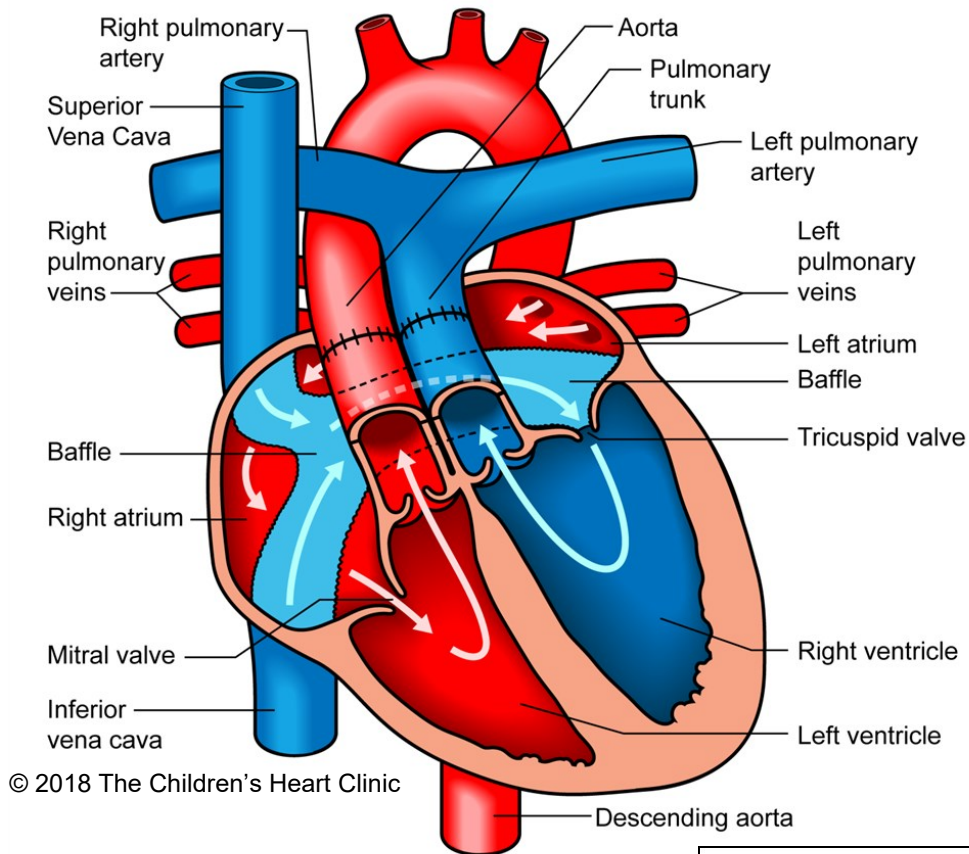
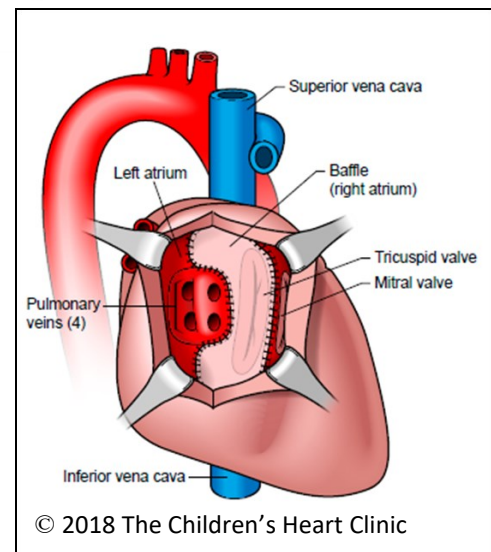


Double Switch Operation



Notes:



The Children's Heart Clinic, 2530 Chicago Avenue S, Ste 500, Minneapolis, MN 55404
612-813-8800 * Toll Free: 1-800-938-0301 * Fax: 612-813-8825
Children's Hospital of Minnesota, 2525 Chicago Avenue S, Minneapolis, MN 55404

