

Problem:

Cardiovascular disorders can be inherited or caused by disease or distress of the embryo during its development. This category includes Tetralogy of Fallot, pulmonary atresia with VSD, hypoplastic left heart syndrome, transposition of the great vessels, and truncus arteriosus. They are usually characterized by:

- a hole between the right and left sides of the heart;
- an abnormal number of heart chambers;
- abnormalities of the heart valves or major blood vessels near the heart;
- abnormal placement or twisting of the heart.
- other variations from normal.

CYANOTIC TYPE: Arterial blood has high oxygen content and is bright red; low O₂ content is dark red because it has lower oxygen content. As dark red venous blood passes through the lungs, it is re-oxygenated and pumped out through the arteries to the body. In most cases of cyanotic congenital heart disease, venous blood escapes through an abnormal opening in the heart, enters into, mixes with, and darkens the arterial blood. Symptoms:

1. A bluish tinge is seen around the lips and fingertips. After several years the fingertips become swollen. This is called “clubbing”.
- 2 Impaired body growth because the tissues receive a poor oxygen supply, and resistance to infection is low; the child is sickly and frequently absent from school.
3. Breathing is deeper and faster to get sufficient oxygen. Very little exercise is tolerated, and requires frequent rest. Chronic shortness of breath makes speaking difficult.
4. The brain receives less oxygen, which impairs cerebral processes in many subtle ways. Many of these children have learning problems.

The extent of the symptoms depends on the amount of the oxygen deficit. Other factors that influence the severity of the symptoms are the size of the heart, the regularity of the heartbeat, and the blood pressure.

NON-CYANOTIC TYPE: In many cases non-cyanotic heart disease causes no symptoms in childhood. As the child grows older, the heart gets abnormally large because of the extra workload, having to pump a larger than normal volume of blood. The enlarged heart is a weak heart and eventually decompensates (fails). When this happens, the child begins to show many of the same symptoms as the child with cyanotic heart disease.

This type of heart problem is usually diagnosed with a stethoscope. A murmur, by its sound and location, can guide the cardiologist to perform the kinds of tests that lead to an exact diagnosis. By the time they start having symptoms, it is usually too late to effect a complete cure.

Role of the School/School Nurse:

In both cyanotic and non-cyanotic heart disease in children of school age, treatment consists of surgical repair of the abnormality. Not all congenital cardiac abnormalities can be repaired. When the conditions are so severe and complicated that complete cure by surgery is impossible, palliative procedures often can be performed that give partial relief.

Many children with cardiovascular disorders attend school every day. Most are in mainstream regular classes. Some have had operations, and some have not.

Most children with cardiovascular disorders will be under a physician's care. The school nurse should maintain contact with the doctor's office for any special instructions that may be necessary. The nurse should also act as an intermediary between the educational and medical personnel to make sure the efforts of both are coordinated for the child's welfare. This will be especially true in these instances:

- 1 **Services.** If the child's condition causes an adverse effect on educational performance, he/she may be eligible for special education or services under the 504 of the Rehabilitation Act. The school nurse may contribute to the development of an individual educational plan by developing an individual health plan to meet the unique needs of the student.
- 2 **Restriction** of physical activity. Almost all children with congenital heart disease can be allowed to regulate their own activity; they will stop when tired. The school nurse may need to reinforce teachers' efforts to keep some overeager children from exceeding their capabilities.
- 3 **School attendance.** Some principals and teachers are overly fearful when children with symptomatic or cyanotic congenital heart disease attend school. As long as contact can be maintained between doctor, parent or relative, the school nurse or building administrator, the child should be encouraged to attend classes as much as possible. Children who have inoperable conditions and a short life span need as much normal activity as they can comfortably tolerate.

Resources:

American Heart Association Maine Medical
Center Pediatric Cardiac Unit School Health
Manual – Emergencies Section

Nancy Dube, School Nurse Consultant
Department of Education
624-6688, Nancy.Dube@Maine.Gov