



## An Overview on Congenital Heart Disease and its Classification

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### DESCRIPTION

Vascular Congenital Heart Disease (CHD) demonstrates a complicated combination of genetic and environmental variables that impact heart development during fetal life. Despite acquired heart diseases, CHD develops at birth and includes a wide spectrum of structural abnormalities in the heart and its major blood arteries.

Congenital heart disease develops from a combination of genetic and environmental factors. While certain genetic mutations may contribute individuals to CHD, exposure to environmental factors during pregnancy, such as infections, medications, or maternal health conditions, can also contribute to the development of structural abnormalities in the fetal heart.

The heart requires a complicated development during embryogenesis, and disruptions during specific periods can lead to congenital heart defects. Factors influencing heart development include the formation of heart tubes, septation of the heart chambers, and the development of heart valves and major blood vessels.

### Classification of congenital heart disease

Some of the major classifications include:

**Structural abnormalities:** CHD encompasses a broad spectrum of structural abnormalities, ranging from simple defects, such as Atrial Septal Defects (ASD) or Ventricular Septal Defects (VSD), to complex malformations such as tetralogy of Fallot or transposition of the arteries. These anomalies may involve the heart valves, chambers, or major blood vessels.

**Cyanotic and Acyanotic defects:** Congenital heart defects are frequently categorized as cyanotic or acyanotic based on the level of oxygen saturation in the blood. Cyanotic defects, such as tetralogy of Fallot, result in decreased oxygen levels, leading to a bluish discoloration of the skin and mucous membranes. Acyanotic defects, such as atrial septal defects, typically present with normal oxygen saturation.

### Diagnostic approaches

Common diagnostic methods include:

**Prenatal screening and diagnosis:** Advances in prenatal screening techniques, including fetal echocardiography and genetic testing, allow for the early detection of congenital heart defects during pregnancy. This enables healthcare providers to counsel parents, plan for potential interventions, and optimize postnatal care for infants with CHD.

**Postnatal diagnosis:** Postnatal diagnosis frequently involves a combination of physical examinations, imaging studies, and diagnostic procedures. Echocardiography, a non-invasive imaging technique, it is the foundation in diagnosing congenital heart defects, providing detailed insights into the structure and function of the heart.

**Cardiac catheterization and angiography:** In certain cases, invasive procedures such as cardiac catheterization and angiography may be employed to obtain detailed images of the heart and blood vessels. These procedures help to establish the anatomy of complex defects and helps in establish surgical interventions.

### Treatment modalities

Some significant methods include:

**Medical management:** Depending on the type and severity of the congenital heart defect, medical management may involve medications to address symptoms, improve heart function, or prevent complications. For example, diuretics may be prescribed to manage fluid retention, while medications such as prostaglandins may be used to maintain ductal patency in certain conditions.

**Surgical interventions:** Many congenital heart defects require surgical interventions to correct anatomical abnormalities and improve blood flow. Surgical procedures range from relatively simple repairs, such as closing an atrial septal defect, to complex surgeries, including the correction of transposition of the arteries or Fontan procedures for single ventricle physiology.

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**Catheter-based interventions:** Minimally invasive catheter-based interventions have revolutionized the management of certain congenital heart defects. Procedures such as balloon

valvuloplasty or device closure of septal defects can be performed through catheters inserted into blood vessels, reducing the need for open-heart surgery.