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Heart failure in children

Heart failure is a condition that results when the heart is no longer able to effectively pump oxygen-rich blood to meet the oxygen needs of the body's tissues and organs.

Heart failure can occur when:

- Your child's heart muscle weakens and cannot pump the blood out of the heart very well.
- Your child's heart muscle is stiff and the heart does not fill up with blood as easily.

Causes

The heart is composed of two independent pumping systems. One is on the right side, and the other is on the left. Each has two chambers, an atrium and a ventricle. The ventricles are the major pumps in the heart.

The right system receives blood from the veins of the whole body. This is "blue" blood, which is poor in oxygen and rich in carbon dioxide.

The left system receives blood from the lungs. This is "red" blood which has become rich in oxygen after passing through the lungs. Blood leaves the heart through the aorta, the major artery that feeds blood to the entire body.

Valves are flaps that open and close so blood will flow in the right direction. There are four valves in the heart.

One common way heart failure occurs in children is when the blood from the left side of the heart mixes with the right side of the heart. This leads to an overflow of blood into the lungs or one or more chambers of the heart. This occurs most often due to birth defects of the heart or major blood vessels. These include:

- A hole between the right or left upper or lower chambers of the heart
- A defect of the major arteries
- Defective heart valves that are leaky or narrowed
- A defect in the formation of the heart chambers

Abnormal development or damage to the heart muscle is the other common cause of heart failure. This may be due to:

- Infection from a virus or bacteria that causes damage to the heart muscle or heart valves
- Medicines used for other illnesses, most often cancer medicines

- Abnormal heart rhythms
- Muscle disorders, such as muscular dystrophy
- Genetic disorders leading to abnormal development of the heart muscle

Symptoms

As the heart's pumping becomes less effective, blood may back up in other areas of the body.

- Fluid may build up in the lungs, liver, abdomen, and the arms and legs. This is called "congestive heart failure" or just "heart failure".
- Symptoms of heart failure may be present at birth, start during the first weeks of life, or develop slowly in an older child.

Symptoms of heart failure in infants may include:

- Breathing problems, such as rapid breathing or breathing that appears to take more effort. These may be noticed when the child is resting or when feeding or crying.
- Taking longer than normal to feed or becoming too tired to continue feeding after a short time.
- Noticing a fast or strong heart beat through the chest wall when the child is at rest.
- Not gaining enough weight.

Common symptoms in older children are:

- Cough
- Fatigue, weakness, faintness
- Loss of appetite
- Need to urinate at night
- Pulse that feels fast or irregular, or a sensation of feeling the heart beat (palpitations)
- Shortness of breath when the child is active or after lying down
- Swollen (enlarged) liver or abdomen
- Swollen feet and ankles
- Waking up from sleep after a couple of hours due to shortness of breath
- Weight gain

Exams and Tests

The health care provider will examine your child for signs of heart failure:

- Fast or difficult breathing
- Foot or leg swelling (edema)
- Neck veins that stick out (are distended)
- Sounds (crackles) from fluid buildup in your child's lungs, heard through a stethoscope
- Swelling of the liver or abdomen

- Uneven or fast heartbeat and abnormal heart sounds

Many tests are used to diagnose and monitor heart failure.

A chest x-ray and an echocardiogram are most often the best first tests when heart failure is being evaluated. Your provider will use them to guide your child's treatment.

Cardiac catheterization involves passing a thin flexible tube (catheter) into the right or left side of the heart. It may be done to measure pressure, blood flow, and oxygen levels in different parts of the heart.

Other imaging tests can look at how well your child's heart is able to pump blood, and how much the heart muscle is damaged.

Many blood tests may also be used to:

- Help diagnose and monitor heart failure
- Look for possible causes of heart failure or problems that may make heart failure worse
- Monitor for side effects of medicines your child may be taking

Treatment

Treatment often involves a combination of monitoring, self-care, and medicines and other treatments.

MONITORING AND SELF-CARE

Your child will have follow-up visits at least every 3 to 6 months, but sometimes much more often. Your child will also have tests to check heart function.

All parents and caregivers must learn how to monitor the child at home. You also need to learn the symptoms that heart failure is getting worse. Recognizing the symptoms early will help your child stay out of the hospital.

- At home, watch for changes in heart rate, pulse, blood pressure, and weight.
- Talk to your child's provider about what you should do when weight goes up or your child develops more symptoms.
- Limit how much salt your child eats. Your provider may also ask you to limit how much fluid your child drinks during the day.
- Your child needs to get enough calories to grow and develop. Some children require feeding tubes.
- Your child's provider can provide a safe and effective exercise and activity plan.

MEDICINES, SURGERY, AND DEVICES

Your child will need to take medicines to treat heart failure. Medicines treat the symptoms and prevent heart failure from getting worse. It is very important that your child take any medicines as directed by the health care team.

These medicines may:

- Help the heart muscle pump better
- Open up blood vessels or slow the heart rate so the heart does not have to work as hard

- Reduce damage to the heart
- Reduce the risk for abnormal heart rhythms
- Rid the body of excess fluid and salt (sodium)
- Replace potassium
- Prevent blood clots from forming

Your child should take medicines as directed. DO NOT take any other medicines or herbs without first asking the provider about them. Common medicines that may make heart failure worse include:

- Ibuprofen (Advil, Motrin)
- Naproxen (Aleve, Naprosyn)

The following surgeries and devices may be recommended for some children with heart failure:

- Surgery to correct different heart defects.
- Heart valve surgery.
- A pacemaker can help treat slow heart rates or help both sides of your child's heart contract at the same time. A pacemaker is a small, battery-operated device that is inserted under the skin on the chest.
- Children with heart failure may be at risk for dangerous heart rhythms. They often receive an implanted defibrillator.
- Heart transplantation may be needed for severe, end-stage heart failure.

Outlook (Prognosis)

Long-term outcomes depend on a number of factors. These include:

- What types of heart defects are present and whether they can be repaired
- Severity of any permanent damage to the heart muscle
- Other health or genetic problems that may be present

Often, heart failure can be controlled by taking medicine, making changes in lifestyle, and treating the condition that caused it.

When to Contact a Medical Professional

Contact your provider if your child develops:

- Increased cough or phlegm
- Sudden weight gain or swelling
- Poor feeding or poor weight gain over time
- Weakness
- Other new or unexplained symptoms

Go to the emergency room or call the local emergency number (such as 911) if your child:

- Faints
- Has a fast and irregular heartbeat (especially with other symptoms)
- Feels a severe crushing chest pain

Alternative Names

Congestive heart failure - children; Cor pulmonale - children; Cardiomyopathy - children; CHF - children; Congenital heart defect - heart failure in children; Cyanotic heart disease - heart failure in children; Birth defect of the heart - heart failure in children

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