

ECMO & ECHO

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Cardiac Sonographer

2nd Annual Echo Lab Symposium
May 14, 2018

Extracorporeal

Outside of the body

Membrane

Lung

Oxygenation

Saturating blood with Oxygen

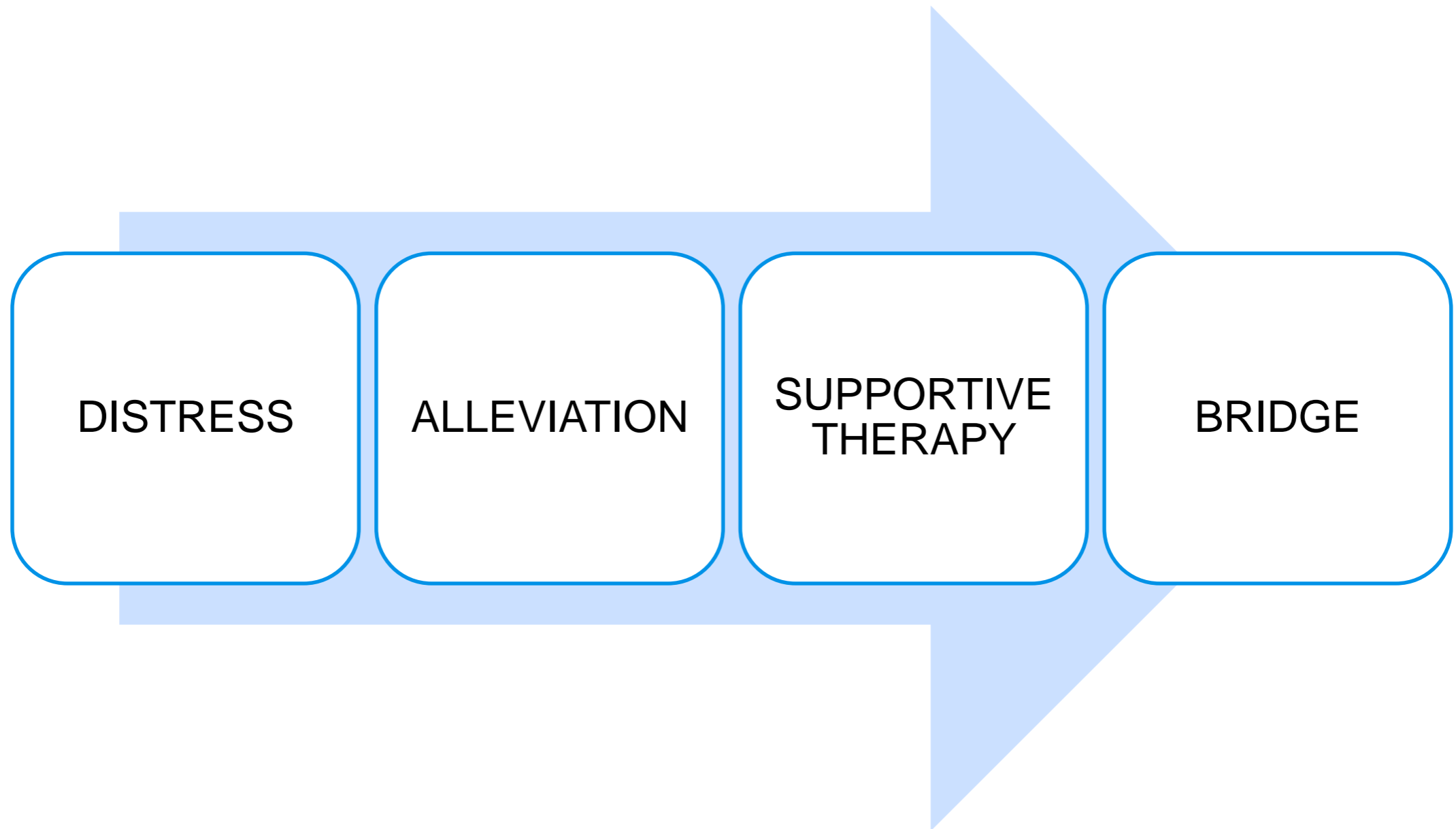
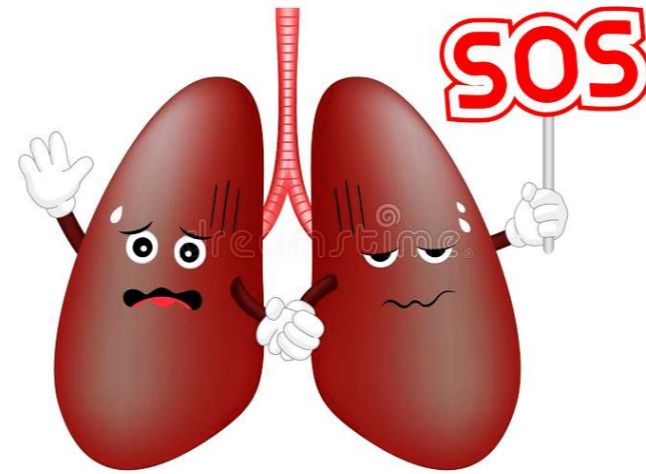
E

C

L

S

EXTRACORPOREAL LIFE SUPPORT



DISTRESS

ALLEVIATION

SUPPORTIVE
THERAPY

BRIDGE

Deoxygenated blood is removed from body
Oxygenated
CO2 Extracted
Oxygenated blood return to body

