

# Extracorporeal Membrane Oxygenation (ECMO) for Cardiopulmonary Insufficiency

**ICD-10 COORDINATION AND MAINTENANCE COMMITTEE MEETING  
MARCH 5, 2019**

**THE SOCIETY OF THORACIC SURGEONS  
EXTRACORPOREAL LIFE SUPPORT ORGANIZATION**



# Disclosures

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INVESTIGATOR FOR MOMENTUM 3 STUDY BY ABBOTT MEDICAL

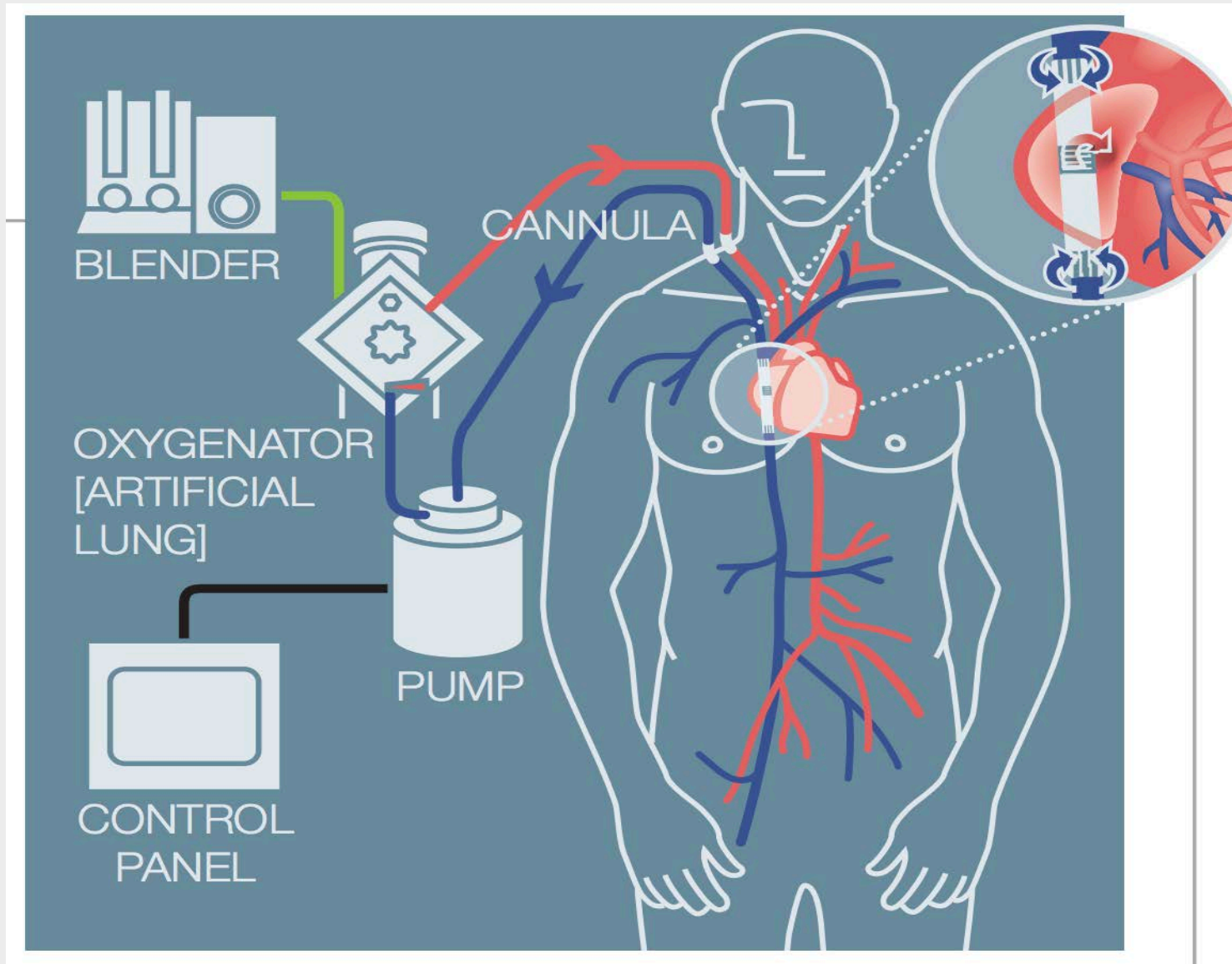
# ECMO Overview

- ▶ ECMO is an advanced life support technique
  - ▶ Used in critically ill patients who are at imminent risk of death from severe heart, lung or heart-lung failure
  - ▶ ECMO replaces heart and/or lung function, is maintained for days to weeks until organ recovery, transition to longstanding organ replacement, or death
  - ▶ Continuously circulates blood from the body through the ECMO machine where it is oxygenated and then returned to the patient
  - ▶ Two Modes of ECMO Support
    - ▶ Cardiac and respiratory support - Veno-Arterial (VA)
    - ▶ Respiratory support – Veno-Veno (VV)
- ▶ Pre-planned temporary support during a procedure
  - ▶ Lung transplant
  - ▶ High risk percutaneous coronary intervention (PCI)
  - ▶ Catheter based valve procedures
  - ▶ Ventricular ablations

