



Ejection Fraction

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What is ejection fraction?

What is Ejection Fraction and it's Link to Heart Failure?

Ejection fraction is a test that determines how well your heart pumps with each beat.

Left ventricular ejection fraction (LVEF) is the measurement of how much blood is being pumped out of the left ventricle of the heart (the main pumping chamber) with each contraction.

Right ventricular ejection fraction (RVEF) is the measurement of how much blood is being pumped out of the right side of the heart to the lungs for oxygen.

In most cases, the term “ejection fraction” refers to left ventricular ejection fraction.

What do the numbers mean?

Ejection fraction is usually expressed as a percentage. A normal heart pumps a little more than half the heart’s blood volume with each beat. (1)

A normal LVEF ranges from 55-70%. A LVEF of 65, for example, means that 65% of the total amount of blood in the left ventricle is pumped out with each heartbeat.

The LVEF may be lower when the heart muscle has become damaged due to a heart attack, heart muscle disease (cardiomyopathy), or other causes.

An EF of less than 40% may confirm a diagnosis of heart failure. Someone with diastolic failure can have a normal EF.

An EF of less than 35% increases the risk of life-threatening irregular heartbeats that can cause sudden cardiac arrest (loss of heart function) and sudden cardiac death. An implantable cardioverter defibrillator (ICD) may be recommended for these patients.

Your EF can go up and down, based on your heart condition and the therapies that have been prescribed.

Ejection Fraction Measurement What it Means

55-70%	Normal
40-55%	Below Normal
Less than 40%	May confirm diagnosis of heart failure
<35%	Patient may be at risk of life-threatening irregular heartbeats

How is EF measured?

EF can be measured in your doctor’s office during tests such as:

- Ultrasound of the heart (echocardiography) – used most often
- Cardiac catheterization
- Magnetic resonance imaging (MRI) scan of the heart
- Nuclear medicine scan (multiple gated acquisition or MUGA) of the heart; also called a nuclear stress test

How the Heart Works

A healthy heart beats about 60 to 80 times per minute to pump blood throughout the body. The right and left sides of the heart work together. Blood that is low in oxygen first enters the right upper chamber (right atrium) of the heart. The blood flows from the right atrium to the lower chamber (right ventricle) through the open tricuspid valve. Blood passes through a valve before leaving each chamber of the heart. There are four valves in your heart; valves make sure blood flows in only one direction through your heart. The blood then travels through the pulmonary artery to the lungs where oxygen is added.

Oxygen-rich blood then returns to the left side of the heart. The blood flows from the left upper chamber (left atrium) to the lower chamber (left ventricle) through the open mitral valve. From the left ventricle, the blood is pumped into a network of arteries (blood vessels) that carry the blood throughout the body. Learn more about blood flow through the heart <LINK: <http://my.clevelandclinic.org/heart/heartworks/bloodflow.aspx>> .

- Computerized tomography (CT) scan of the heart

What is heart failure?

Heart failure means:

- The muscles of the heart are weaker than normal or the lower chambers of the heart are not able to relax and fill with blood as they normally do
- Less blood is pumped out of the heart to organs and tissues in the body
- Pressure in the heart increases

Heart failure **does not** mean that your heart has stopped working.

When the heart cannot pump enough oxygen and nutrients to meet the body's needs, it tries to adapt. The chambers of the heart stretch to hold more blood to pump through the body with each heartbeat. Hormones are released into the bloodstream to increase the heart's pumping power and increase blood flow into the heart chambers. These changes provide temporary relief, but over time, the heart muscle walls continue to weaken and/or stiffen.

There are two types of heart failure:

Systolic left ventricular dysfunction (or systolic heart failure) occurs when the left ventricle heart muscle doesn't contract with enough force, so less oxygen-rich blood is pumped throughout the body.

Heart failure with preserved left ventricular function (diastolic heart failure) occurs when the heart contracts normally, but the ventricles do not relax properly or are stiff and less blood enters the heart during normal filling. In this case, the ejection fraction may be normal.

Resources

- Ejection Fraction Heart Failure Measurement <LINK: http://www.heart.org/HEARTORG/Conditions/HeartFailure/SymptomsDiagnosisofHeartFailure/Ejection-Fraction-Heart-Failure-Measurement_UCM_306339_Article.jsp >
- Heart.org <LINK: http://www.heart.org/HEARTORG/Conditions/HeartFailure/SymptomsDiagnosisofHeartFailure/Ejection-Fraction-Heart-Failure-Measurement_UCM_306339_Article.jsp >
- ICD Therapy Assessment Tool <LINK: <http://my.clevelandclinic.org/heart/implantable-cardioverter-defibrillator-icd-tool.aspx> >

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Talk to a Nurse: Mon. - Fri., 8:30 a.m. - 4 p.m. (ET)

Call a Heart & Vascular Nurse locally **216.445.9288** or toll-free **866.289.6911**.

- Chat Online
- Submit an Online Message (24/7) <LINK: <https://my.clevelandclinic.org/webcontact/webmail.aspx> >

Schedule an Appointment

Toll-free **800.659.7822**

- Submit an Online Request <LINK: <https://my.clevelandclinic.org/webcontact/webappointment.aspx> >

Why It's Important to Know Your EF

If you have a heart condition, it is important for you and your doctor to know your EF.

Your EF can help your doctor determine the best course of treatment for you and the effectiveness of the therapies that have been prescribed.

You should have your EF measured initially when you are first diagnosed with a heart condition, and again as needed, based on changes in your condition. Ask your doctor how often you should have your EF checked.