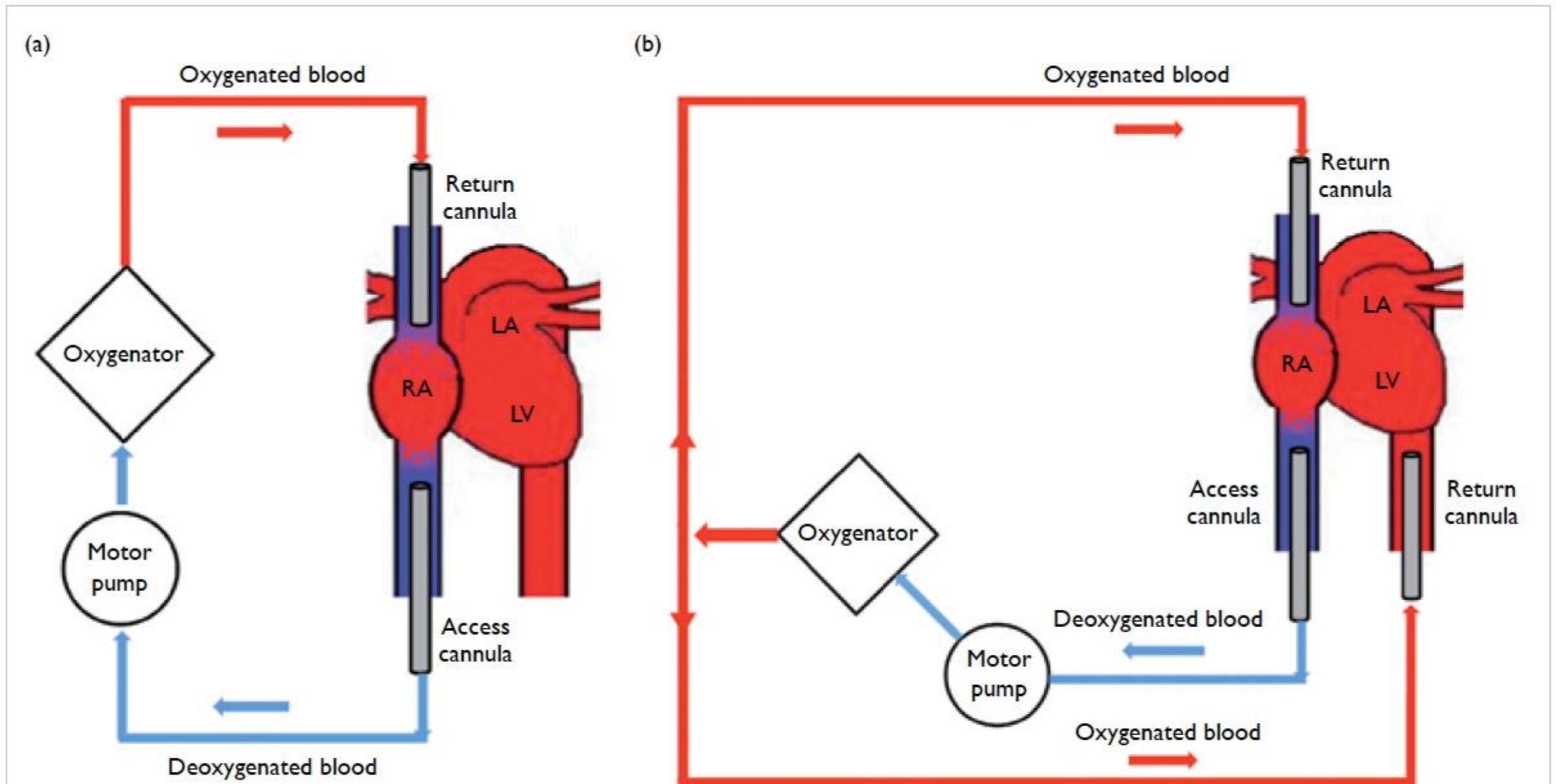


FIG 1. Venovenous extracorporeal membrane oxygenation (ECMO) configuration

(a) Venovenous and (b) veno-arterial-venous ECMO circuits

Abbreviations: LA = left atrium; LV = left ventricle; RA = right atrium

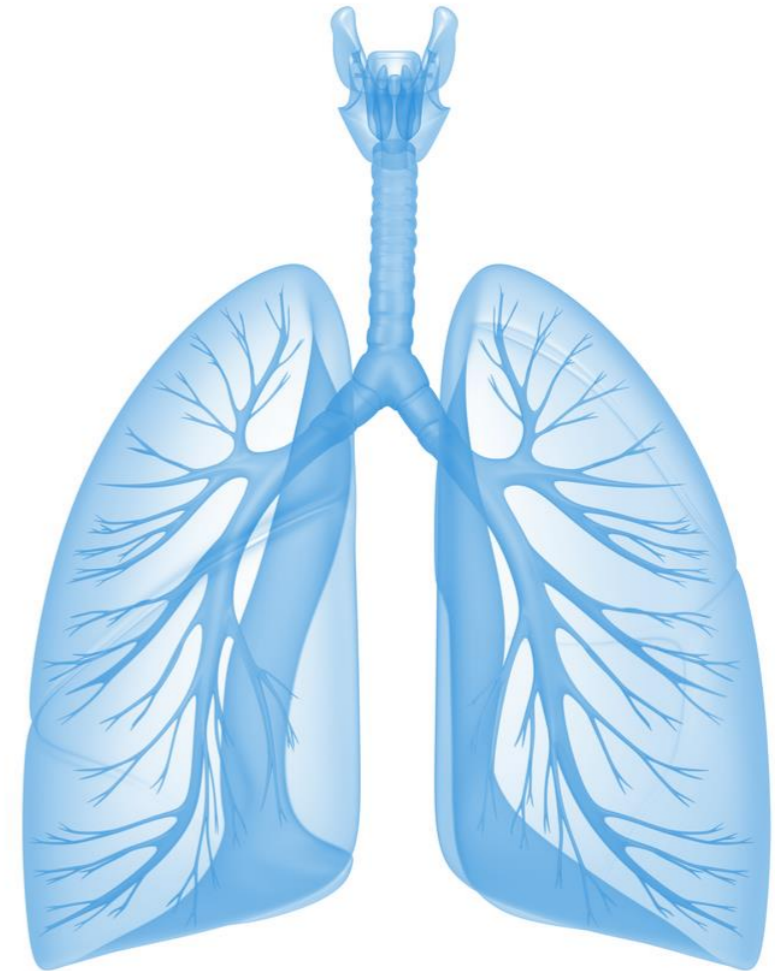
Indications for Venovenous Ecmo Support

Acute Respiratory Distress Syndrome

- Pneumonia
- Aspiration Syndrome
- Alveolar Proteinosis

Provide Lung Rest

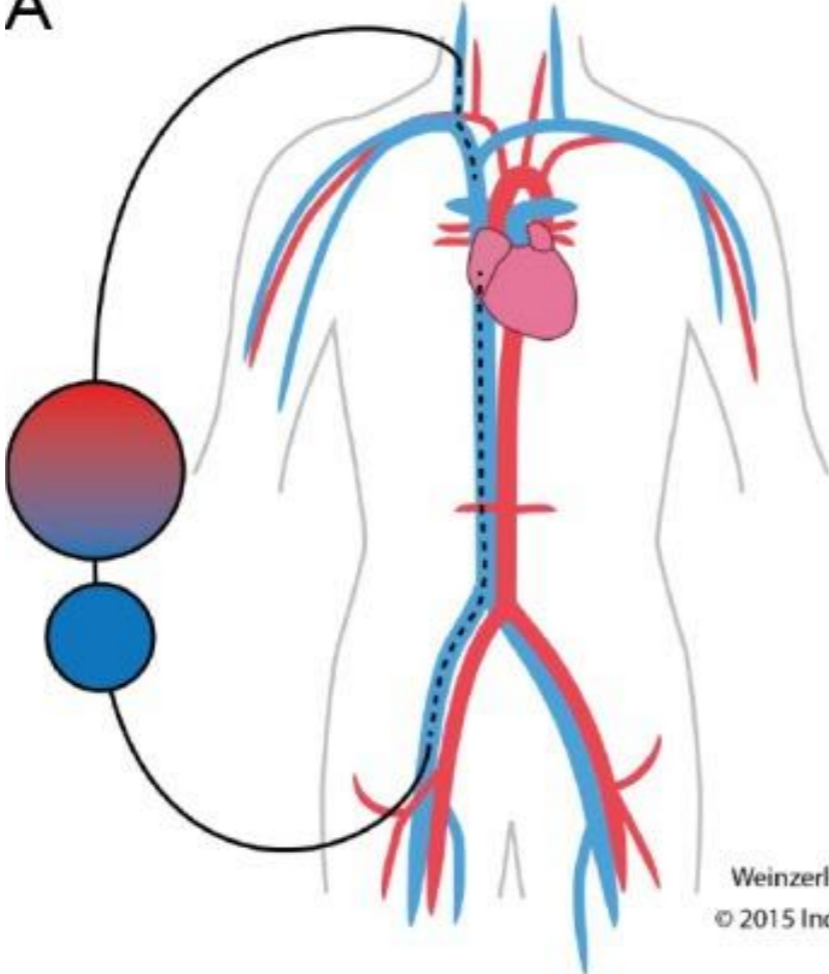
- Chronic Airway Obstruction
- Pulmonary Contusion
- Smoke Inhalation
- Lung Transplant
- Lung hyperinflation
- Congenital diaphragmatic hernia
- Meconium Aspiration



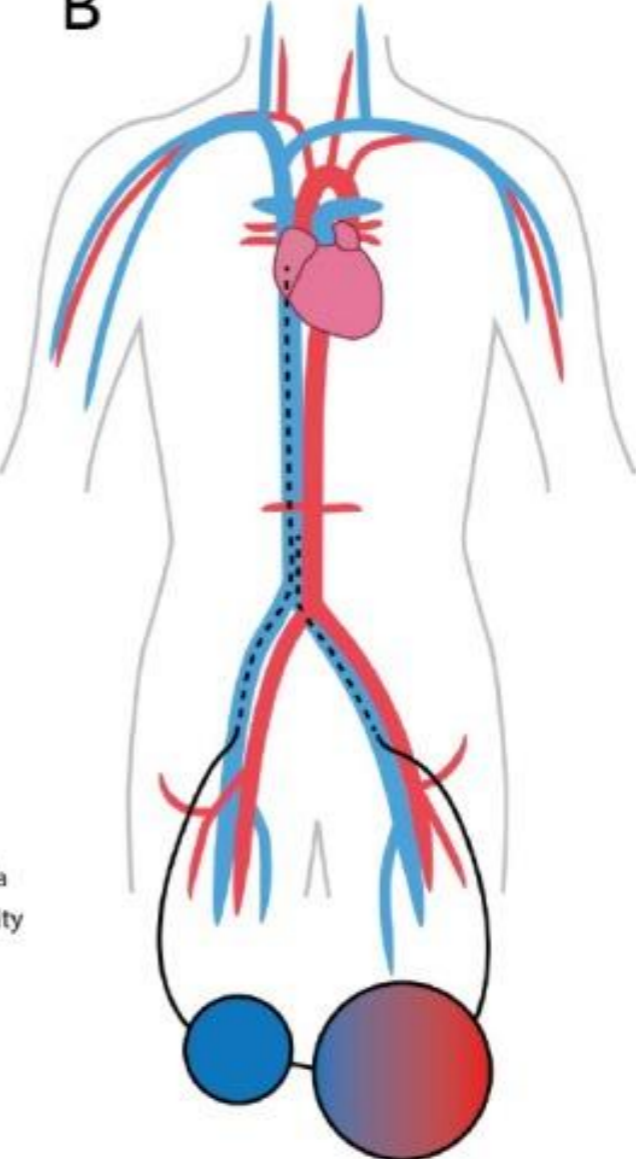
“VV ECMO”

