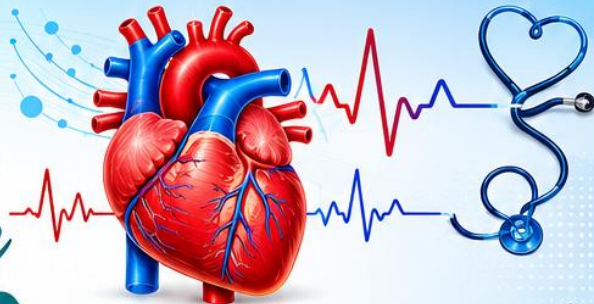




Single Ventricle Heart Disease



Types, Physiology & Surgical Management

What is Single Ventricle Heart Disease?

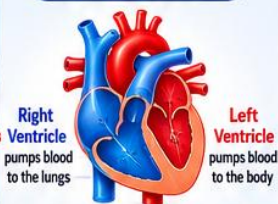
A group of complex congenital heart defects in which only one ventricle can effectively pump blood. These conditions require specialized lifelong care and staged surgery.



Types of Single Ventricle Defects

- 1 Hypoplastic Left Heart Syndrome (HLHS)**
 - Underdeveloped left ventricle
 - Requires Norwood → Glenn → Fontan pathway
- 2 Tricuspid Atresia**
 - Absent tricuspid valve
 - Hypoplastic right ventricle
- 3 Double Inlet Left Ventricle (DILV)**
 - Both AV valves enter one ventricle
 - Mixing of blood
- 4 Pulmonary Atresia with Intact Ventricular Septum**
 - No connection to pulmonary artery
 - Pulmonary blood flow often depends on PDA
- 5 Unbalanced AV Canal Defect**
 - One ventricle too small
 - Often treated with Fontan palliation

Normal Heart (Two Ventricles)



Single Ventricle Heart

- ✓ Blood mixing (oxygen-rich & oxygen-poor blood)
- ✓ One ventricle pumps to both lungs and body
- ✓ May cause cyanosis, heart failure, poor growth & exercise intolerance



STAGED SURGICAL MANAGEMENT

1 Stage 1: Neonatal Palliation

Goal: Stabilize circulation

- ✓ Norwood Procedure
- ✓ PDA Stenting
- ✓ BT Shunt
- ✓ Pulmonary Artery Banding



2 Stage 2: Bidirectional Glenn (3 – 6 months)

- ✓ Connects SVC to Pulmonary Arteries
- ✓ Reduces workload on ventricle
- ✓ Improves oxygen saturation



3 Stage 3: Fontan Procedure (2 – 5 years)

- ✓ Routes IVC blood to Pulmonary Arteries
- ✓ Creates Fontan circulation
- ✓ Single ventricle pumps only to the body



Long-Term Follow-Up & Lifelong Care

- | | |
|----------------------|---------------------------------|
| Ventricular Function | Thromboembolism Risk |
| Arrhythmias | Fontan-Associated Liver Disease |
| Exercise Capacity | Growth & Neurodevelopment |

Key Takeaway

Early diagnosis, staged surgical palliation, and lifelong specialized follow-up have dramatically improved survival and quality of life for children born with single ventricle heart disease.



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