals globally relying on dialysis or a transplant.4

Did you know:

Over two million individuals globally rely on kidney dialysis or a transplant.4

Each therapy has a different role in managing your condition, so be sure to take your treatments as directed by your doctor.

Staying on top of your chronic kidney disease

Speaking to your doctor about your symptoms can ensure that your kidney disease is managed in a way that is most appropriate for your situation.

Your doctor may have suggested that a change in lifestyle is necessary to help manage your kidney disease and help control your symptoms. While there are many benefits to a healthy diet and regular

exercise, changing your lifestyle can seem like an overwhelming task, but you don't have to make these changes all at once. Consider making lifestyle and healthcare related changes, such as:

Reduce your salt intake
to around one teaspoon a day.5

Reduce your weight
if you are overweight.6

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Stop smoking,
if you smoke.

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Lower your cholesterol levels
by adopting a more healthy diet e.g., think about steaming, boiling or grilling food, using vegetable oils as an alternative to frying with butter, ghee or lard.

Exercise each week
which could be as simple as: walking, if and when you can; taking the stairs instead of the elevator; parking the car a little further away; getting off the bus one stop earlier.7

Avoid anti-inflammatory medication
except when advised by your doctor and consult your doctor before starting any new medications to ensure that they could not potentially harm your kidneys.

Control your blood pressure
by asking your doctor what your blood pressure target should be.

Your emotional experience with chronic kidney disease
Being diagnosed and living with a long-term condition can leave you with a lot of emotions that you wouldn't normally feel. Feelings such as anger, denial, fear and despair, are not uncommon to experience following life-changing news, but it's important to remember there is help available if you need it.8

Ask your healthcare team what resources are available to you for psychological support. They may be able to direct you to online resources, support groups or counselling services.

You might find it helpful to speak to close friends or loved ones to help you to understand what you are experiencing. At the very least, sharing with someone close to you can help lighten the load.

Speaking to other people who are living with chronic kidney disease might also help. Online communities and support groups can be an amazing source of information, support and advice.

Everyone experiences periods of feeling low, but if this has been for longer than two weeks, then it's important to speak to your healthcare team so that they can help.

For further information, or if you just want to talk, there are various helplines available that can offer support.

Did you know:
There is a strong connection between chronic kidney disease and depression, due to psychosocial and biological changes associated with the condition and its treatment.9 For this reason, it's important to be aware of the symptoms of depression and to reach out for help if you need it.