Veno-venous ECMO: two cannulation approach

A

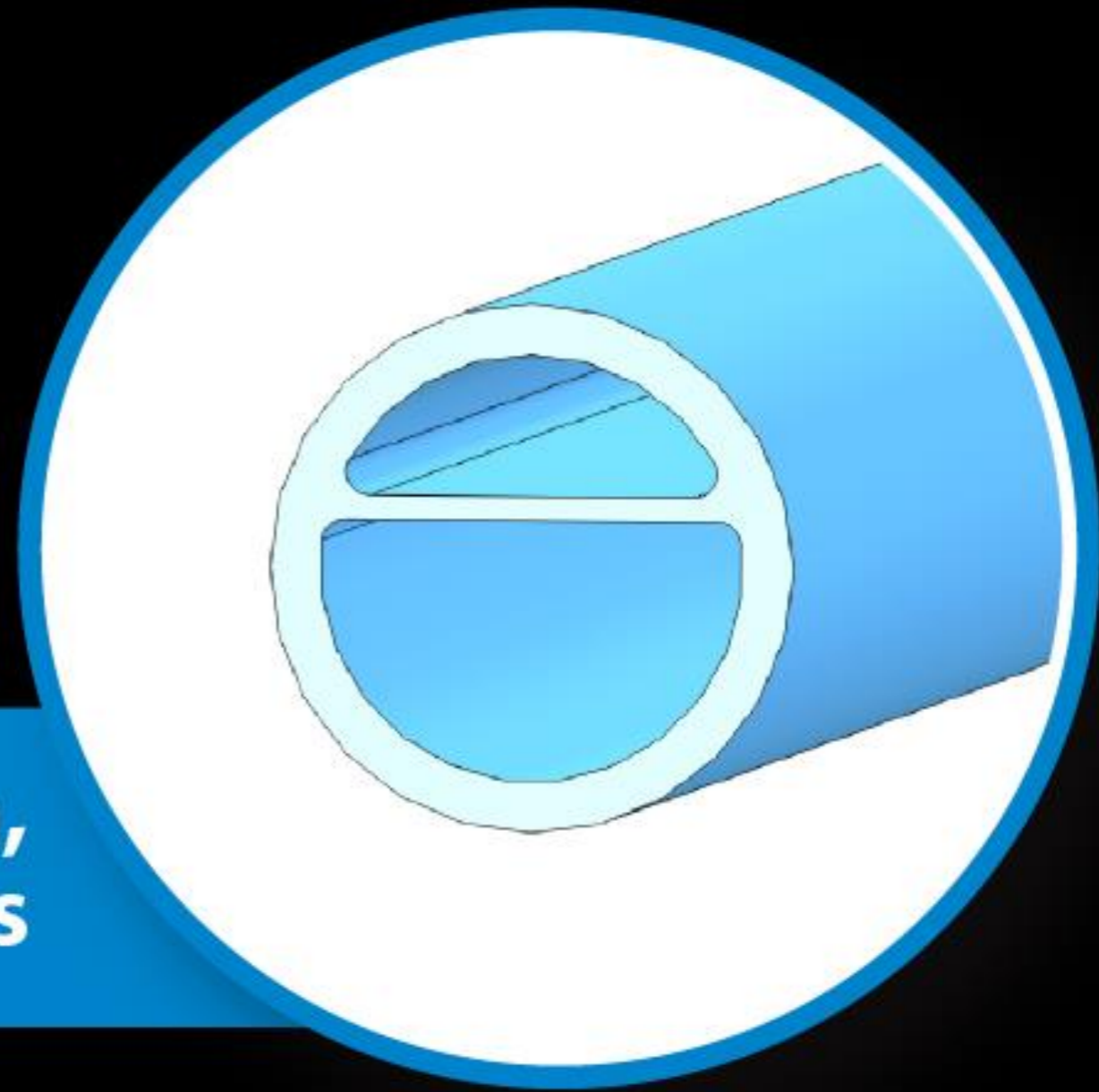


B

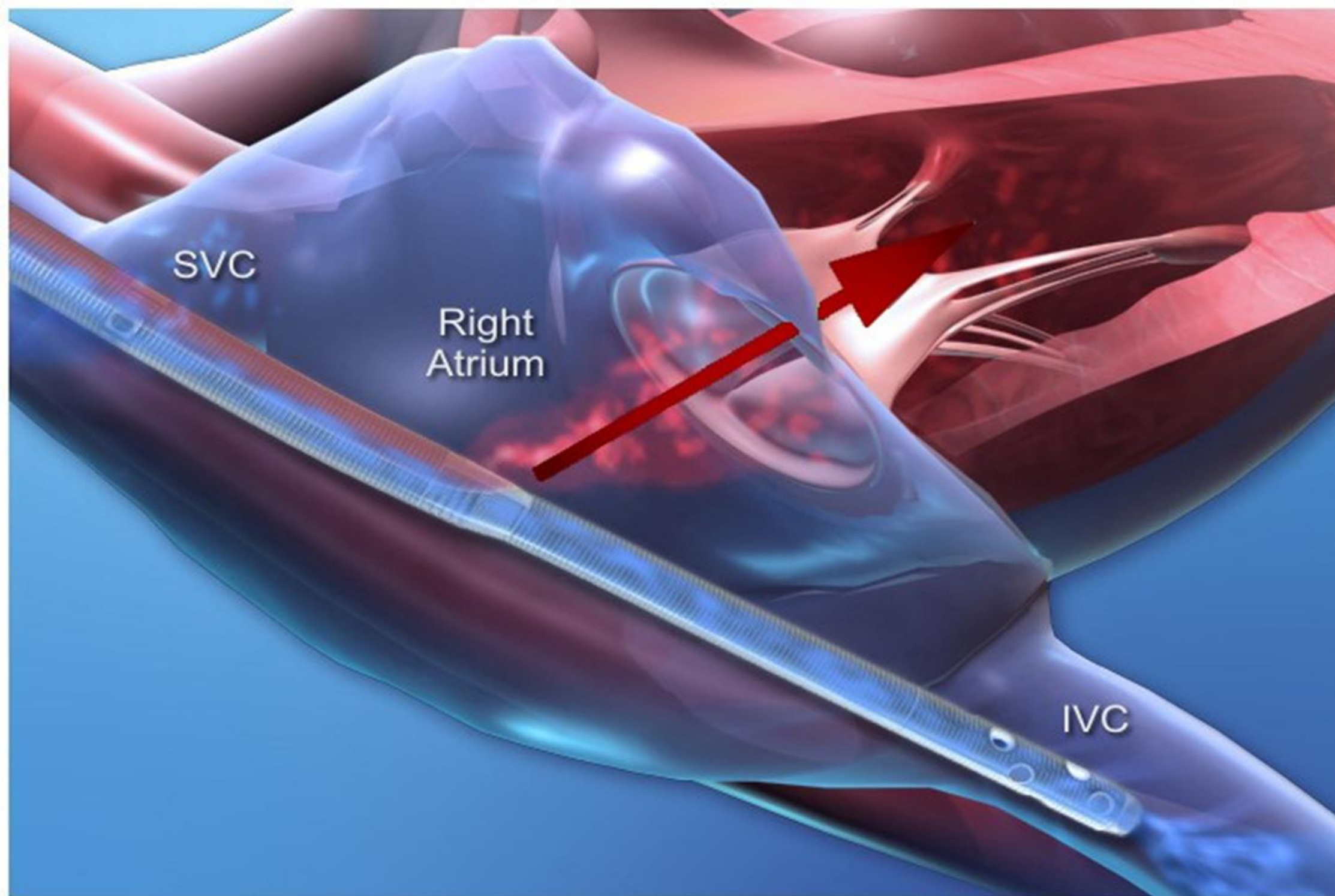


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Dual Lumen Cannula



