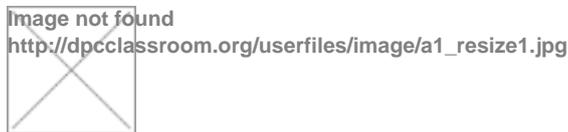


## The Heart of the Matter

This class will teach you about cardiovascular disease more commonly known as heart disease. To navigate the class use the left and right arrows below, or the outline and related chapters to the right to jump directly to your desired material.

## Chronic Kidney Disease and Cardiovascular Disease



Cardiovascular Disease (CVD) means that there are problems with the heart and/or blood vessels. Most people are not aware that kidney disease raises the risk for CVD. This is very important because conditions like diabetes and high blood pressure are known to be leading causes of CVD. These conditions damage blood vessels and organs like the heart, leading to CVD. Because of this connection, CVD is common in people with Chronic Kidney Disease (CKD) and heart disease is the leading cause of death for people with CKD.

## Bones, Chronic Kidney Disease, and Cardiovascular Disease

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- One problem that can happen early in Chronic Kidney Disease (CKD) is called CKD-MBD (Chronic Kidney Disease-Mineral and Bone Disorder). This condition is impacted by how the body balances two minerals, calcium and phosphorus.
- CKD causes increased phosphorus in the blood, triggering 4 small glands in the neck, called the parathyroid glands, to produce parathyroid hormone (PTH).
- Due to the increase in phosphorus, PTH tells the body to move calcium out of the bones and into the blood stream to help balance the amount of phosphorus and calcium in the blood.
- If PTH production stays high the body will keep taking calcium out of the bones, causing them to become weak and brittle. Vitamin D hormone produced by the kidneys helps to lower PTH and help balance calcium. Decreasing the amount of phosphorus in the food you eat may also be important. Talk to your healthcare team about the need for prescription vitamin D and whether you need to be on a low phosphorus diet.
- Calcium that was pulled out of the bones will settle into bone-like deposits. These deposits can "harden" blood vessels and damage organs like the heart, causing CVD.

## Risk Factors for Cardiovascular Disease

**High blood pressure** is the second leading cause of Chronic Kidney Disease (CKD) because it can damage blood vessel walls over time. This can decrease the amount of oxygen that can get to organs like the kidneys and heart. The high pressure can also damage the tiny filters inside the kidneys which clean our blood. If a person with CKD develops high blood pressure it is more likely that their kidney disease will get worse and they will have heart problems - Cardiovascular Disease (CVD).

**Anemia** occurs when there are not enough red blood cells (RBCs) to carry oxygen to organs and cells. Healthy kidneys produce a hormone called erythropoietin (EPO) which helps to produce red blood cells. Damaged kidneys make less EPO so people with CKD produce fewer red blood cells and less oxygen is carried. This causes the heart to work harder to circulate the oxygen needed by the other organs and cells which can cause CVD.

**Abnormal calcium and phosphorus levels can lead to CKD-MBD** (chronic kidney disease mineral and bone disorder). Early in CKD there can be changes in how the body balances calcium and phosphorus. Extra phosphorus and calcium may be removed from the bones and be deposited in blood vessels and organs. These bone-like deposits (calcification) damage blood vessels and organs like the heart, leading to CVD.

**Fluid overload**

is caused by kidneys that are no longer able to remove all of the extra fluids from our bodies. Because there is more fluid to pump, the heart has to work harder and faster. Over time, this increased work load and higher blood pressure weakens the heart and damages blood vessels.

## What can you do?

### The Bottom Line

There are some risk factors we cannot control such as age, gender, ethnicity, having Chronic Kidney Disease (CKD) or even our family history, but there are many things **you can do** to decrease your risk for Cardiovascular Disease (CVD), such as diet and exercise.

### Lowering Your Risk

- Practice healthy eating habits. A kidney friendly diet is also heart healthy. Talk to your dietitian for more information about foods that are high in lean protein and low in phosphorus, fat, salt and sugars. Find out how much fluid you should drink every day and stick to it.
- If your kidneys are not functioning properly, it is very important to limit phosphorus in your foods. Many foods contain phosphorus so talk to your dietitian about menu ideas.
- Certain medicines may be prescribed by your doctor called phosphate binders. Take these with food to help "bind" excess phosphorus from your foods. Examples of phosphate binders include Renvela®, Fosrenol®, and PhosLo®.
- Vitamin D hormone replacements such as Hectorol®, Zemplar® and Rocaltrol® may be prescribed to decrease PTH and provide vitamin D to help your body absorb calcium into the bones.
- Blood pressure medicine will most likely be prescribed by your doctor to protect both your kidneys and heart.
- Controlling conditions such as diabetes, high blood pressure and cholesterol will help to protect your kidneys and heart.
- Work with your doctor and dietitian to keep blood glucose and blood pressure controlled to decrease the risk of blood vessel and heart damage.
- Talk to your doctor and dietitian about diet and medicines to keep cholesterol and triglyceride levels within normal limits to prevent plaque buildup.
- Don't forget to ask about what kinds of exercise you can safely enjoy. Even mild like walking can help to lower blood pressure.

## Choose Another Class

Congratulations! You've reached the end of the Heart of the Matter class. Please select another class from the list below to continue your education.

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