Cardiac embryology related clinical conditions

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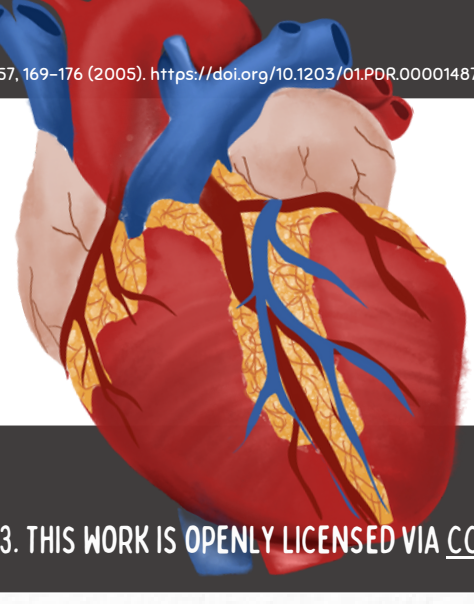
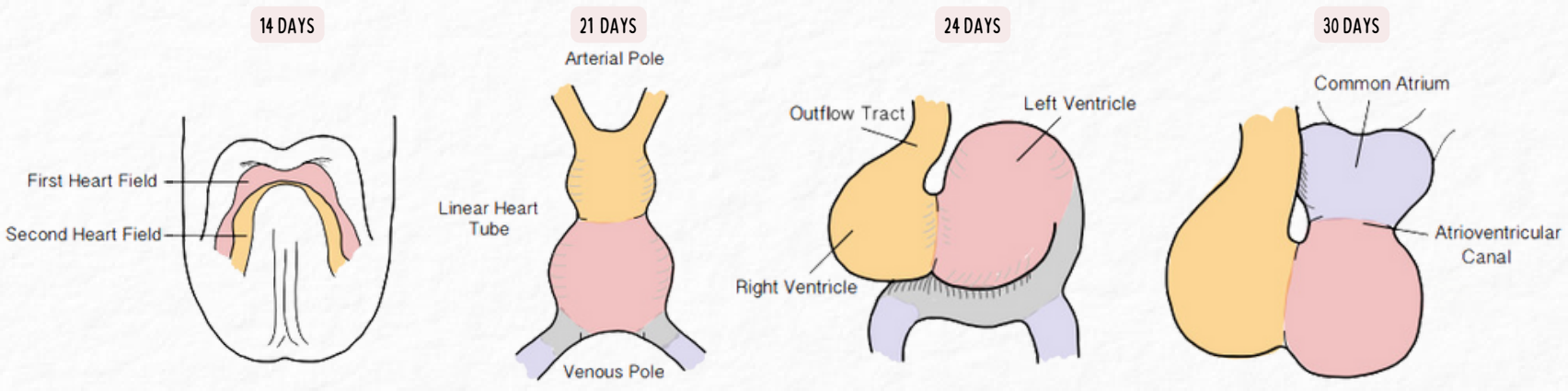
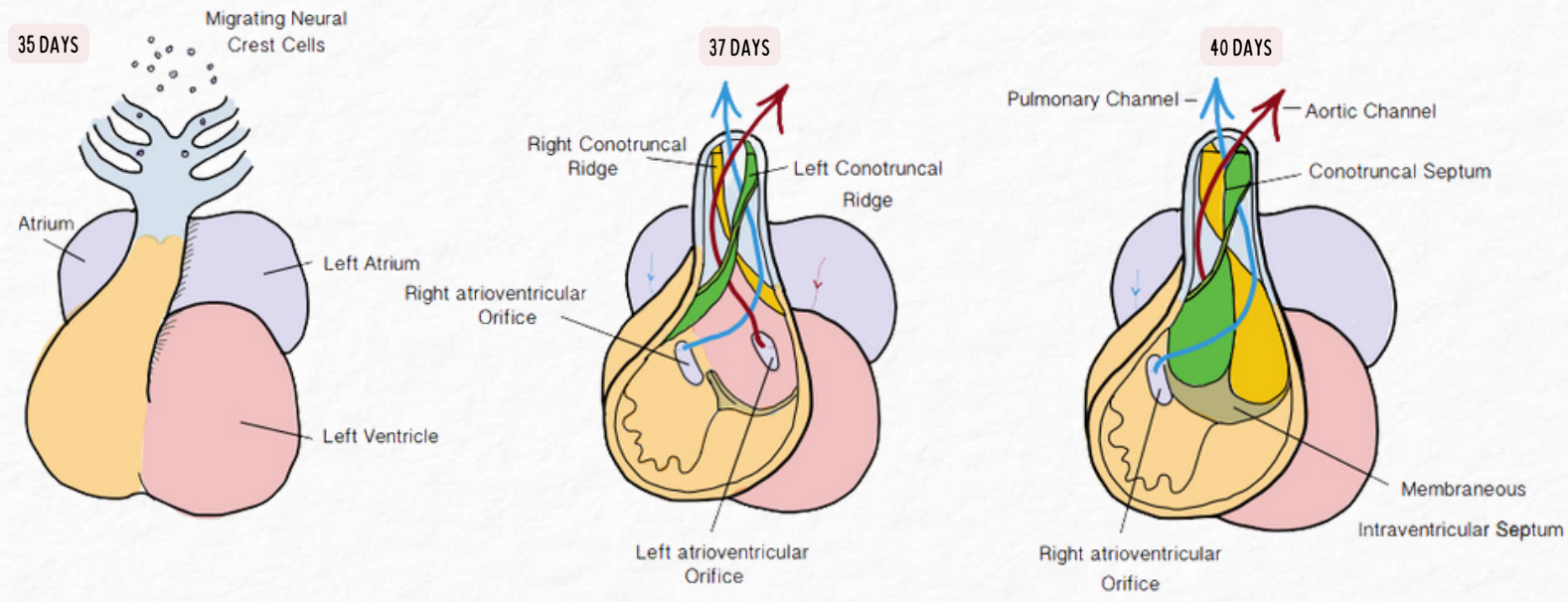
HIGH YIELD