**Separated return,
drain lumens**



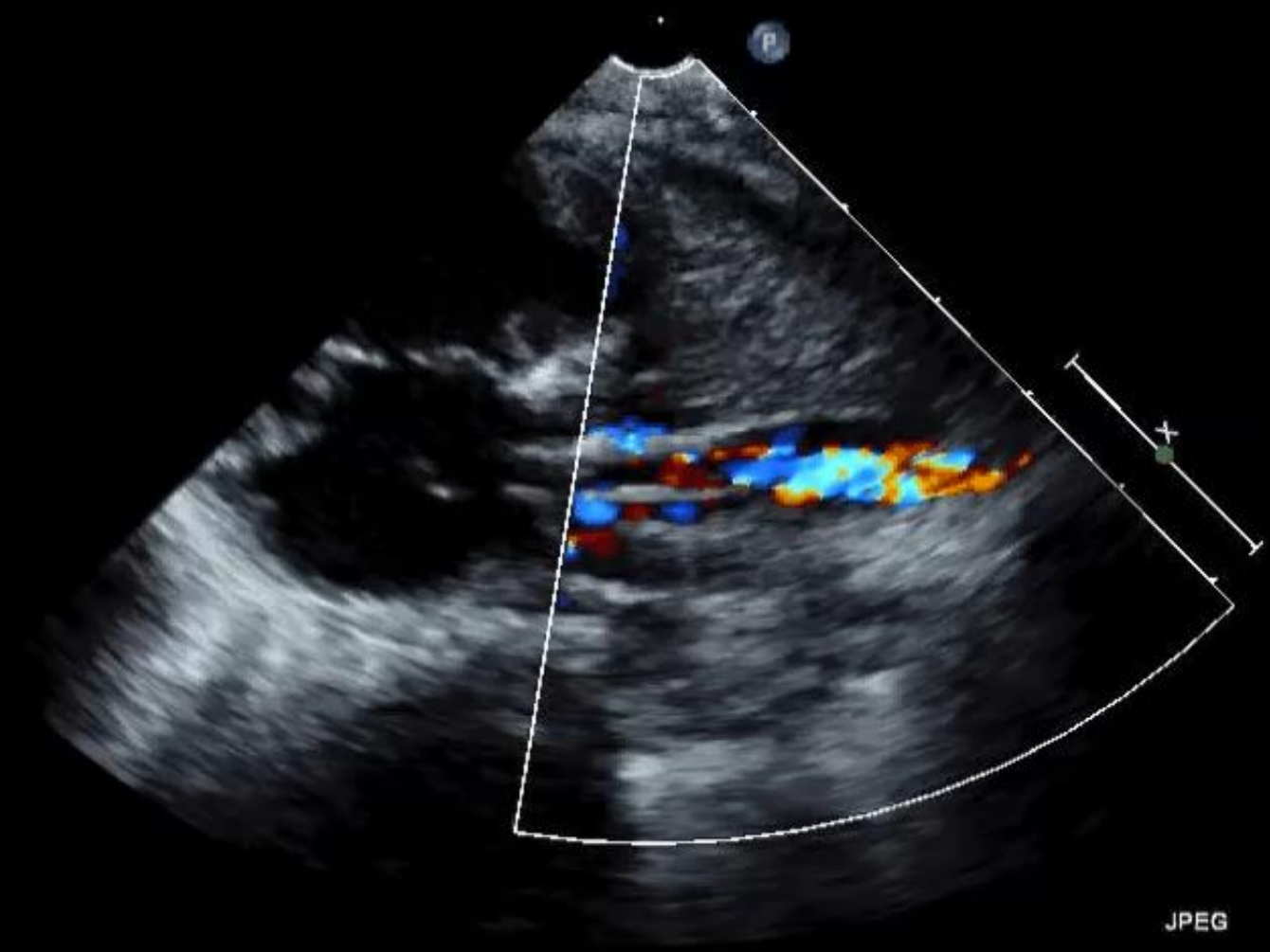


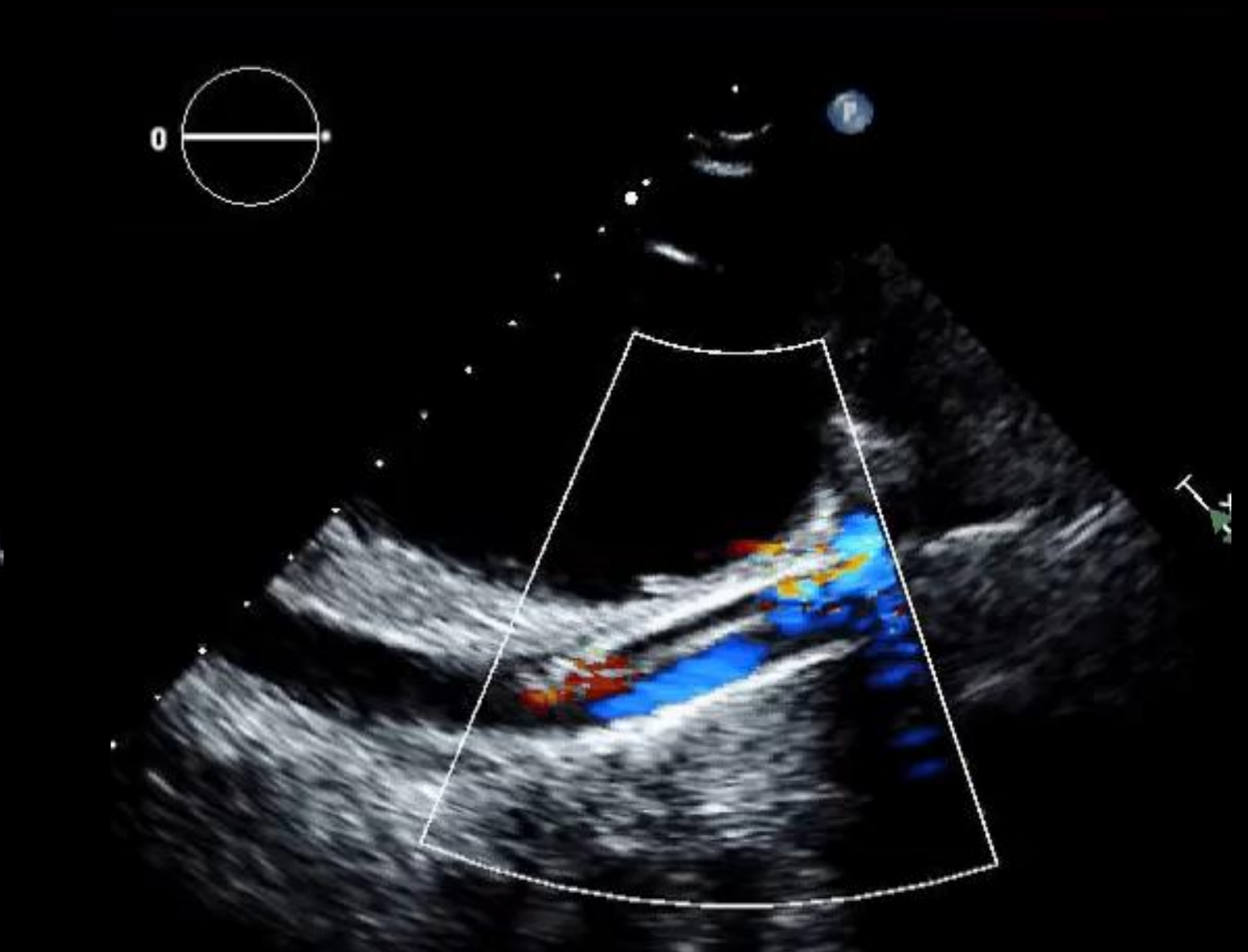
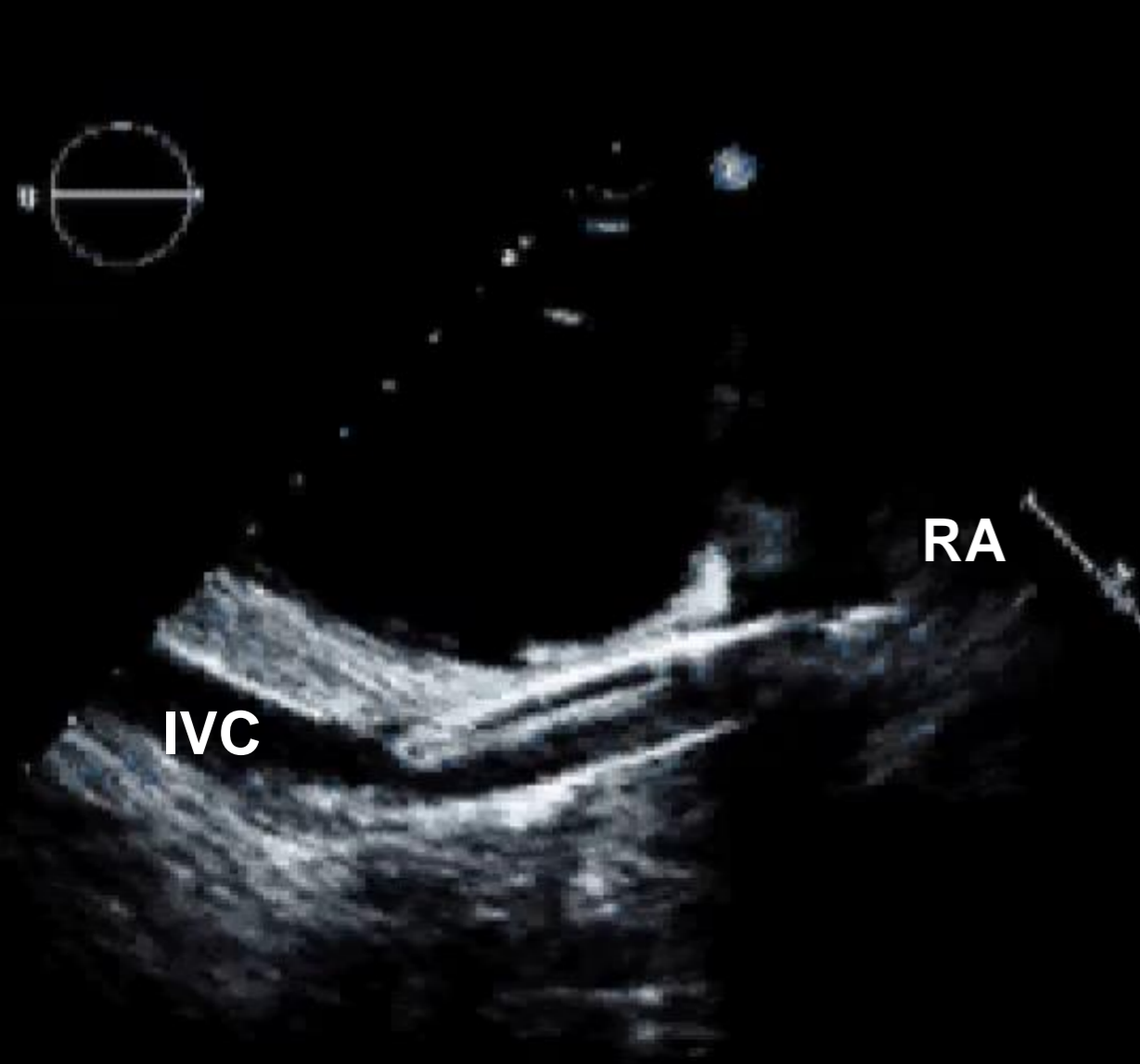
SVC

