

### How is systolic heart failure diagnosed?

It is difficult to tell the difference between systolic and [diastolic heart failure](#) based on medical history and a physical examination alone. The main difference between these two forms of heart failure is that a patient with systolic heart failure pumps a less-than-normal amount of blood out of the heart with each heartbeat. This is measured by

[ejection fraction](#)

, the percentage of blood pumped—or "ejected"—out of a filled pumping chamber (ventricle) during each heartbeat.

To measure your ejection fraction, your doctor will order an [echocardiogram](#) to check the size of your heart's left pumping chamber and its pumping (systolic) and filling (diastolic) ability. A normal ejection fraction is 50% or higher, meaning 50% or more of the total blood in the main pumping chamber (left ventricle) is pumped out during each heartbeat.

<sup>23</sup>

Women tend to have a higher ejection fraction than men, even when they have systolic heart failure.

<sup>4, 12</sup>

The reason for this is not clear.

Ejection fraction can also be measured with a [nuclear ventriculogram](#) or [cardiac MRI](#), but Doppler echocardiography is the primary diagnostic test used to measure ejection fraction. See [Heart Failure Tests & Diagnosis](#) for more information.

### How is systolic heart failure treated?

The goal of treating systolic heart failure is to alleviate symptoms, slow down the progression of the disease, and improve the quality of life. Treating certain conditions that cause heart failure may stabilize the heart, and, in some cases, it can return to normal strength and size. Treatment options include medications, devices, and surgery.

The treatment of systolic heart failure usually includes a combination of 3 types of drugs: a [diuretic](#), an [angiotensin-converting enzyme \(ACE\) inhibitor](#) or [angiotensin receptor blocker \(ARB\)](#), and a [beta-blocker](#).

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A diuretic is used to relieve and control fluid retention in the lungs and limbs. An ACE inhibitor lowers blood pressure and improves symptoms, clinical status, and overall sense of well-being; it also reduces the risk of dying and hospitalization. Patients who can't take ACE inhibitors due to side effects such as coughing may be given an ARB. A beta-blocker slows your heart rate and lowers your blood pressure, and can slow down the progression of heart failure and improve survival. A beta-blocker should be given as soon as systolic dysfunction is diagnosed because of how well it can slow the progression of the disease.

It remains unclear if ACE inhibitors benefit women to the same extent as they do men, although some studies have found a trend towards a reduced risk of death and need for hospitalization in women with systolic heart failure taking ACE inhibitors.<sup>25-27</sup> Because of the strong benefits of ACE inhibitors seen in studies involving mostly men, no study of heart failure treatment is allowed to be performed without these drugs.

Doctors may also consider adding [digoxin](#) (digitalis drug) to patients with persistent or severe symptoms who haven't responded to treatment with a diuretic, an ACE inhibitor (or ARB), and a beta-blocker.<sup>24</sup> Digoxin helps your heart pump blood more effectively. It can make you feel better, but it provides no survival benefit and needs to be monitored carefully.

Other drugs that can be added to standard heart failure medications for select patients are [hydralazine and isosorbide dinitrate](#), which lower blood pressure and reduce the strain on the heart. In African Americans, who often don't respond as well to ACE inhibitors as whites do, adding hydralazine and isosorbide dinitrate to the standard treatment can improve survival.

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Hydralazine and isosorbide dinitrate may also be considered as a substitute for ACE inhibitors

in heart failure patients who can't tolerate ACE inhibitors because of kidney failure.

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Some heart failure patients may require surgery (such as [coronary artery bypass graft surgery](#) or heart valve repair) to improve damage to the heart or implantable devices (such as a [pacemaker](#)

and a

[defibrillator](#)

) to control irregular heart rhythms. As a last resort, people with severe heart failure who do not respond to standard treatment may be eligible for a

[heart transplant](#)

See [Overview of Systolic Heart Failure Treatment](#) for more information.

[Next: Prognosis in Systolic vs. Diastolic Heart Failure](#)

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