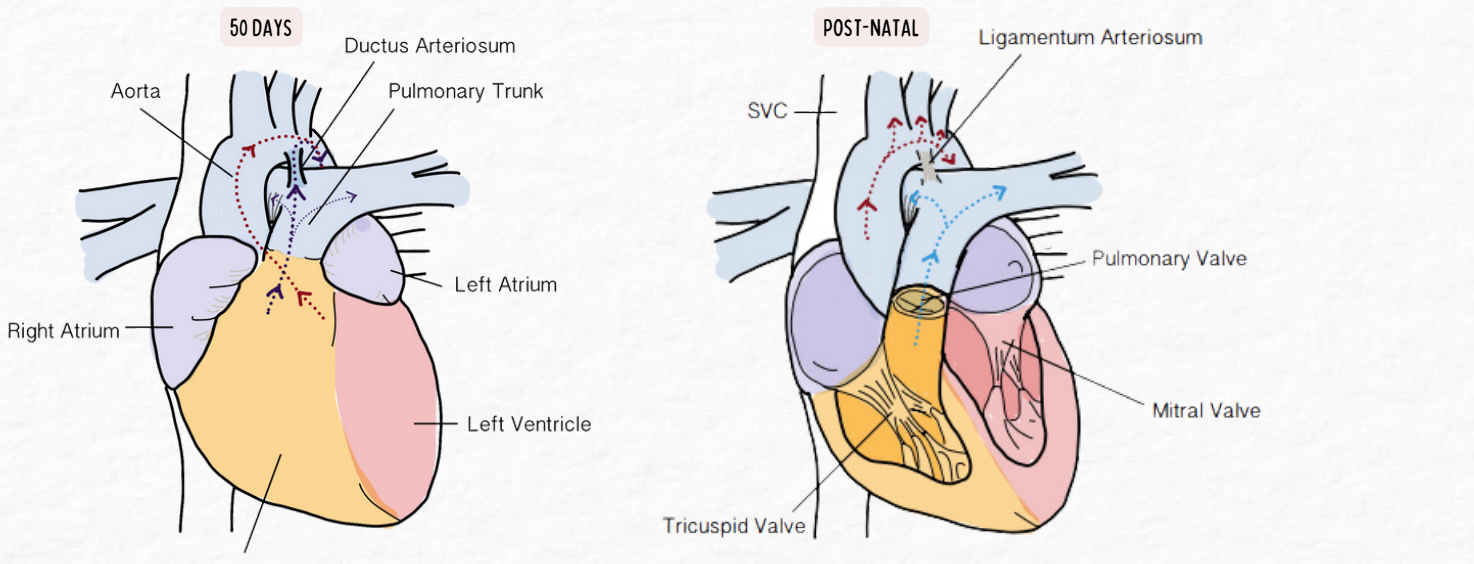
CARDIAC EMBRYOLOGY RELATED CLINICAL CONDITIONS:

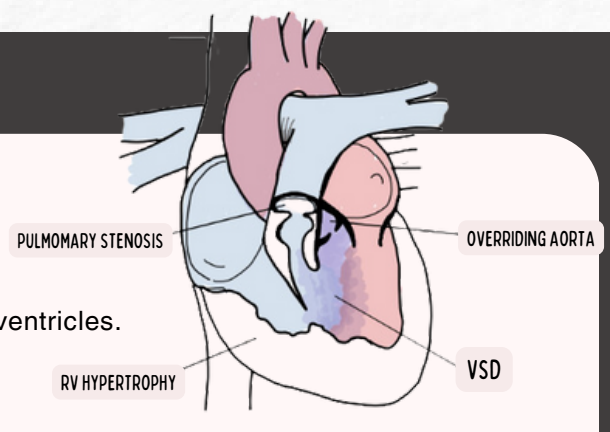


CARDIAC EMBROLOGY







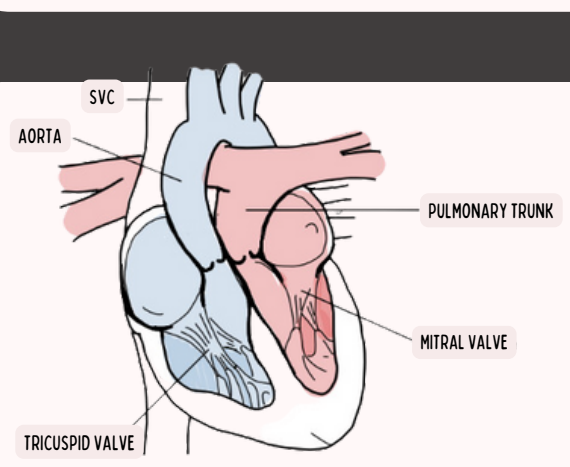


TETRALOGY OF FALLOT (TOF)