RA

IVC

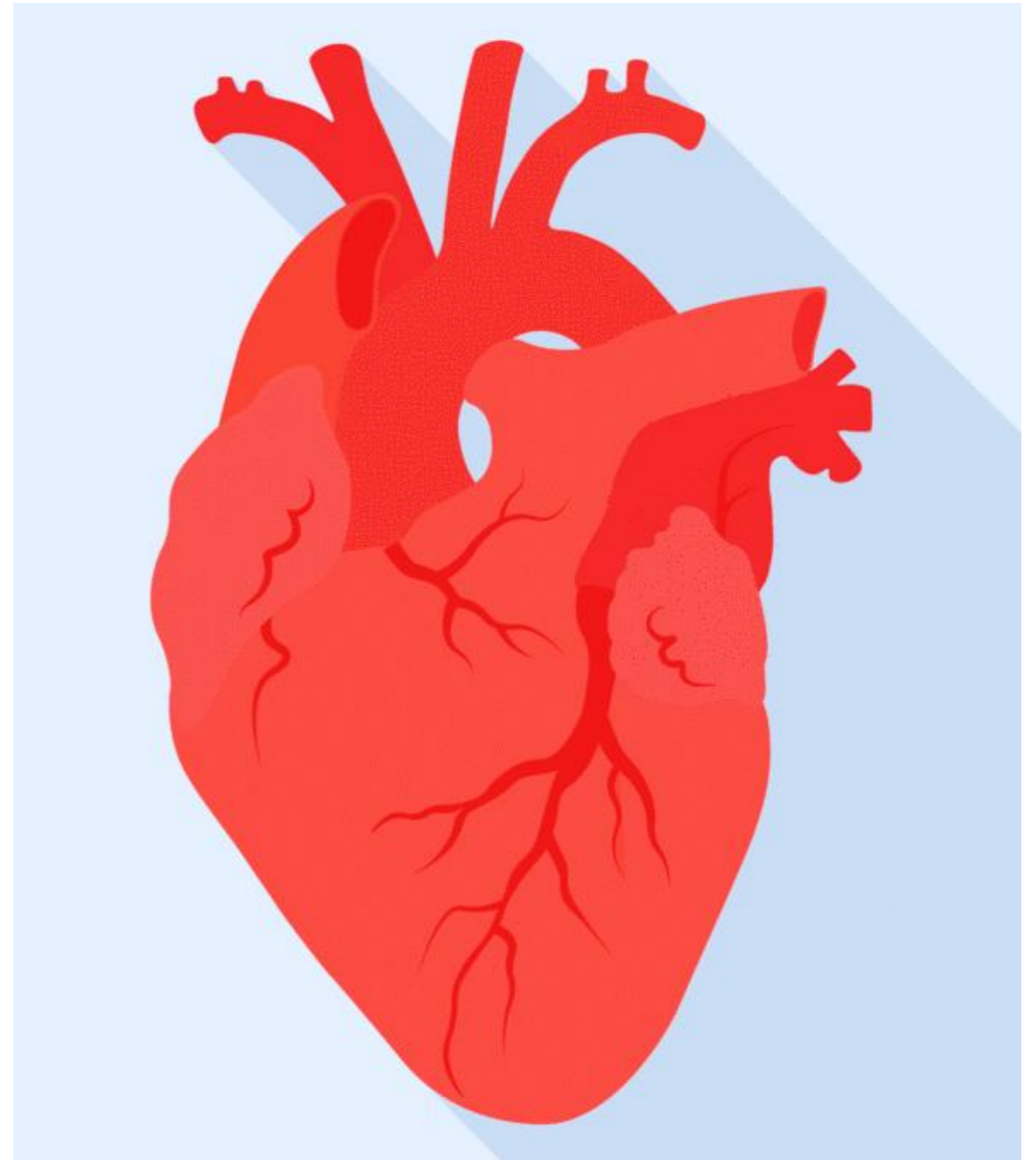
120





Indications for Venous Arterial (venous) Ecmo Support

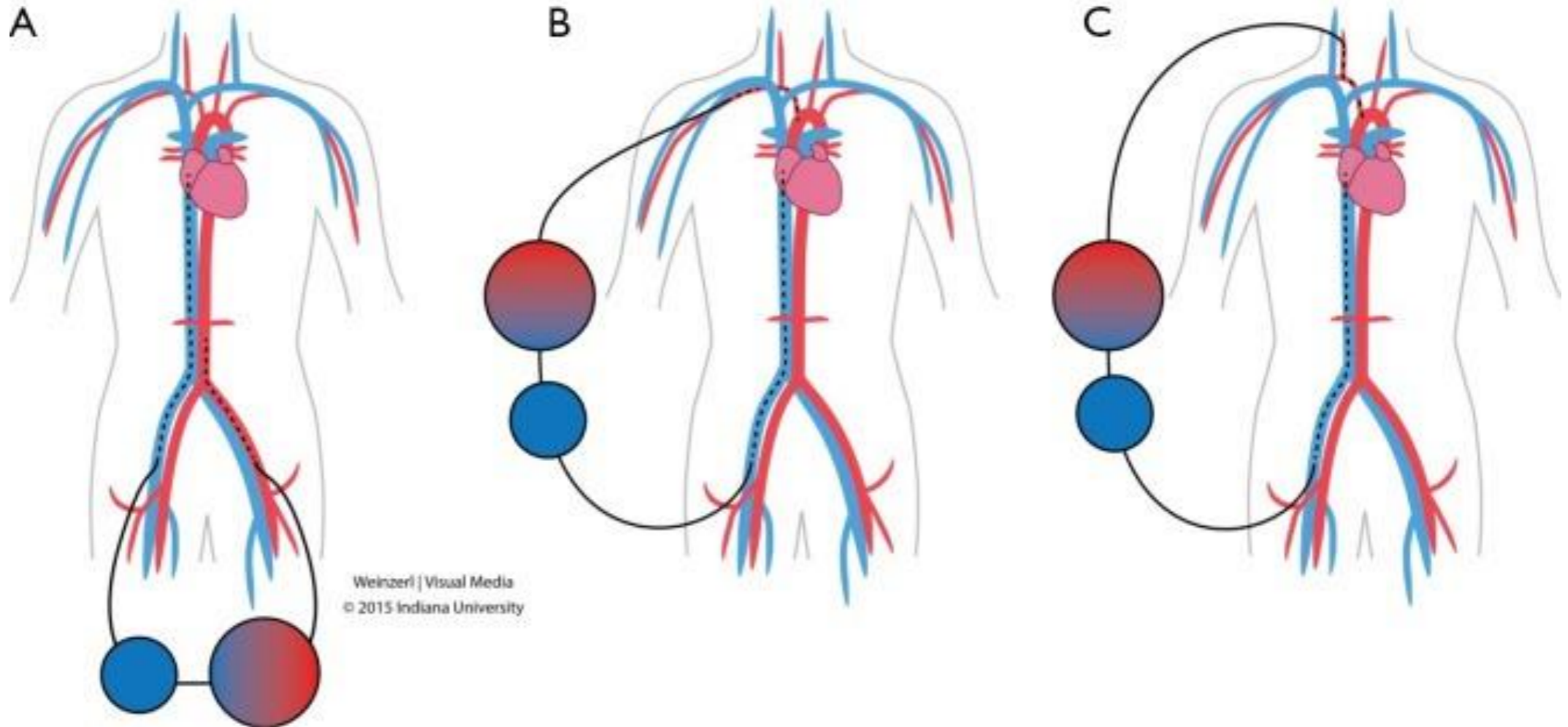
- Congenital heart disease
- Cardiogenic Shock
- Myocarditis
- Cardiac Trauma
- Inability to wean off cardiopulmonary bypass
- Cardiac Transplant
- Chronic cardiomyopathy
- Bridge



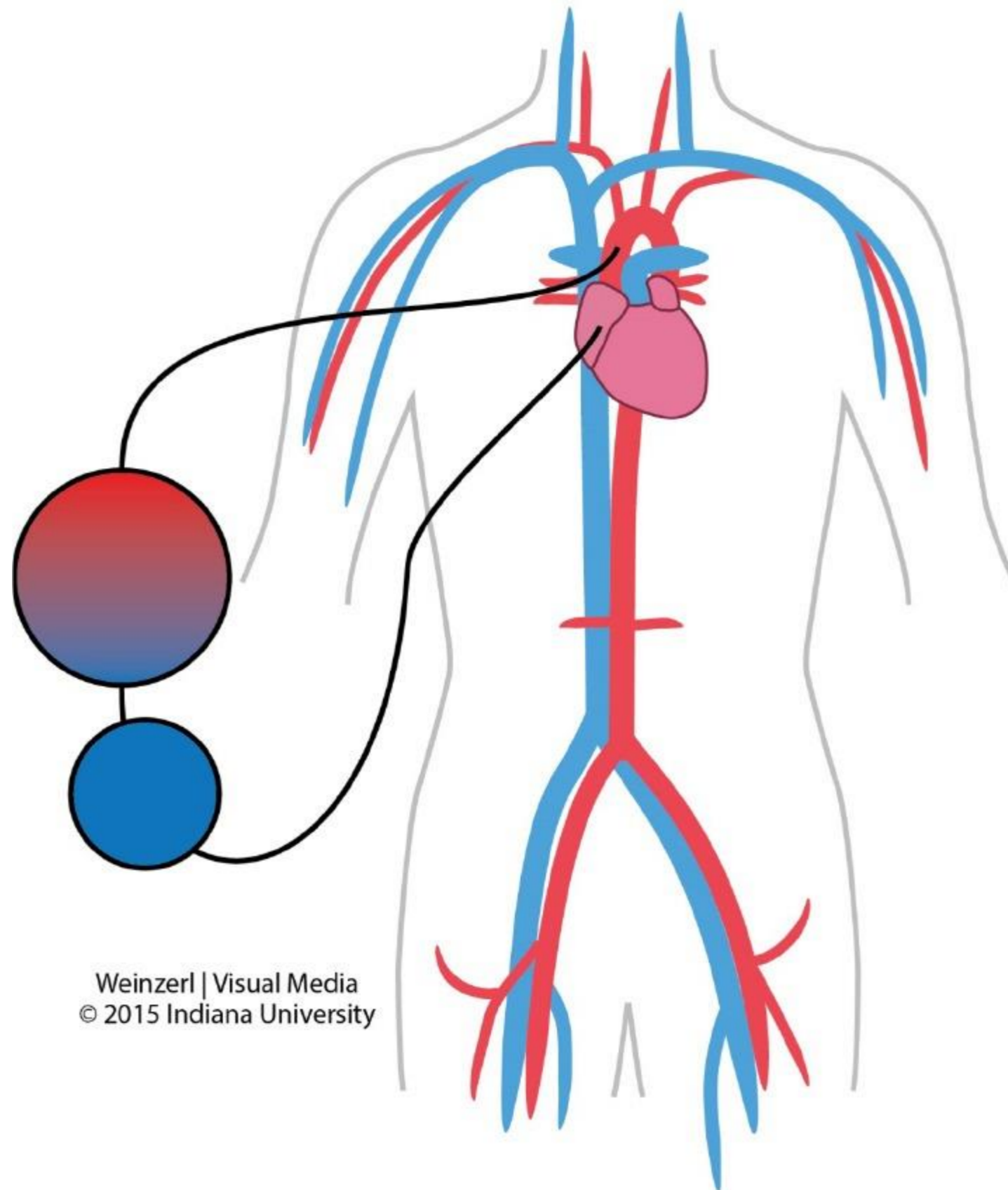
“VA ECMO”

“VAV ECMO”