## Indications

- ▶ **Respiratory Failure**
  - ▶ ARDS
  - ▶ Aspiration
  - ▶ Asthma
  - ▶ Post lung transplant
  - ▶ Lung contusion
- ▶ **Cardiac Failure**
  - ▶ Cardiac arrest
  - ▶ Pulmonary embolus
  - ▶ Drug overdose
  - ▶ Post cardiac surgery
  - ▶ Bridge to transplant
  - ▶ Cardiogenic shock

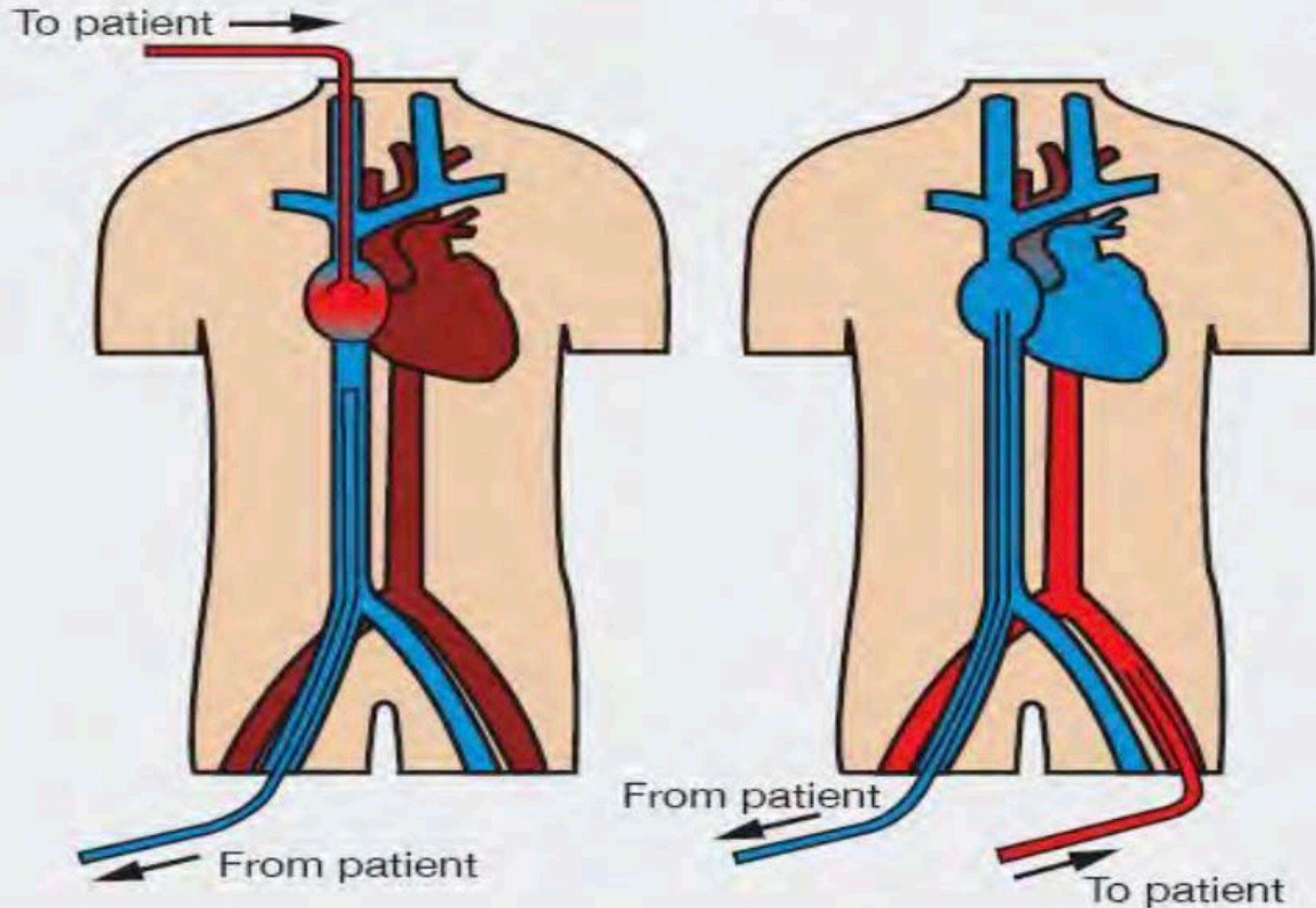
# ECMO Circuit



# Application of ECMO

► Veno-Venous

► Veno-Arterial



# ECLS Registry Report

## ECLS Registry Report

### International Summary

January, 2017

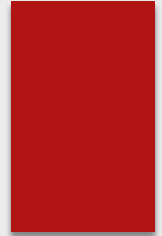


Extracorporeal Life Support Organization  
2800 Plymouth Road  
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### Overall Outcomes

