

# Cardiorenal syndrome

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## What is it

“Cardio” (pertained ing to the heart), and “renal” (pertaining to the kidneys) is a specific clinical entity where decline is heart's function leads to a decline in kidney function (or vice versa).

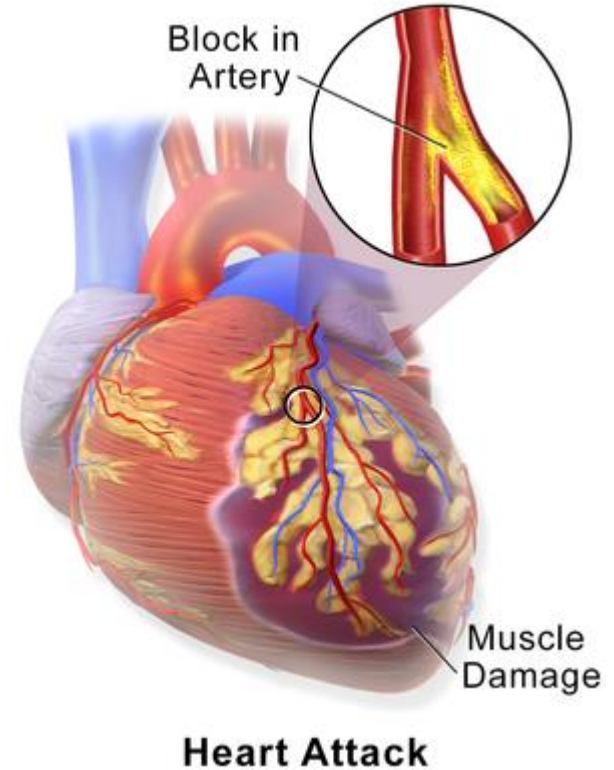


## To elaborate

This syndrome is a two way street. It's not just the heart that could drag down the kidneys. Actually, kidney disease, both acute (short duration, sudden onset) or chronic (long-standing, slow-onset chronic disease) could also cause problems with the heart's function. Finally, an independent secondary entity (like diabetes) could hurt both the kidneys and heart, leading to a problem with both organs functioning.

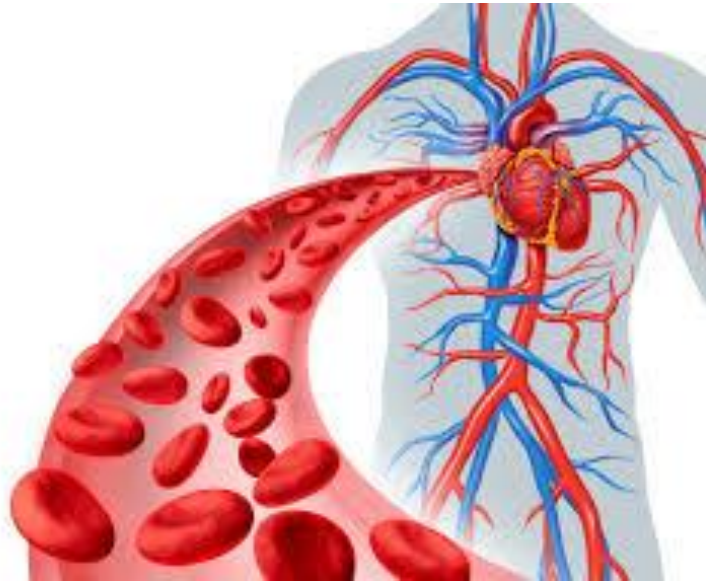
## How does it work?

Cardiorenal syndrome can start by a sudden worsening of the heart (like a heart attack) hurts the kidneys. But that might not always be the case because in long standing chronic congestive heart failure can also lead to kidney issues.



# How it develops

It begins when the body tries to maintain good blood circulation, while this can be beneficial it can lead to the worsening of other organs.



# Diagnosis

For the diagnosis there are several different ways to test for the disease. Some of those ways are...

- For the kidneys: Blood tests for creatinine/GFR and urine tests for blood, protein, etc. The sodium level in the urine might be helpful (but needs to be interpreted carefully in patients on diuretics). Imaging tests like ultrasound are often done as well.
- For the heart: Blood tests for troponin, BNP, etc. Other investigations like EKG, echocardiogram, etc.

## Type one (acute cardiorenal syndrome)

- Acute worsening of heart function leading to kidney injury and/or dysfunction.
  
- Acute heart failure or acute coronary syndrome or cardiogenic shock

## Type 2 (chronic cardiorenal syndrome)

- Chronic abnormal in heart function leading to kidney injury or dysfunction.
- Chronic heart disease (systolic and/or diastolic dysfunction, chronic abnormalities in cardiac function, cardiomyopathy)



## Type 3 (acute renocardiac syndrome)

- Acute worsening of kidney function leading to heart injury and/or dysfunction.
  
- Acute kidney injury

## Type 4 (chronic renocardiac syndrome)

- Chronic kidney disease leading to heart injury, disease and/or dysfunction.
  
- CKD

## Type 5 (secondary cardiorenal syndrome)

- Systemic condition causing cardiac and renal dysfunction
- Systemic disease (septic shock, diabetes, metS, NAFLD, amyloidosis, vasculitis etc.)

# Treatment strategies

The way to treat cardiorenal syndrome is still in active research. People who normally have the syndrome are typically in and out of the hospital a lot. Therefore the risk of death is increased. Here are some effective way to help treat the syndrome.

- Diuretics
- ACE/ARB
- Inotropes
- LVAD
- Kidney and heart transplant