Peripheral veno-arterial ECMO cannulation approach



Central veno-arterial ECMO cannulation approach



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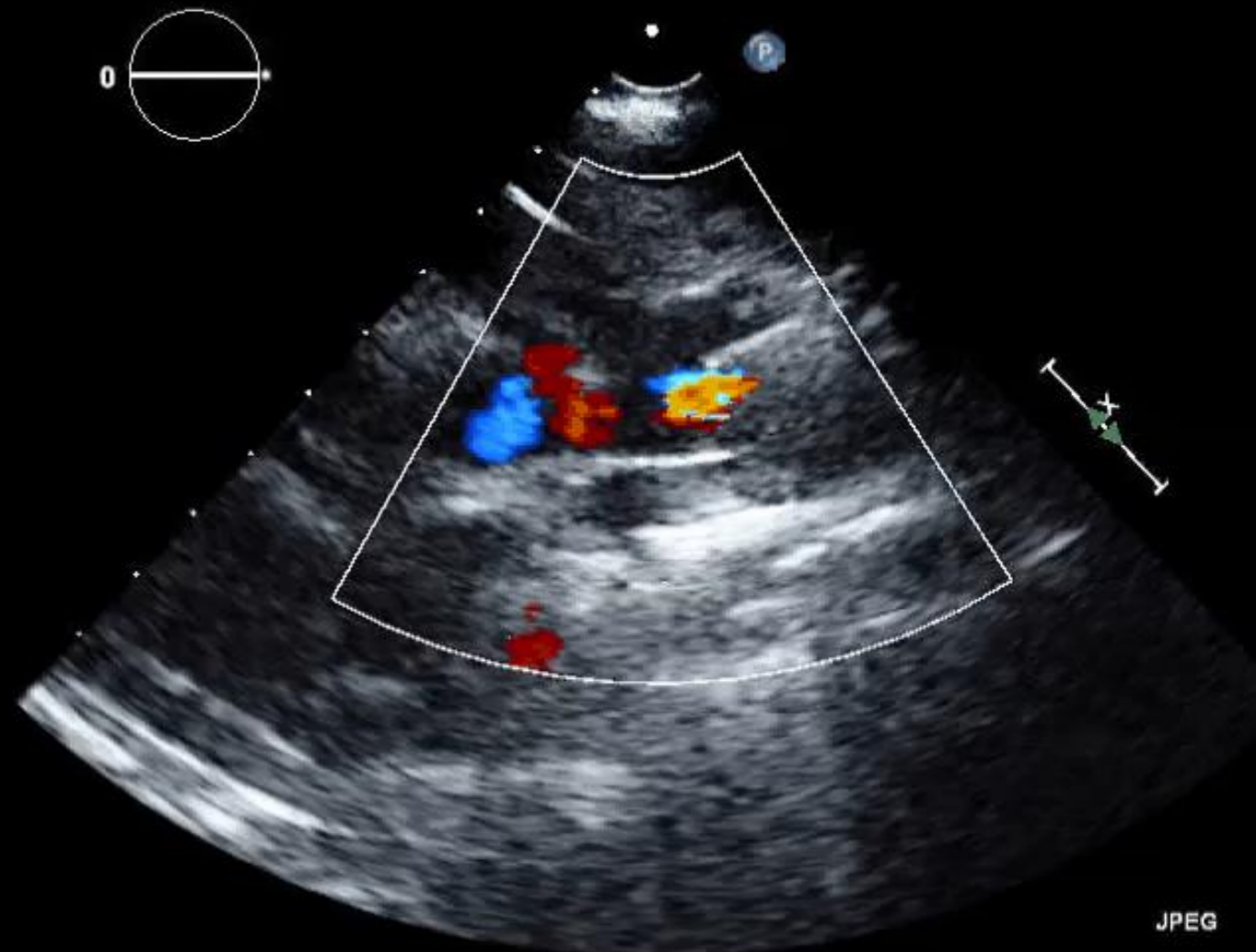
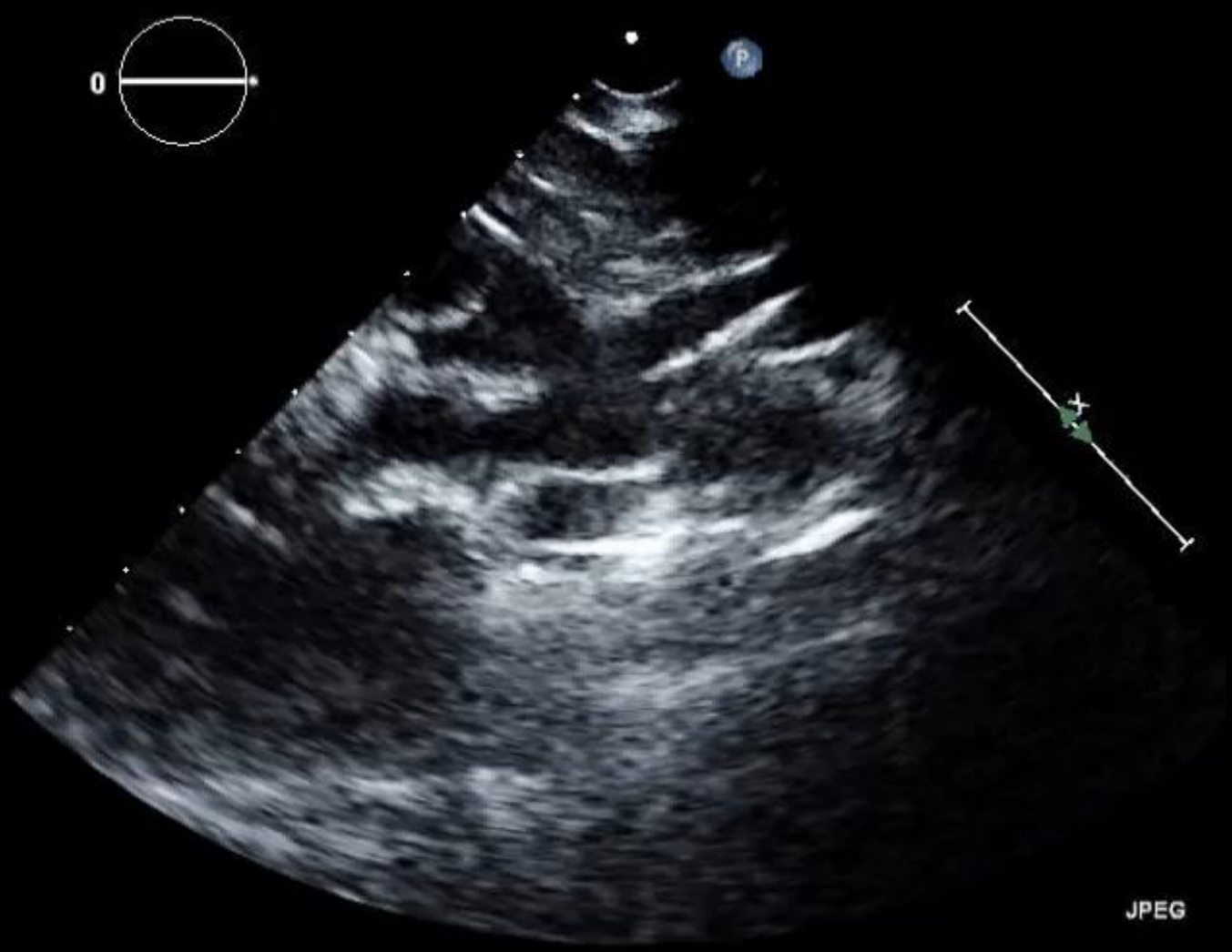
PAC 9/19/92
T00m