Double Switch Operation (Arterial + Atrial Switch)

A double switch operation is used to correct congenitally corrected transposition of the great arteries (or L-TGA). In congenitally corrected transposition of the great arteries, both the ventricles (pumping chambers) and great vessels (aorta & pulmonary trunk) are transposed (on the opposite side). Therefore, the circulation is still physiologically normal. Deoxygenated blood is pumped to the lungs to be oxygenated, and oxygenated blood is pumped out to the body. However, the morphologic right ventricle (RV) is pumping blood to the body, instead of the morphologic left ventricle (LV). Overtime, the work of pumping blood to the body can strain the morphologic RV, leading to heart failure. The double switch operation is designed to restore a more normal arrangement where the RV pumps deoxygenated blood to the lungs and the LV pumps oxygenated blood to the body.

The timing of when the double switch operation is performed depends on the patient's anatomy. Typically, procedures leading to the double switch can start as an infant, although in some instances are not done until later in childhood. An example of an early operation is a pulmonary artery (PA) band which may be placed prior to the double switch operation. The purpose of the PA band is to re-train the morphologic LV to withstand the increased work needed to pump blood out to the body.

The double switch is made to reroute the blood flow in the arteries (arterial switch) and the atria (atrial switch). At the time of the double switch operation, a median sternotomy (incision through the middle of the chest) is performed. The child is placed on cardiopulmonary bypass (heart-lung machine). For the arterial switch portion of the operation, both the aorta and PA are divided. If indicated, a Lecompte maneuver can be performed, bringing the PA in front of the aorta. The aorta is then sutured onto the old PA root (now "neoaortic" root). The right and left coronary arteries are removed from the old aortic root. The coronary arteries are then sewn onto the newly constructed "neoaortic" root. A piece of the patient's own pericardium (sac surrounding the heart) is used to reconstruct the old aortic root (now "neopulmonary" root) where the coronary arteries were removed. The PAs are then reconnected to the "neopulmonary" root, completing the arterial switch portion of the operation.

For the atrial switch portion of the operation, a Mustard, or "hemi-Mustard" is done. In this procedure, the right atrium (upper chamber) of the heart is opened. Atrial septum (tissue between the right and left upper chambers of the heart) is removed. A patch of tissue, often of bovine (cow) pericardium is used to tunnel blood flow from the inferior and superior vena cava (veins that return blue blood to the heart) through the tricuspid valve, so that it can travel to the morphologic RV and out to the lungs. In a hemi-Mustard, a bidirectional Glenn shunt (see BDG) is also done, so that only inferior vena cava blood needs to be baffled to the tricuspid valve. Once the baffle is completed, the deoxygenated blood will flow to the RV and the oxygenated blood flows to the LV. The procedure then gives the majority of work for the ventricles back to the LV, which was designed for such a purpose.

Typical Post-Operative Course:

- Surgery Length: 6 hours
- Typical Lines: Most children will return to the Cardiovascular Care Center after surgery with a breathing tube, an arterial line to monitor blood pressure, a central venous line (for giving IV medicines and drawing labs), a peripheral IV, chest tubes to drain fluid, a Foley catheter to drain urine, and temporary pacemaker wires.

Double Switch Operation (Arterial + Atrial Switch)

- Typical Post-Operative Recovery: The breathing tube is usually removed in the first few day or two following surgery. The arterial line is usually removed within a few days, once most IV medicines are stopped. The central venous line is removed once most IV medicines are stopped and labs no longer need to be drawn. Chest tubes are usually removed 24-48 hours following surgery, once the output of fluid is minimal. Depending on the surgical plan, the patient may be placed on aspirin for a period of time following surgery.
- Typical Length of Stay: A child usually stays in the hospital for 10 –14 days following a double switch operation.

Typical Home Medications: Children will require one or more medications at home following a double switch operation such as:

- Diuretics (Lasix) to control fluid
- Anticoagulation (Aspirin) to prevent clotting
- Afterload reduction to ease the workload of the heart and lower blood pressure (Enalapril, Captopril)