Congenital heart defect characterized by a combination of four key anomalies:

- **Ventricular Septal Defect (VSD):** Failure of proper fusion of the interventricular septum.
- **Overriding Aorta:** The aorta is displaced, allowing it to receive blood from both the right and left ventricles.
- **Pulmonary Stenosis:** Narrowing of the pulmonary outflow tract.
- **Right Ventricular Hypertrophy:** Enlargement of the right ventricle due to increased workload.

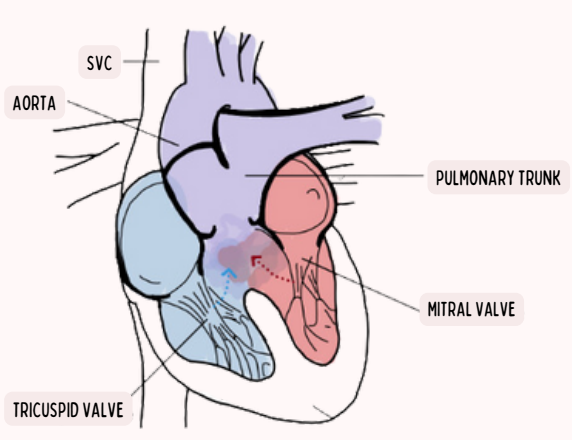
The primary surgical procedure for TOF is known as intracardiac repair or complete repair. It involves closing the VSD, widening the narrowed pulmonary valve or artery, and repositioning the aorta to its proper location.
In some cases, a temporary procedure called a "palliative shunt" might be performed if the infant is too small or not stable enough for complete repair. This shunt creates a temporary pathway to increase blood flow to the lungs, improving oxygen levels until the child is ready for the full repair.



TRANSPOSITION OF THE GREAT ARTERIES (TGA)

Refers to the condition where the **aorta and the pulmonary artery are switched in position which results from the lack of spiraling of the aorticopulmonary (conotruncal) septum during embryogenesis**.

Infants with TGA typically present with cyanosis shortly after birth. Diagnosis is usually confirmed through echocardiography. The primary treatment for TGA is surgical correction, often referred to as an arterial switch operation, and must be done shortly after birth to reposition the arteries in their correct locations.



PERSISTENT TRUNCUS ARTERIOSUS (PTA)

Refers to the condition where the **aorta and the pulmonary artery are not seperated which results from an lack of development of the aorticopulmonary (conotruncal) septum during embryogenesis**.

Infants with PTA typically present with cyanosis and inadequate oxygen supply to the body's tissues. Diagnosis is usually confirmed through echocardiography. Surgical intervention is typically necessary and usually involves multiple procedures to separate the single vessel into a pulmonary artery and an aorta, and to repair any associated defects. Early detection and appropriate treatment are crucial for better outcomes in affected individuals.

VENTRICULAR SEPTAL DEFECT (VSD) & ATRIAL SEPTAL DEFECT (ASD)

VSD **is a common congenital heart defect where septum between the ventricles doesn't fully close during fetal development.** This hole allows oxygenated blood to flow from the left ventricle to the right ventricle (which pumps blood to the lungs to be oxygenated) instead of going out to the body.

ASD **is a congenital heart defect that occurs when the septum between the atria doesn't fully close during fetal development,** leaving an opening through which blood can flow between the left and right atria. This allows oxygenated blood from the left atrium to mix with deoxygenated blood from the right atrium.

The treatment for VSD and ASD varies depending on the size of the defect, the severity of symptoms, and the child's age. In many cases:

- **Monitoring**: Small VSD and ASDs often close on their own without intervention. (Regular check-ups are necessary)
- **Medication:** These could include medications such as diuretics, ACE inhibitors, Betablockers, Digoxin and Anticoagulants.
- **Surgery:** If the VSD or ASD is large, causing significant symptoms or leading to complications like heart failure or pulmonary hypertension, surgical repair may be necessary. Surgeons can patch the hole using various techniques, either through open-heart surgery or minimally invasive procedures.
- **Catheter procedures:** In some cases, especially with smaller VSD and ASDs, doctors may opt for catheter-based procedures, where a device is inserted through a blood vessel and guided to the heart to close the hole.

The goal of treatment is to prevent complications associated with the VSD/ASD, such as heart failure, arrhythmias, or pulmonary hypertension, and to improve the heart's function and overall health.