2D
7.1%
C 50
P Low
H180

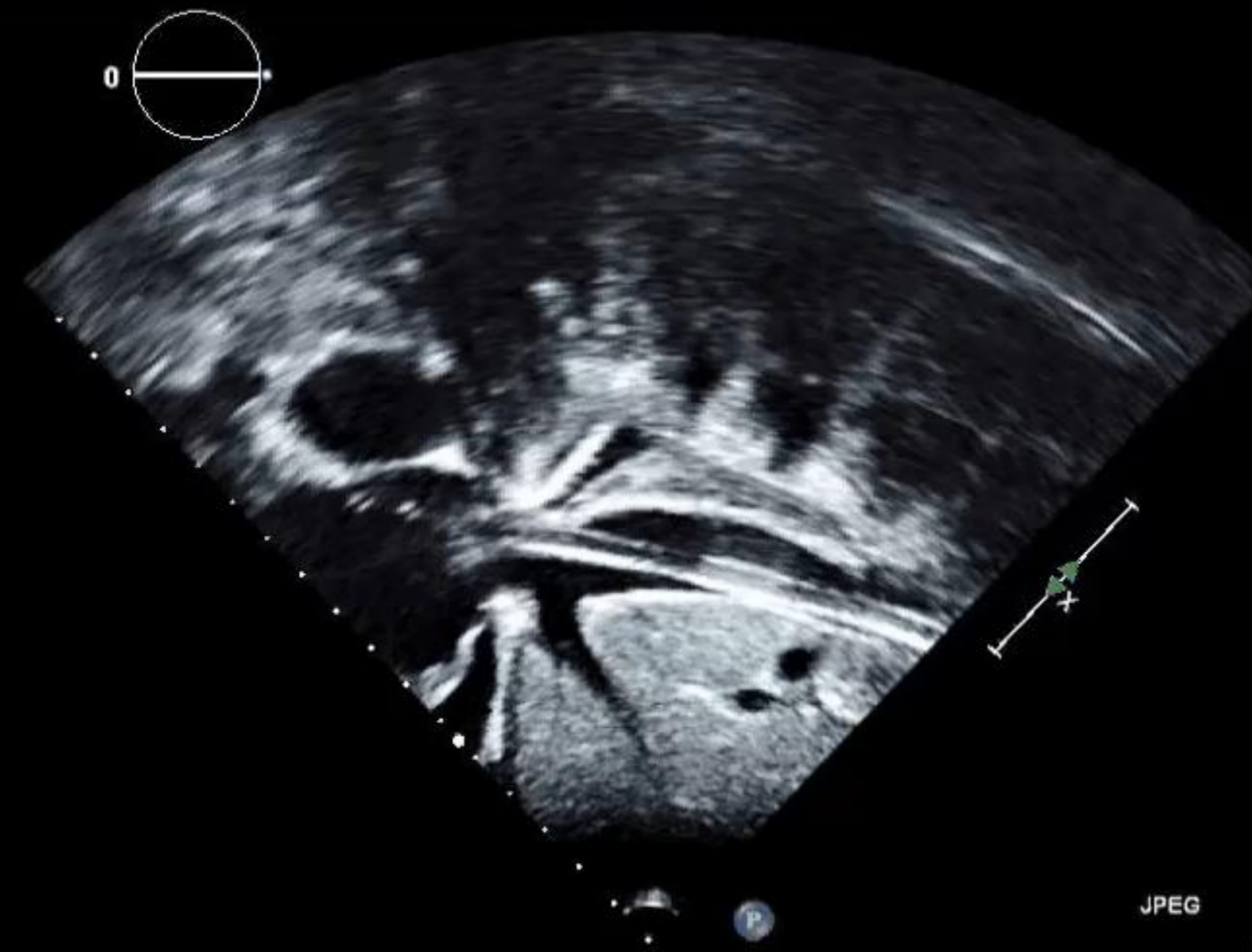


JPG

148 bpm

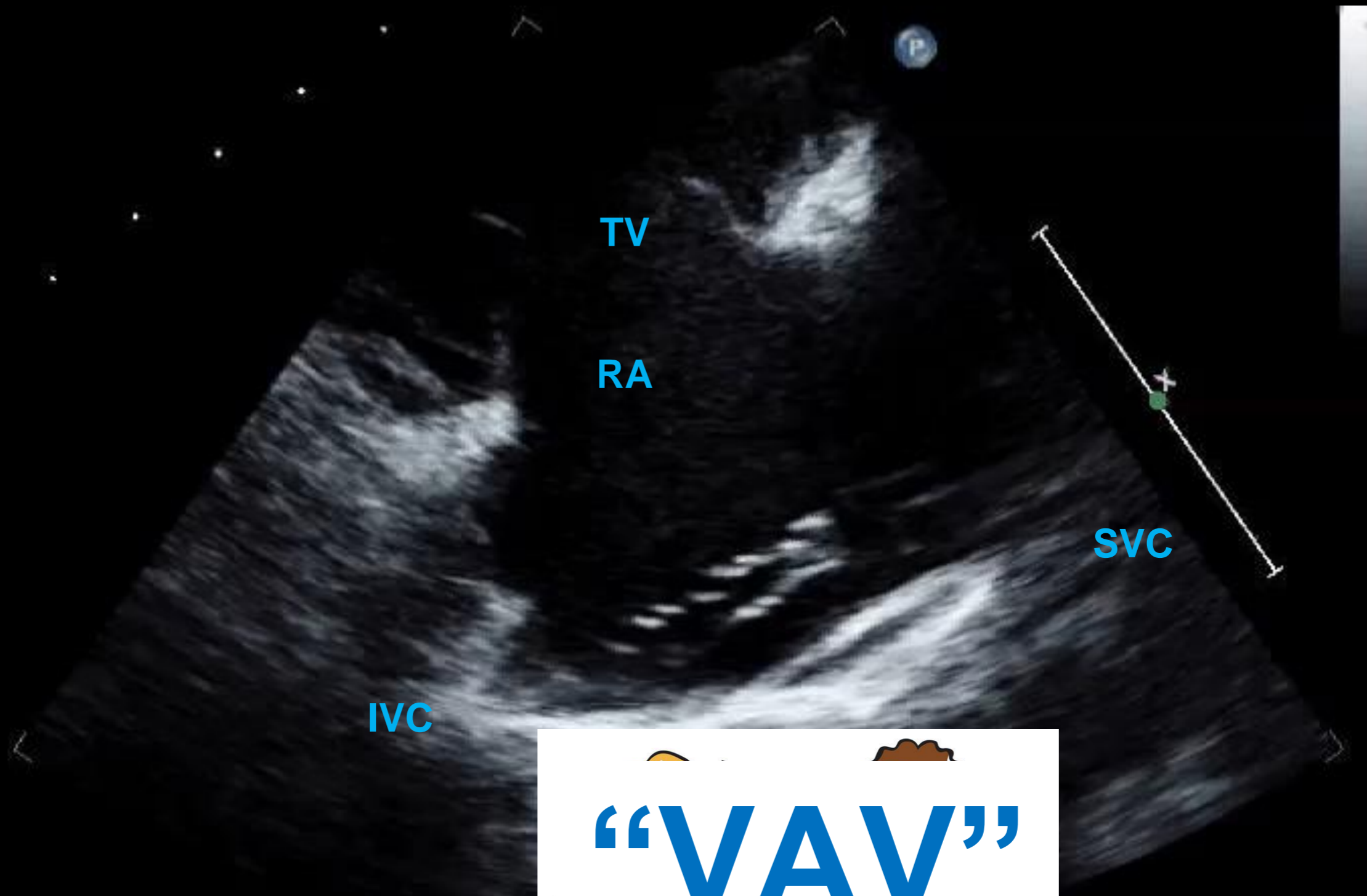


ARTERIAL CANNULA- AORTA



VENOUS CANNULA- SVC & IVC

2D
73%
C 50
P Low
HRes



JPEG

ACE
FPS: 58
AG(t): 7 dB

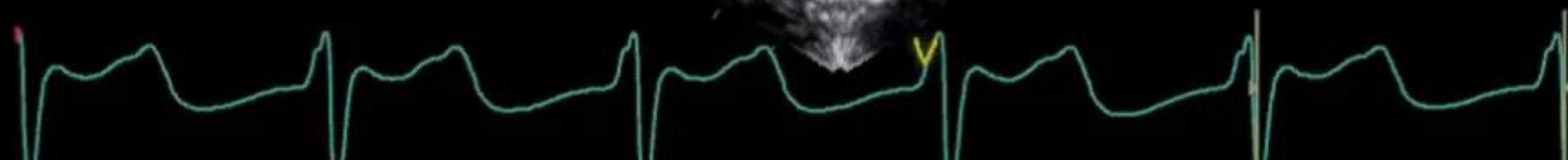
Soft



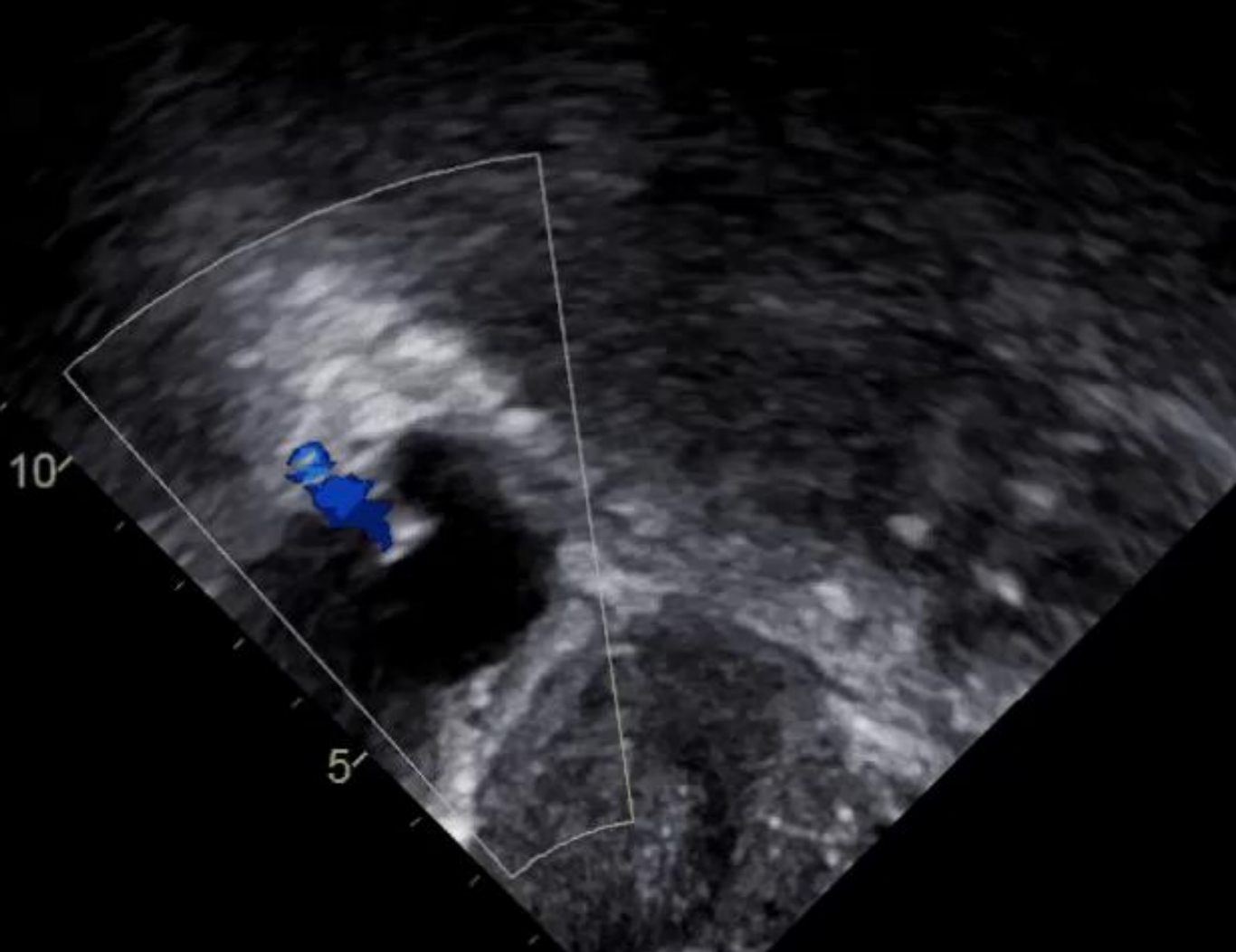
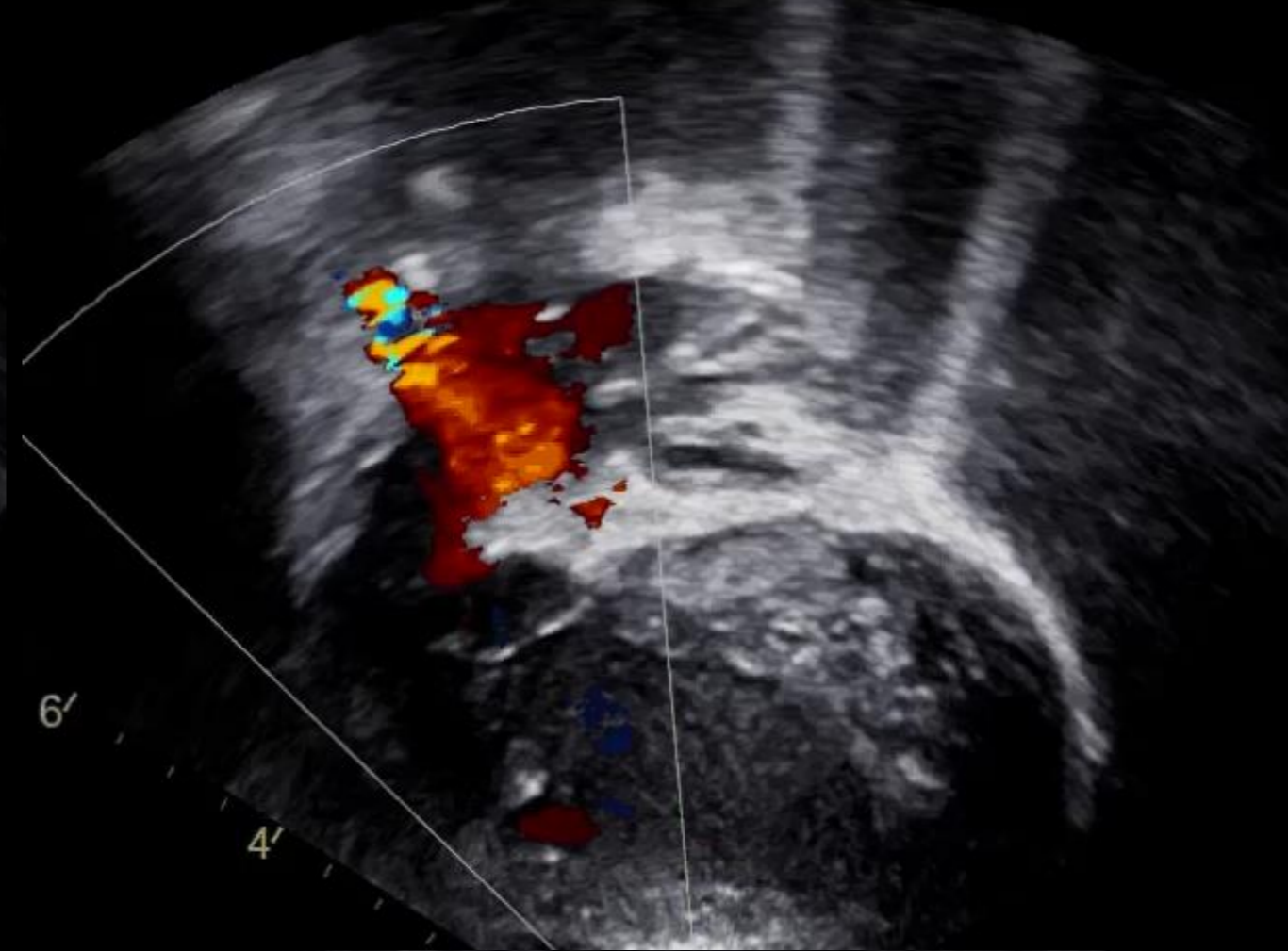
6'

