Understanding

Chronic Kidney Disease and Cardiovascular Disease

A DISCUSSION GUIDE FOR PATIENTS AND CAREGIVERS

Whether you have just been diagnosed with kidney disease or have been living with it for some time, you may not know that it can increase your risk of developing cardiovascular disease (CVD), particularly heart disease. The reverse is also true — having heart disease can raise your risk of kidney disease. This happens because the heart and kidneys are closely connected: when one is affected, the other is often impacted too.

WHAT IS CARDIOVASCULAR DISEASE?

Cardiovascular disease (CVD) is a general term for conditions affecting the heart and blood vessels. It often develops when fatty deposits, called plaque, build up inside the arteries – a process known as **atherosclerosis**. This buildup can reduce or block blood flow, leading to serious health problems.

The main types of CVD include:

CORONARY HEART DISEASE
When the arteries that supply blood to the heart become narrowed or blocked, which can lead to a heart attack

CEREBROVASCULAR DISEASE
Affecting the blood vessels in the brain, which can lead to a stroke

PERIPHERAL ARTERY DISEASE
When blood flow to the limbs, especially the legs, is reduced

HEART FAILURE
When the heart does not pump blood as effectively as it should to meet the body's needs

WORLDWIDE, AROUND

850

million people

LIVE WITH CKD

CARDIOVASCULAR DISEASE IS THE *leading cause of death* **AMONG PEOPLE WITH CKD**

WHAT IS CHRONIC KIDNEY DISEASE?

Chronic kidney disease (CKD) is a condition in which the kidneys become progressively damaged over time. As this damage increases, the kidneys gradually lose their ability to work properly. The kidneys' small filters, called nephrons, are affected, making it harder for your body to remove waste and extra water from your blood.

CKD is usually progressive, meaning that as kidney damage worsens, kidney function declines and cannot be fully restored. However, early detection and appropriate treatment can help slow this process.

When your kidneys are not working well, waste products can build up in your body. CKD can also affect your blood pressure, red blood cells (which carry oxygen throughout your body), and the balance of important minerals such as phosphorus, sodium, and potassium. These changes can impact your overall health and wellbeing.

CAUSES OF CHRONIC KIDNEY DISEASE

Several factors can increase the risk of developing chronic kidney disease (CKD). The most common causes are:

DIABETES – when blood sugar levels are too high. Over time, high blood sugar can damage the kidneys and heart. About one in three people with diabetes in Europe may develop CKD if their condition is not well managed.

HIGH BLOOD PRESSURE – it puts extra strain on the kidneys, making it harder for them to filter waste. More than 80% of people with CKD also have high blood pressure.

HEART DISEASE – the heart supplies blood, oxygen, and nutrients to the kidneys. Problems like coronary artery disease, heart failure, or irregular heartbeats can sometimes lead to kidney damage.

Other, less common causes include: a family history of kidney disease, autoimmune conditions such as lupus, repeated kidney infections, and inherited conditions like polycystic kidney disease.

Shared risk factors of CKD and CVD

CKD and CVD are closely connected. Addressing these risk factors helps protect *both* organs.

- **CKD ITSELF INCREASES THE RISK OF CVD, AND VICE VERSA**
- **DIABETES**
- **HIGH BLOOD PRESSURE**
- **SMOKING**
- **OBESITY**
- **UNHEALTHY DIET**
- **CKD AND CVD FAMILY HISTORY**
- **PHYSICAL INACTIVITY**
- **HIGH CHOLESTEROL**

SIGNS AND SYMPTOMS

Kidney disease often develops quietly, and many people do not notice any symptoms until kidney function is significantly reduced. Moreover, because the heart and kidneys work closely together, some symptoms can overlap.

Symptoms of kidney disease

LOSS OF APPETITE

CHANGES IN URINATION – urinating more or less than usual

DECREASED MENTAL SHARPNESS OR CONCENTRATION

SLEEP PROBLEMS

DRY, ITCHY SKIN

MUSCLE CRAMPS

Symptoms shared by kidney disease and heart disease

CHEST PAIN OR DISCOMFORT

FATIGUE OR WEAKNESS

NAUSEA OR VOMITING

SHORTNESS OF BREATH, EITHER DURING PHYSICAL ACTIVITY OR WHEN LYING DOWN

SWELLING OF THE FEET AND ANKLES

HOW KIDNEY DISEASE AND HEART DISEASE ARE DIAGNOSED

Doctors use several tests to check how well your kidneys and heart are working.

Tests for Diagnosing Kidney Disease

- **BLOOD TESTS (CREATININE AND EGFR):** A blood test measures waste products such as creatinine. High creatinine can mean the kidneys are not filtering well.

