

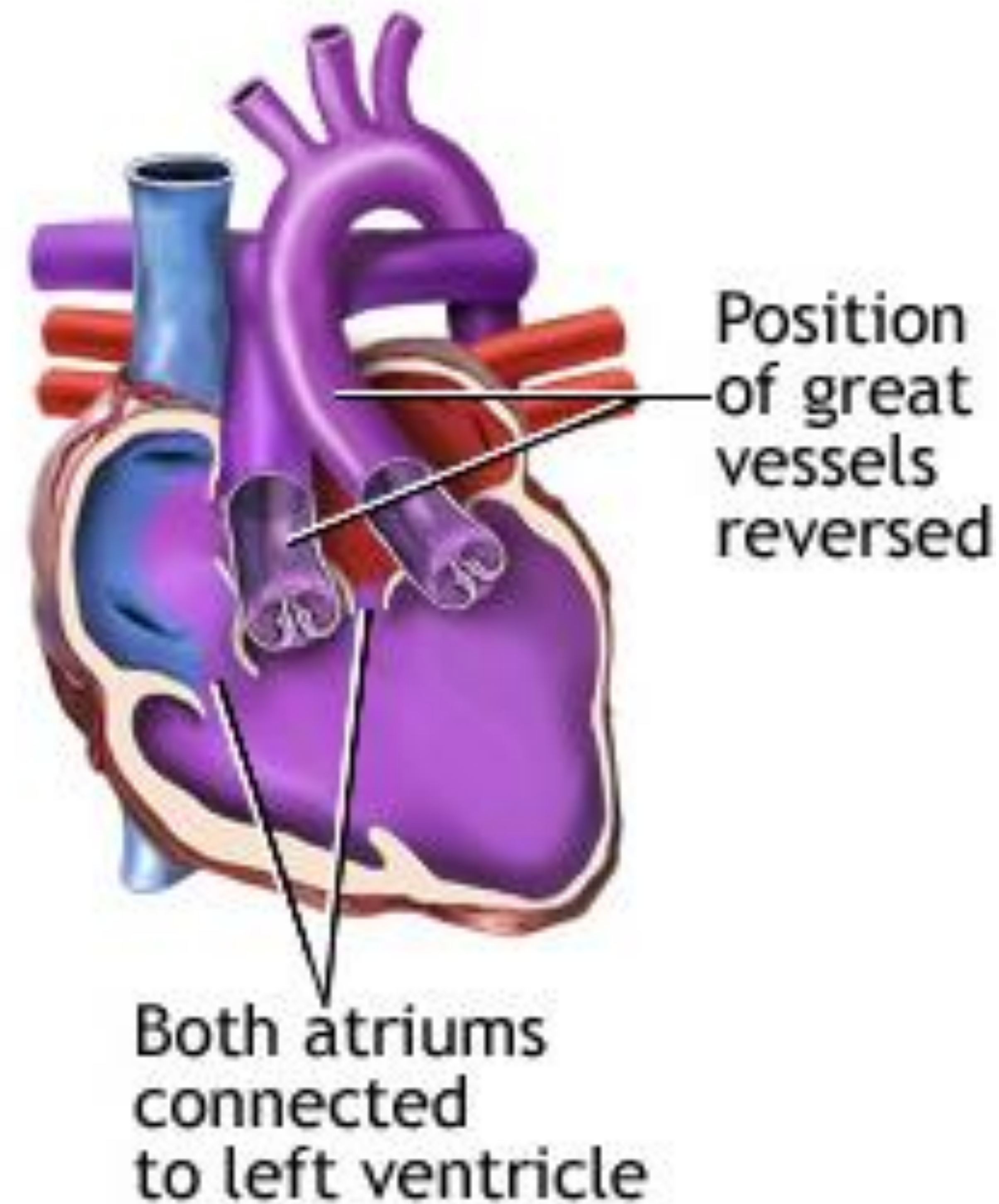
Labor Analgesia in Patient with Fontan Circulation

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Clinical Case – Extracardiac Fontan 2/2 Double Inlet LV

- 24F G1 @ 33w6d
- CC: Worsening Chest Pains & Dyspnea

Double inlet left ventricle



ADAM.

Epidural:

- 1mg IV midazolam
- DPE (27g Whitacre)
- Starting Infusion: 0.0625% Bupivacaine + Fentanyl 2mcg/cc @ 8cc/hour

Hours Since Epidural	Epidural Infusion	Continuous Rate	PCEA
1st Hour	0.0625% Bupivacaine + 2mcg/cc Fentanyl	8 cc/hr	None
2nd	0.0625% Bupivacaine + 2mcg/cc Fentanyl	10 cc/hr	3cc Q10min
20th	0.1% Bupivacaine + 2mcg/cc Fentanyl	10 cc/hr	3cc Q10 min

- 23 Hrs – Unassisted Vaginal Delivery
 - 800cc Blood Loss
 - 10 units IM Oxytocin & 800mg Buccal Misoprostol
- 1st Hour monitoring:
 - BP, Rhythm, HR

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Fontan Physiology & Pregnancy

Dependent on passive pulmonary circulation

- ↑ CVP drives flow

Chronic ↑ CVP

- Liver Dx
- Kidney Dx
- Protein Losing Enteropathy
- Plastic Bronchitis

Rychik J. et al. Circulation. 2022 Dec 13;146(24):e334-e482

Special Concerns:

