CONDITION

Heart failure in children

Heart failure in children means the heart cannot pump or fill well enough to meet the body's needs.

WHAT IT IS
Inability of the heart to meet the body's needs

BODY SYSTEM
Heart and circulation

MAIN SYMPTOMS
Fast breathing, poor feeding, tiredness, swelling

WHAT CAUSES IT
Heart defects, muscle disease, infection, or abnormal rhythms

HOW IT IS DIAGNOSED
Echocardiogram, ECG, blood tests, and chest imaging

MAIN TREATMENT
Medicines, nutrition support, procedures, devices, or transplant

CAN IT BE CURED?
Sometimes - when the cause can be corrected

IS IT AN EMERGENCY?
Sometimes - with severe breathing trouble or collapse

LONG-TERM OUTLOOK
Many do well; some need lifelong specialist care

Overview

Heart failure means the heart is not pumping blood effectively, filling normally, or both. As a result, the body may not receive enough oxygen-rich blood. Blood and fluid can also back up into the lungs, liver, abdomen, or other tissues.

Heart failure does not mean that the heart has stopped. A stopped heart is called cardiac arrest, which is different and is always an emergency.

In children, heart failure is often linked to a heart defect present from birth, a problem with the heart muscle, or an abnormal heart rhythm. The causes and symptoms can be different from those commonly seen in adults.

Babies may have trouble feeding or gaining weight because feeding requires significant effort.

Older children may become tired or breathless during activity. Symptoms can develop suddenly, but they may also appear gradually over weeks or months.

Heart failure ranges from mild to severe. Some causes can be corrected or improve with time. Other children need long-term treatment to support the heart and manage symptoms.

Symptoms

Symptoms depend on the child's age, the cause, and how much the heart's function is affected.

In babies and young children, possible signs include:

Older children and teenagers may notice shortness of breath during exercise or when lying flat. They may tire more easily, struggle to keep up with friends, cough at night, or need more pillows to sleep comfortably.

Fluid buildup may cause rapid weight gain, swollen ankles, or a swollen and uncomfortable abdomen. Some children have nausea, poor appetite, or abdominal pain because blood is backing up around the liver and digestive organs.

These symptoms can also occur with lung infections, anemia, feeding problems, and other conditions. Symptoms alone cannot confirm heart failure.

- Fast or difficult breathing, especially during feeding
- Sweating or becoming tired while feeding
- Taking a long time to feed or drinking less than usual
- Poor weight gain or slowed growth
- Irritability, unusual sleepiness, or reduced activity
- A fast heartbeat
- Swelling around the eyes, legs, feet, or abdomen
- Fewer wet diapers when circulation or kidney function worsens

Causes and risk factors

Congenital heart defects are structural heart problems present from birth. Some defects make the heart pump against unusually high pressure or send too much blood to the lungs. Heart failure can develop before a defect is repaired, after surgery, or later if the heart continues to

work harder than normal.

Cardiomyopathy is a group of conditions affecting the heart muscle. The muscle may become enlarged and weak, unusually thick, or stiff. Some cardiomyopathies are inherited, while others have no identified cause.

Myocarditis is inflammation of the heart muscle. It is often associated with a viral infection, although the exact trigger is not always found. The inflammation can temporarily or permanently reduce pumping strength.

Other possible causes include:

A family history of cardiomyopathy, unexplained sudden death, or serious heart rhythm problems may point to an inherited cause. However, having a risk factor does not mean that a child will develop heart failure.

- Heart rhythms that remain too fast or too slow
- Heart valve problems
- High pressure in the blood vessels of the lungs
- Damage from certain medicines, including some cancer treatments
- Severe infections, anemia, or kidney disease that strain the heart
- Metabolic or genetic conditions affecting how cells produce energy

Diagnosis

A clinician will ask about breathing, feeding, growth, activity, infections, medicines, and family heart history. The examination may include listening for abnormal heart or lung sounds and checking the pulse, blood pressure, oxygen level, liver size, and signs of swelling.

An echocardiogram is a painless ultrasound scan of the heart. It shows the heart's structure, how well it pumps and relaxes, how the valves work, and whether blood is flowing in an unusual direction. It is one of the main tests used to assess suspected heart failure.

Other tests may include:

Cardiac catheterization is sometimes needed. A thin tube is passed through a blood vessel to the heart to measure pressures or examine blood flow. Genetic testing may be offered when an inherited cardiomyopathy or rhythm condition is suspected. Results can sometimes have implications for siblings and parents.

- An electrocardiogram, or ECG, to record the heart's electrical activity

- A chest X-ray to look at heart size and fluid in the lungs
- Blood tests for anemia, infection, kidney and liver function, and signs of heart strain
- Heart rhythm monitoring over one or more days
- Cardiac MRI for detailed images of the heart muscle
- Exercise testing in older children who can safely take part

Treatment and management

Treatment aims to improve circulation, reduce fluid buildup, ease the heart's workload, support growth, and address the underlying cause. Care is usually coordinated by a pediatric cardiology team.

Diuretics like furosemide or hydrochlorothiazide help the kidneys remove excess salt and water. Other heart medicines may relax blood vessels, lower the heart's workload, control blood pressure, or help the heart pump more effectively. Medicines may also be used to control an abnormal rhythm or reduce the risk of blood clots in selected children.