  From this test, your doctor calculates your eGFR, which shows how much blood your kidneys filter each minute and helps determine the stage of CKD (from Stage 1: mild to Stage 5: kidney failure).

- **ULTRASOUND:** A painless imaging test that shows the size, shape, and structure of your kidneys to detect blockages, cysts, or abnormalities.

- **URINE TESTS:** The urine albumin to creatinine ratio (uACR) test detects the level of protein (albumin) in the urine. It helps detect early kidney damage and to classify it in three stages depending on the level of uACR, from normal to significant kidney damage.

- **MRI OR CT SCAN:** These provide more detailed images when further evaluation is needed.

- **KIDNEY BIOPSY:** In some cases, a small sample of kidney tissue is taken with a needle to identify the cause and extent of kidney damage.

If your doctor suspects heart problems as well, you may be referred to a cardiologist for further testing.

Tests for Diagnosing Heart Disease

Depending on your symptoms and risk factors, your doctor may order:

- **BLOOD PRESSURE CHECK**
- **LISTENING TO THE HEART WITH A STETHOSCOPE:** Helps detect abnormal rhythms or valve problems.
- **BLOOD TESTS:** Measure cholesterol and other markers of heart muscle damage.
- **ELECTROCARDIOGRAM (ECG):** A quick, painless test that records your heart's electrical activity.
- **ECHOCARDIOGRAM (HEART ULTRASOUND):** Shows how well your heart pumps and how your valves function.
- **STRESS TEST:** Measures how your heart performs during exercise such as walking on a treadmill.
- **BNP TEST (B-TYPE NATRIURETIC PEPTIDE):** BNP is a hormone that helps reduce the workload of the heart. High BNP levels in the blood may indicate heart failure.
- **OTHER IMAGING TESTS:** For example, an ultrasound of the neck arteries may be used to check for blockages that increase stroke risk.

The Powerful Connection Between Kidneys and Heart

YOUR HEART AND KIDNEYS WORK AS A TEAM — WHEN ONE STRUGGLES, THE OTHER FEELS THE IMPACT.

WHEN THE KIDNEYS CANNOT REMOVE WASTE AND EXTRA FLUID, THE HEART MUST WORK HARDER — RAISING THE RISK OF HEART ATTACK, HEART FAILURE, AND STROKE. AND WHEN THE HEART IS WEAKENED, THE KIDNEYS MAY ALSO BE DAMAGED – TAKING CARE OF ONE PROTECTS BOTH.

TREATMENT OF CKD AND CVD

Although **chronic kidney disease** and **cardiovascular disease** are different conditions, they are closely connected and often share the same risk factors. Treating one can help improve the other.

Treating the Underlying Causes

- **DIABETES, HIGH BLOOD PRESSURE, AND HIGH CHOLESTEROL** can damage both the heart and the kidneys.

Some medications for these conditions help slow down CKD and reduces the risk of heart attacks, stroke, and heart failure.

Managing Related Health Problems

- **ANAEMIA, FLUID BALANCE PROBLEMS, AND BONE–MINERAL DISORDERS** may occur with CKD and require specific treatments.
- **HEART RHYTHM DISORDERS, HEART FAILURE SYMPTOMS** or **VASCULAR PROBLEMS** may accompany CVD and need tailored therapy.

Addressing these complications helps stabilise overall health and prevents one disease from worsening the other.

Lifestyle Changes

These changes support both kidney and heart health and help slow disease progression:

- **HEALTHY DIET:** Low in salt, sugar, and unhealthy fats.
- **REGULAR PHYSICAL ACTIVITY:** Adapted to ability and symptoms.
- **STOPPING SMOKING:** Reduces blood vessel damage and improves oxygen delivery.
- **MAINTAINING A HEALTHY WEIGHT:** Helps control blood pressure and blood sugar.

Devices and other procedures

- For CVD, devices like **PACEMAKERS** or **IMPLANTABLE DEFIBRILLATORS** may help the heart. For severe heart failure that does not respond to medication or devices, a **HEART TRANSPLANT** may be needed.
- In CKD, **DIALYSIS** or a **KIDNEY TRANSPLANT** may be needed when the kidneys can no longer filter waste.

QUESTIONS TO ASK YOUR DOCTOR

- What caused my CKD and/or CVD?
- What stage of CKD am I in?
- Are there medications that are effective for managing both my kidney and cardiovascular disease? What are their risks and benefits?
- What changes to my diet or physical activity should I make to support my heart and kidneys?
- If my kidneys are not removing water properly, should my fluid intake be adjusted?
- What signs or symptoms should prompt me to seek emergency help?
- Will I eventually need dialysis?
- How can I connect with other patients for support and advice on living with CKD and CVD?

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