

Congestive heart failure

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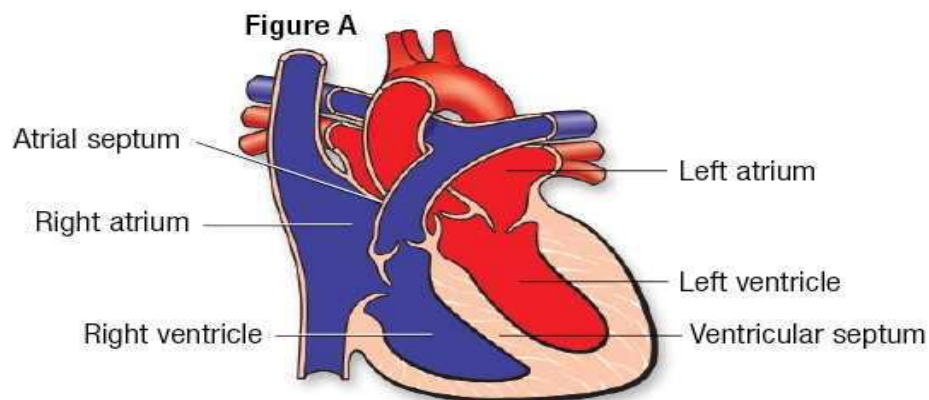
Congestive heart failure is a condition in which the heart cannot adequately pump blood. Because the pumping action of the heart is reduced, blood backs up into certain body tissues, causing fluid buildup.

What is going on in the body?

Congestive heart failure is caused by a variety of complex problems that cause the pumping chambers of the heart to fail.

The heart is divided into a left heart and a right heart. The blood receives oxygen as it passes through the lungs. The left heart receives blood from the lungs and pumps this oxygen-rich blood to the organs, muscles, and tissues of the body. The right heart receives oxygen-poor blood from these organs and tissues. It then pumps it to the lungs to receive a fresh supply of oxygen.

If the pumping chambers of the heart do not function properly, blood stays in the lungs or in the tissues of the body. This leads to congestion of these areas with blood and fluid, the reason for the term congestive heart failure. The organs and tissues do not receive an adequate supply of blood, and they begin to suffer the effects.



The causes and risks of the condition

The most common cause of congestive heart failure in children is congenital heart disease, including:

- ☐ Cardiac malformations, such as tetralogy of Fallot
- ☐ Abnormalities of the heart valves
- ☐ Under development of one or both ventricles
- ☐ Coarctation of the aorta, which is a narrowing of the vessel bringing blood to the heart
- ☐ Ventricular septal defects or holes in the walls that separate the left and right sides of the heart
- ☐ Patent ductus arteriosus, or an abnormal connection between the aorta and the pulmonary artery that mixes oxygenated and unoxygenated blood

Other causes of congestive heart failure in children include:

- ☐ Rheumatic heart disease, caused by damage to the heart from group A strep infections
- ☐ Bacterial endocarditis or inflammation of the lining of the heart due to an infection
- ☐ Myocarditis or inflammation of the heart muscle
- ☐ Complications of open heart surgery
- ☐ Chronic anemia, which results in a low red blood cell count
- ☐ Poor nutrition
- ☐ Drug toxicity

Symptoms & Signs

Most of the time, congestive heart failure occurs quickly in children. Failure of both ventricles is common. This causes a combination of symptoms, including:

- ☐ Shortness of breath
- ☐ Rapid breathing
- ☐ A rapid heartbeat
- ☐ Coughing and wheezing
- ☐ Irritability
- ☐ Failure to thrive, meaning that the child's growth and weight gain are slower than expected
- ☐ Excessive sweating
- ☐ Loss of appetite
- ☐ Swelling of the hands and feet
- ☐ Pain and tenderness of the abdomen
- ☐ Coolness of extremities to the touch
- ☐ Grayish tint to the skin

Diagnosed

Congestive heart failure is diagnosed on the basis of the child's medical history and physical exam. Identification of the underlying disease may require special tests, including:

- ☐ Electrocardiogram, or ECG, which graphs the electrical activity of the heart
- ☐ Chest X-ray, which may reveal an abnormally enlarged heart
- ☐ Echocardiography, which uses ultrasound waves to provide information about the structure, function, and motion of the heart

- Cardiac catheterization, which involves injection of a contrast agent to allow the doctor to watch the blood flow through the heart and its arteries
- Complete blood count, renal function, blood gas analysis, blood culture.

Prevention

- Prompt treatment of the underlying disease can lower the child's risk of developing congestive heart failure.
- Maintaining a healthy body weight, including physical activity in everyday life, and eating a diet designed to minimize heart disease can help minimize congestive heart failure.
- Check and observe the child continuously.

Long-term effects of the condition

If untreated, congestive heart failure in children can lead to early death. Long-term effects may include delays in the child's development and permanent damage to organs such as the brain, liver, and kidneys.

Treatment & Monitoring

- Giving oxygen
- Limiting sodium in the diet
- Treating underlying anemia.
- A heart medication called digitalis can be used to help improve the efficiency of the heart. Water pills help relieve some of the pressure on the heart by removing extra fluid.
- In severe cases, stronger heart medications can be used to help the heart pump with more forceful contractions. Medications that relax the blood vessels can also be used. If the cause of CHF is congenital heart disease, open heart surgery may be done.

Nursing care

- Monitor respiratory rate (\uparrow RR), rhythm and character every hourly. Be alert to increased respiratory rate; observe use of accessory muscles of respiration.
- Auscultate breath sounds and lung fields for noting crackles, wheezes, rhochi and other sounds.
- Provide supplemental oxygen to maintain O_2 saturation to $>95\%$ by tent or by nasal catheter.
- Assess ABGs; note changes in response to O_2 supplementation or treatment of altered hemodynamics.
- Suction secretions, as needed.
- Encourage deep breathing, coughing q24.
- Place in propped up position to maximize chest excursion.
- Monitor intake and output. Report positive fluid state or decreased urine output.
- Check weight properly daily and report changes.
- Observe for weight gain, oedema and murmures.
- Check heart sounds.
- Administer antibiotics, as prescribed, according to the cause.
- Administer diuretics (usual drug is frusemide in a dose 1 – 3 mg/kg orally or 0.5 – 1.5 mg parentally).
- Observe for potassium deficiency.
- Limit oral fluids.
- Maintain prescribed activity level.
- Administer digoxin as prescribed.
- During digitalization, one half of the total calculated doses should be given state. Divide the remaining dose into two halves and administer at 8 hours intervals.
- Digitalis must be used carefully to avoid toxic effects.
- Check the heart rate correctly to identify complications.
- Organize nursing activities so that rest periods are provided properly.
- Assist in laboratory investigations.