Evidence for some heart failure medicines is less extensive in children than in adults. Treatment therefore considers the child's age, heart structure, cause of heart failure, kidney function, blood pressure, and response to therapy. Do not change or stop a heart medicine without guidance from the prescribing team.

Babies who become tired while feeding may need smaller, more frequent feeds or higher-calorie nutrition. Some need temporary feeding through a tube. This can conserve energy and support growth; it does not mean that a parent has failed to feed the child successfully.

The underlying problem may need separate treatment. This could include surgery or a catheter procedure for a congenital heart defect, treatment of a rhythm problem, or changes to a medicine that has affected the heart.

Children with severe symptoms may need treatment in hospital. Oxygen, breathing support, and medicines given through a vein may be used when circulation or breathing needs close support.

Some children benefit from an implanted pacemaker or defibrillator. A ventricular assist device is a mechanical pump that supports blood flow when the heart is very weak. It may be used while the heart recovers or while a child waits for a transplant. Heart transplantation is considered when severe heart failure cannot be controlled with other treatments.

Complications

Heart failure can interfere with feeding, growth, school attendance, sleep, and physical activity. Reduced circulation may affect the kidneys or liver, while fluid buildup can make breathing difficult.

Possible complications include abnormal heart rhythms, blood clots, stroke, worsening valve leakage, and high pressure in the lungs. Severe heart failure can lead to shock, in which vital organs do not receive enough blood.

Medicines and procedures can also have unwanted effects. Regular blood tests, scans, and clinic visits help the care team find changes before they cause major symptoms.

Prevention

Many cases of heart failure in children cannot be prevented. Congenital heart defects, inherited cardiomyopathies, and many cases of myocarditis are not caused by anything a child or parent did.

For children with a known heart condition, keeping scheduled follow-up appointments and taking medicines as directed can reduce avoidable worsening. Families should have a clear plan for missed doses, illness, and changes in symptoms.

Routine vaccinations and ordinary infection precautions support general health, but they cannot prevent every infection associated with myocarditis. Genetic counseling may help a family understand inherited risk, although it cannot remove that risk.

Living with it and what to expect

The course of heart failure is closely tied to its cause. A child with a heart defect may improve after repair. Some children with myocarditis recover much or most of their heart function. Cardiomyopathy may remain stable, improve, or worsen over time. It is not always possible to predict the course early on.

Follow-up commonly includes examinations, echocardiograms, ECGs, blood tests, and checks of growth and development. Appointments may become less frequent when the condition is stable, but some children need lifelong cardiology care.

Most children benefit from taking part in school, friendships, and suitable physical activity. Activity advice is individual because safe limits differ between heart conditions. Competitive

sports or intense exercise may require specific assessment. Everyday movement may still be encouraged when it is safe.

Families may be asked to watch for changes in breathing, feeding, swelling, energy, or weight. The care team may also provide a written action plan explaining which changes can wait for a routine appointment and which need prompt assessment.

Repeated appointments or limits on activity can affect mood and family life. Age-appropriate explanations, school support, and psychological care can help. Teenagers will gradually need to understand their condition, medicines, and follow-up plan as they move toward adult heart services.

When to get medical help

Call emergency services if a child:

Seek urgent same-day medical advice for noticeably faster or harder breathing, new swelling, repeated vomiting, much poorer feeding, fewer wet diapers, or a sudden drop in energy. Rapid weight gain over a short period may represent fluid buildup if the child's care team has advised weight monitoring.

Contact the child's cardiology or primary care team soon for gradual changes, such as increasing tiredness, slower growth, more difficulty with usual activity, or possible medicine side effects. These are important but are not always emergencies.

Continue routine follow-up even when the child feels well. Heart function or treatment needs can change before obvious symptoms appear.

- Has severe difficulty breathing, is gasping, or cannot speak or feed
- Develops blue, gray, or very pale lips or skin
- Collapses, becomes unresponsive, or is very difficult to wake
- Has signs of poor circulation, such as cold mottled skin with confusion
- Has sudden severe chest pain, especially with fainting or breathing trouble

Common questions

Can heart failure in a child go away?

Sometimes. Heart function may improve after repair of a heart defect, control of an abnormal rhythm, or recovery from myocarditis. Other causes, including some cardiomyopathies, may

require lifelong monitoring and treatment.

Is heart failure the same as a heart attack?

No. Heart failure means the heart is not pumping or filling well enough. A heart attack happens when blood flow to part of the heart muscle is suddenly blocked. Heart attacks are uncommon in children.

Can a child with heart failure go to school?

Many can attend school, although appointments, fatigue, or treatment may affect attendance. A school health plan can explain medicines, activity limits, rest needs, and what staff should do if symptoms worsen.

Can children with heart failure exercise or play sports?

Many can be active, but the safe type and intensity depend on the cause, heart rhythm, symptoms, and test results. The cardiology team can provide activity guidance for school, recreation, and organized sports.

Does coughing mean heart failure is getting worse?

Not necessarily. Coughing is common with colds, asthma, and other childhood illnesses. A new cough is more concerning when it occurs with fast breathing, trouble lying flat, swelling, poor feeding, or reduced energy.

Will brothers or sisters need heart tests?

They may if an inherited cardiomyopathy or rhythm condition is suspected. Genetic counseling and family heart screening may be recommended based on the child's diagnosis and family history.

Sources

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