4'

2'



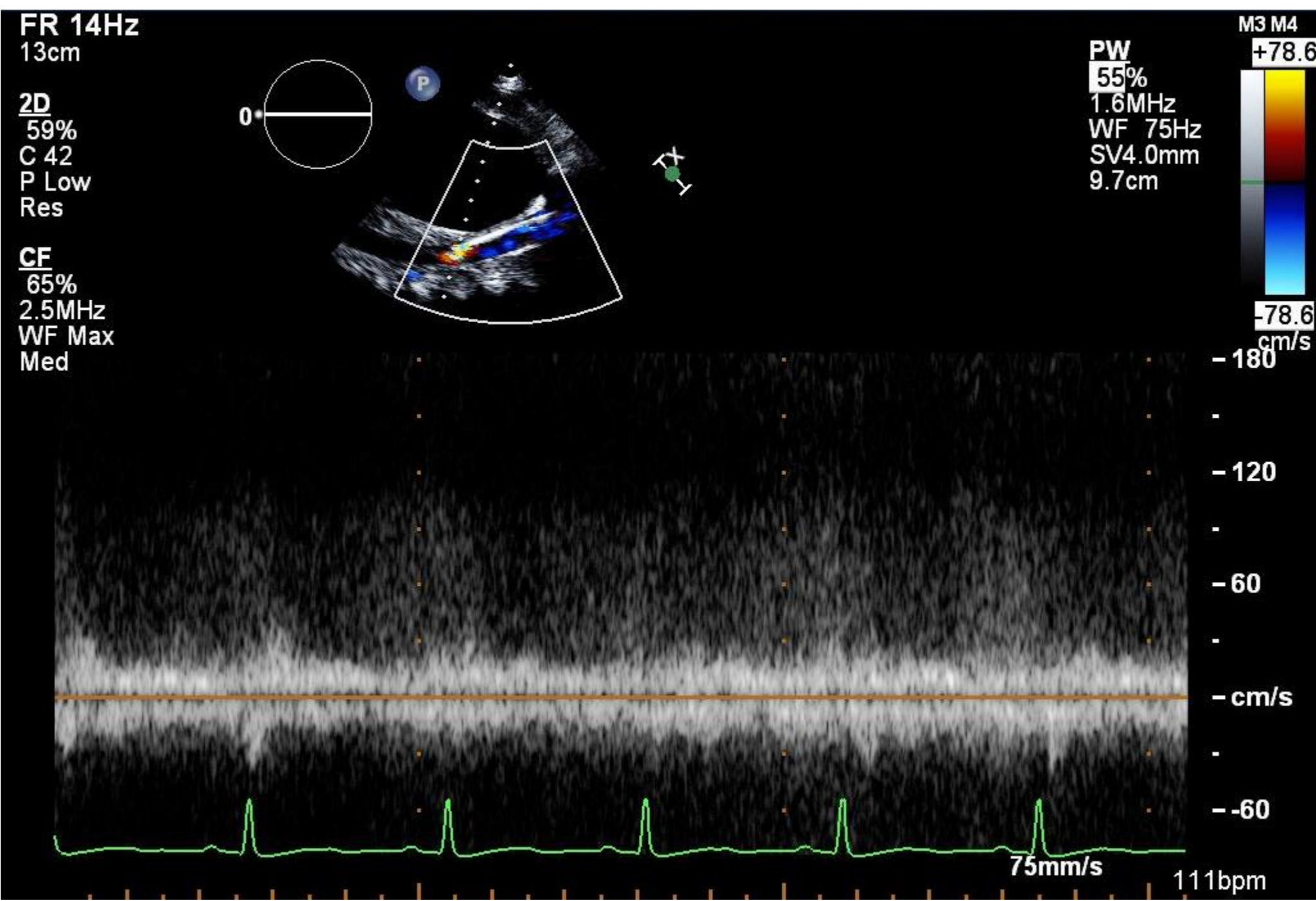
76
HR







JPEG



ECMO & ECHO Checklist

VA or VV?

Cannulation Sites?

Cannula Position: Too Short? Too Far?

Cannula Position: How is the flow?

Suspicious New Friends?

Cardiac Function?

Valve Regurgitation?

New Fluid accumulation?

Contraindications for ECMO

Absolute: among these futile treatment without exit strategy in case of

- o Unrecoverable heart and not a candidate for transplant or destination therapy of VAD support
- o Disseminated malignancy
- o Known severe brain injury
- o Unwitnessed cardiac arrest
- o Prolonged CPR without adequate tissue perfusion
- o Unrepaired aortic dissection
- o Severe aortic regurgitation
- o Severe chronic organ dysfunction (emphysema, cirrhosis, renal failure)
- o Compliance (financial, cognitive, psychiatric, or social limitations in patient without social support)
- o Peripheral vascular disease is contraindicated in peripheral VA ECMO
- o VV ECMO is contraindicated in cardiogenic failure and in Severe chronic pulmonary hypertension (mean pulmonary artery pressure >50 mmHg)

Relative: contraindication for anticoagulation, advanced age, obesity

ASE GUIDELINES & STANDARDS

Echocardiography in the Management of Patients with Left Ventricular Assist Devices: Recommendations from the American Society of Echocardiography

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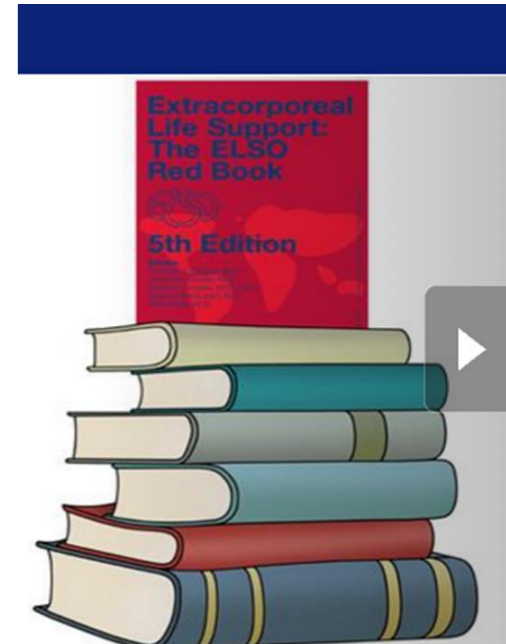
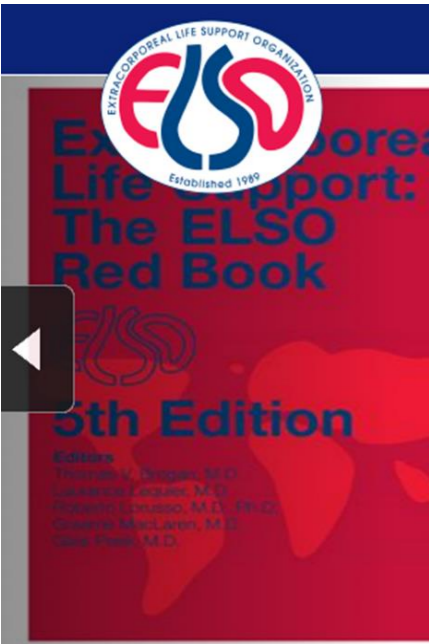
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