- Miscarriage rates ~ 50%
- Heritability of congenital heart disease
- Thrombosis
- Post-partum hemorrhage
 - Avoid Methergine & Carboprost
- ↑ Pulmonary Vascular Resistance (PVR)

Monteiro, RS. Int J Obstet Anesth. 2016 Dec;28:83-91

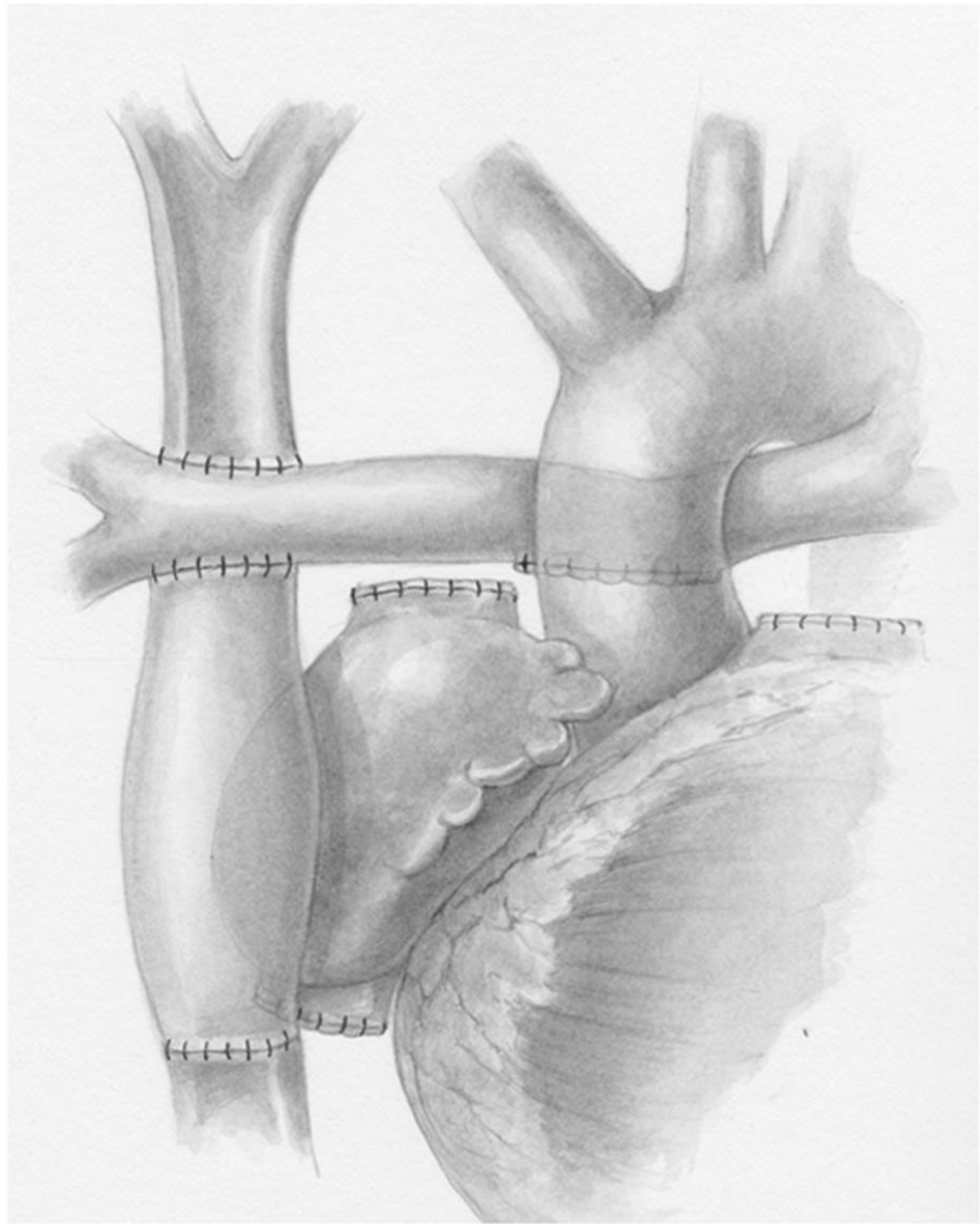
Pregnancy Hemodynamic Δ s

- Plasma Volume ↑ 45%
 - ↑ Risk Arrhythmia
 - ↑ Risk – Heart Failure
- Cardiac Output ↑ 60-80% @ Delivery

Sanghavi S & Rutherford JD. Circulation. 2014 Sep 16;130(12):1003-8

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Fontan Anesthesia Goals



Extracardiac Fontan

Kogon B.Circulation. 2012 Nov 20;126(21):2511-5

Goals	Actions
Keep Pulmonary Vascular Resistance Low	Avoid Hypercarbia
	Avoid Hypoxia
	Avoid Acidosis
	Avoid Hypothermia
	Avoid high intrathoracic pressure
	Pulmonary vasodilators (sildenafil, bosentan, nitric oxide, ect.)
Maintain Sinus Rhythm	Adequate Analgesia
	Electrocardiogram Monitoring
	Pacemaker/ICD planning
Maintain Preload	Avoid Prolonged Fasting
	Left Uterine Displacement
	IV Fluids
Decrease Risk Embolism	Filters on IV tubings
	Sequential compression devices
	Anticoagulation/ anti-platelet agents when able
Adapted from McNamara JR et al. J Cardiothorac Vasc Anesth. 2022 Jan;36(1):275-285	
ICD = Implantable Cardioverter Defibrillator	