

# Heart Failure in Children and Teens

## Quick Facts

- Heart failure is a condition where the heart is not working as well as it should.
- In children, heart failure has different causes than in adults.
- Treatment can include medications, nutritional supplements and surgery.



The term [heart failure](#) describes a heart that can't pump blood properly. It does not mean that the heart has stopped working. It means the heart isn't working as well as it should.

Heart failure happens in adults due to effects of:

- Smoking
- High blood pressure
- Diabetes
- Coronary artery disease

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## Heart Failure

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# The healthy heart

The heart is a pump. An internal electrical system starts its pumping function. A healthy heart is divided into four parts:

- Right side (top and bottom)
- Left side (top and bottom)

These compartments help blood circulate. Blood carries oxygen to the body by moving it through the heart and lungs in a specific order.

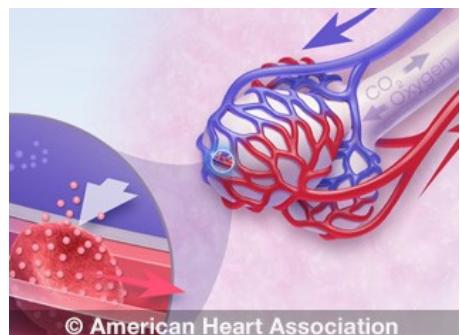
A wall called a septum separates the two sides of the heart. This keeps oxygen-rich blood and oxygen-poor blood from mixing.

Valves in the heart open and close to keep blood flowing in the right direction to move:

- Oxygen-poor blood to the lungs
- Oxygen-rich blood to the rest of the body

Valves do this by preventing the backward flow of blood inside the heart.

For a child to grow and develop, the heart needs to maintain normal pumping function. This provides effective blood flow throughout the body.



[Watch an animation of blood flow in the heart.](#)

## What causes heart failure in children?

Most of the time, children have heart failure because they were born with a heart problem called a [congenital heart defect](#). Sometimes, other health problems can cause children to develop heart defects or hurt a child's heart. This can cause heart failure.

## Types of heart failure in children

### Over-circulation failure

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These defects include:

- A hole between the right or left upper or lower chambers
- Incorrectly formed heart chambers
- Defective major arteries
- Leaky or narrowed heart valves

## Pump failure

Some health problems can cause a child's heart to develop incorrectly or become damaged. This causes the heart to pump ineffectively, called pump failure.

Pump failure can be caused by:

- A viral or bacterial infection that damages the heart muscle
- Decrease in the blood supply to the heart (rare in children)
- Some medications to treat other conditions, such as cancer
- Irregular heartbeats, which happen when the heart's electrical system is either abnormal from birth or damaged by infection, causing the heart to beat too slow or too fast
- Heart valve defects in which a valve does not open or close properly, causing pressure to back up inside the chambers
- Other health problems, including:
  - Muscular dystrophy
  - Kawasaki disease
  - Specific genetic disorders

## Signs and symptoms

### Infants

In infants, signs and symptoms of heart failure include:

- Breathing trouble
- Poor feeding
- Poor growth
- Excessive sweating
- Swelling of the feet, ankles, lower legs, belly, face or neck

Often, an infant with heart failure will:

- Take longer to feed or become uninterested in feeding after a short time
- Have a rapid heartbeat that can be felt through the chest wall when the infant is sleeping or resting
- Not gain weight at a healthy rate
- Have rapid or labored breathing

### Children and Teens

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- Have swelling in the feet, ankles or stomach
- Gain weight
- Have shortness of breath

# Diagnosis

## Examination

If heart failure is suspected, your child's health care professional will check them for:

- Rapid or labored breathing
- Swelling in their feet, ankles and stomach
- Neck veins that stick out
- Crackles in your child's lungs from fluid buildup
- Irregular heartbeat or heart sounds

They might also take a blood sample from your child to send to a lab to look for signs of heart failure.

## Imaging

If your child's health care professional thinks your child might have heart failure, they will ask for imaging to look at your child's heart.

Imaging can include:

- [Electrocardiogram](#) (EKG) to evaluate the heart rhythm
- Ultrasound ([echocardiogram](#)) to look at heart structure and function
- Chest X-ray to see if the heart is enlarged

Your child might need to see a pediatric heart specialist for imaging or more tests. Imaging is often done in the pediatrician's office and is not painful. Based on your child's age and ability to cooperate, they might need light sedation for the clearest results.

## Testing

Sometimes, a heart catheterization is needed. In this test, a small plastic tube, called a catheter, is placed inside the heart through a blood vessel in your child's leg or arm. The catheter measures pressures and oxygen levels in different parts of the heart. This test is done in a special room, so a short hospital stay is often needed.

# How is pediatric heart failure treated?

## Treating over-circulation failure

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Your child's health care professional might suggest nutritional supplements to help them get enough calories.

Sometimes, the defect causing your child's heart failure can't be managed with only medications and nutritional changes. Surgery is often needed to fix the defect. If heart surgery is required, you and your child's health care professional can talk about the types of surgery or other treatments available.

## Treating pump failure

If your child's heart failure is caused by pump failure, diuretics and afterload reducers may be used. Sometimes, other blood pressure medications can help the heart pump better. A hospital stay might be needed. At times, surgery might also be required, such as replacing a damaged heart valve.

Pump failure caused by a heartbeat that is too slow often needs a [pacemaker](#). Pacemakers are implanted medical devices that help the heart keep a normal heart rate. The small, battery-operated devices are tiny computers placed under your child's skin with a small wire connected to the heart. This requires a surgery.

If the pump failure is caused by a heartbeat that is too fast, your child might need medications. Or, a heart catheterization procedure called radiofrequency ablation might be recommended to fix the heart rhythm. This procedure applies short bursts of radio waves to the area of heart muscle causing the rapid heartbeat.

Rarely, if the heart muscle is permanently damaged, medications might not help and heart function could get worse. A special pacemaker, [mechanical pump](#) (LVAD) or an extracorporeal membrane oxygenator (ECMO) might be needed to help the heart pump temporarily. If heart muscle function keeps getting worse with treatment, a heart transplant may be needed.

## Hope for the future

Heart failure in children is very rare and not always hopeless. Many causes can be fixed or managed. It's important that parents and family members understand the causes and treatments of heart failure in children.

With proper medical care and newer techniques and medications, most children with heart failure can grow up and lead active lives.

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