

# Diabetic cardiomyopathy

Written by Danielle Nicholson

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Diabetes mellitus can damage the cardiac structure and impair the function of the heart in the absence of coronary artery disease and hypertension. This phenomenon called diabetic cardiomyopathy is extremely prevalent. In one study, 52% of people with type 2 diabetes had some degree of diabetic cardiomyopathy. Specific changes in the structure and function of the heart that take place in people with diabetes have been detected by medical doctors.

*Hallmarks of diabetic cardiomyopathy include:*

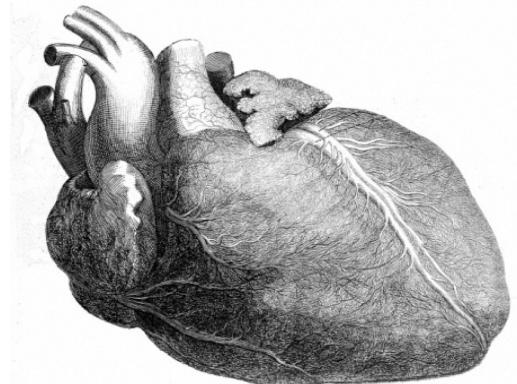
- Cardiac inflammation*- a protective response resulting in a barrier between healthy and injured areas
- Cardiac oxidative stress*- damage caused by imbalances in oxidants and anti-oxidants
- Interstitial and perivascular fibrosis*- excessive build-up of connective tissue
- Cardiac apoptosis*- cardiac cell death
- Intramycocardial microangiopathy*- small vessel disease within the heart
- Endothelial dysfunction*- irregular dilation and constriction of inner layer of the blood vessels

Several lines of evidence indicate that *left ventricular diastolic dysfunction* represents the earliest preclinical manifestation of diabetic cardiomyopathy. This means that between contractions, the left ventricle of the heart has difficulties to relax or cannot fully relax. People with type 2 diabetes are more prone to having left ventricular hypertrophy, an enlarged left ventricle.

People with type 1 and type 2 diabetes are more likely to be at risk from heart attacks, strokes and high blood pressure. Other vascular problems, such as poor circulation to the legs and feet, are also more likely to affect diabetes patients.

Like diabetes itself, the symptoms of cardiovascular disease may go undetected for years.

Serious cardiovascular disease may develop in diabetes patients before the age of 30.



Wellcome Images

**Did you know?**

In cardiomyopathy, the heart becomes thick, or rigid.

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Treatments for diabetic cardiomyopathy include lifestyle changes, medicines, surgery, and implanted devices to correct arrhythmias. These treatments may control symptoms, reduce complications and prevent the disease from getting worse.

If cardiomyopathy progresses, the heart muscle weakens. It becomes less able to pump blood through the body and maintain its normal electrical rhythm. This can lead to heart failure or irregular heartbeats called arrhythmias. Additionally, heart failure can cause fluid to accumulate in the lungs, ankles, feet, legs or abdomen.

The weakening of the heart also can cause other complications, such as heart valve problems.

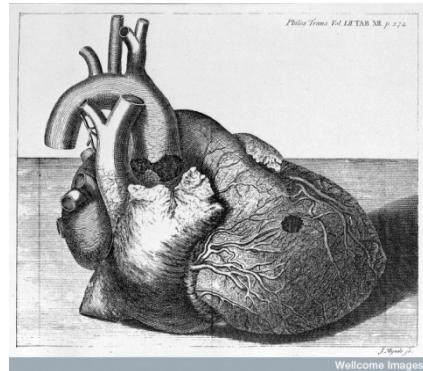
## How is diabetic heart disease diagnosed?

A doctor will diagnose diabetic heart disease based on signs and symptoms, medical and family histories, a physical exam, and the results from tests and procedures. These may include the analysis of cardiac biopsies for markers of inflammation and fibrosis, coronary angiography, echocardiography, blood pressure measurement, blood tests, a chest x ray, a stress test, an electrocardiogram (EKG) or a urinalysis.

Blood tests check levels of fats, cholesterol, sugar, proteins, and a hormone called BNP (brain natriuretic peptide). The heart produces BNP; the level of BNP rises during heart failure.

An EKG detects and records how fast the heart is beating and its rhythm (steady or irregular). An EKG also records the strength and timing of electrical signals as they pass through the heart.

Stress testing gives the doctor information about how the heart works during physical stress.



### Did you know?

- Cardiomyopathy can be inherited or acquired.
- Cardiomyopathy can affect people of all ages.

Funded by the European Commission's FP7, REDDSTAR is a three year, 10 partner project that will comprehensively examine if stromal stem cells derived from bone marrow can safely control blood glucose levels while also alleviate damage caused by six diabetic complications.

[www.REDDSTAR.eu](http://www.REDDSTAR.eu)