	Total Runs	Survived ECLS	Survived to DC or Transfer		
Neonatal					
Pulmonary	29,942	25,205	84%	21,948	73%
Cardiac	7,169	4,643	64%	2,938	40%
ECPR	1,532	1,028	67%	627	40%
Pediatric					
Pulmonary	8,070	5,424	67%	4,632	57%
Cardiac	9,362	6,404	68%	4,758	50%
ECPR	3,399	1,958	57%	1,414	41%
Adult					
Pulmonary	12,346	8,242	66%	7,157	57%
Cardiac	10,982	6,251	56%	4,466	40%
ECPR	3,485	1,382	39%	993	28%
Total	86,287	60,537	70%	48,933	56%

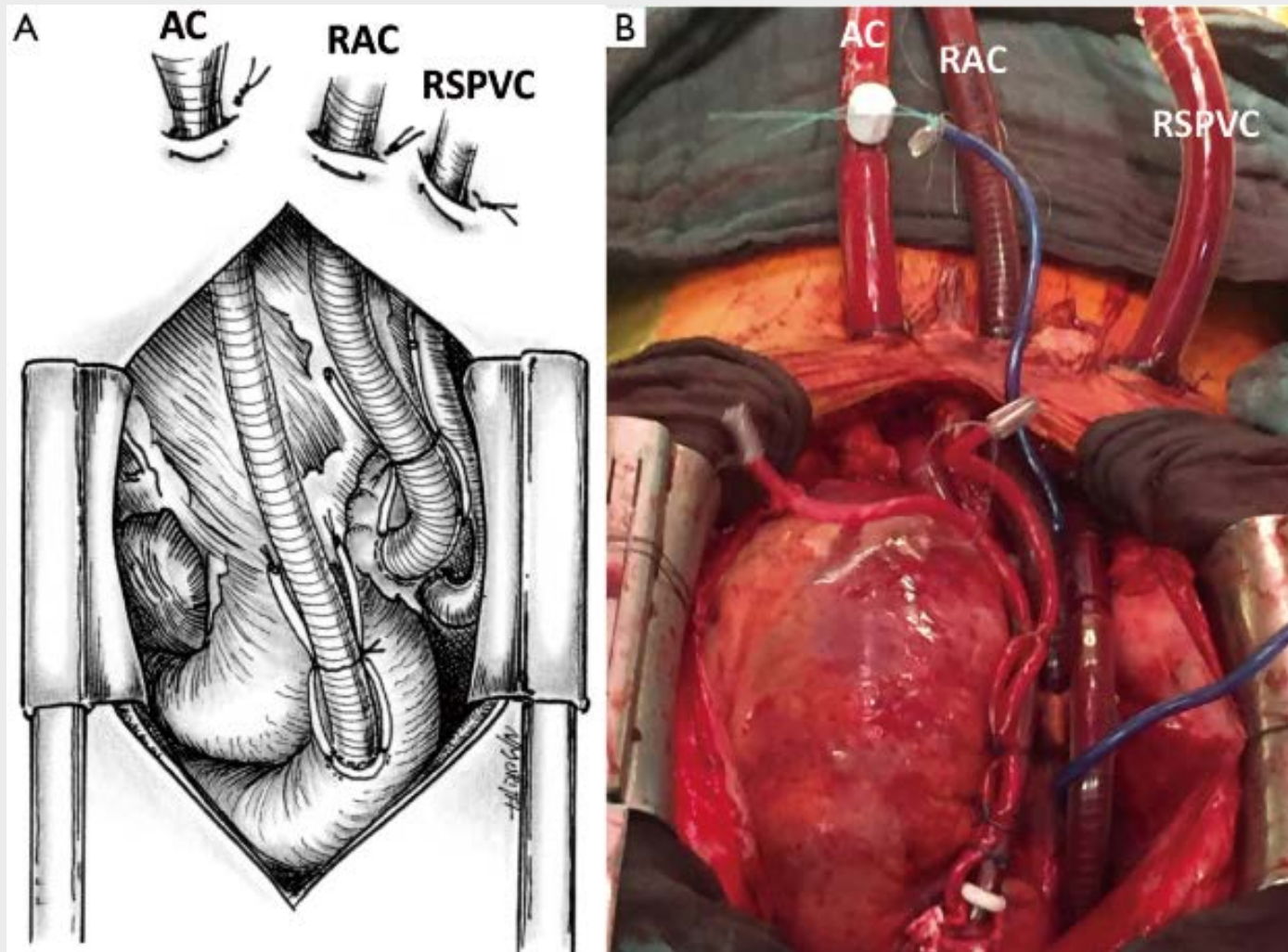
# ECMO Cannulation



- ▶ The method of access for venous and arterial blood
- ▶ A variety of methods of cannulation
  - ▶ Open central (e.g. median sternotomy, thoracotomy - cardiac chambers or great vessels)
  - ▶ Peripheral vessel access (e.g. femoral, cervical, or axillary vessels)
    - ▶ Open surgical cutdown
    - ▶ Percutaneous
- ▶ **Patient specific anatomic and clinical considerations concerning the peripheral vessels, and not surgeon preference, determine whether the peripheral access is accomplished percutaneously or by open cutdown**



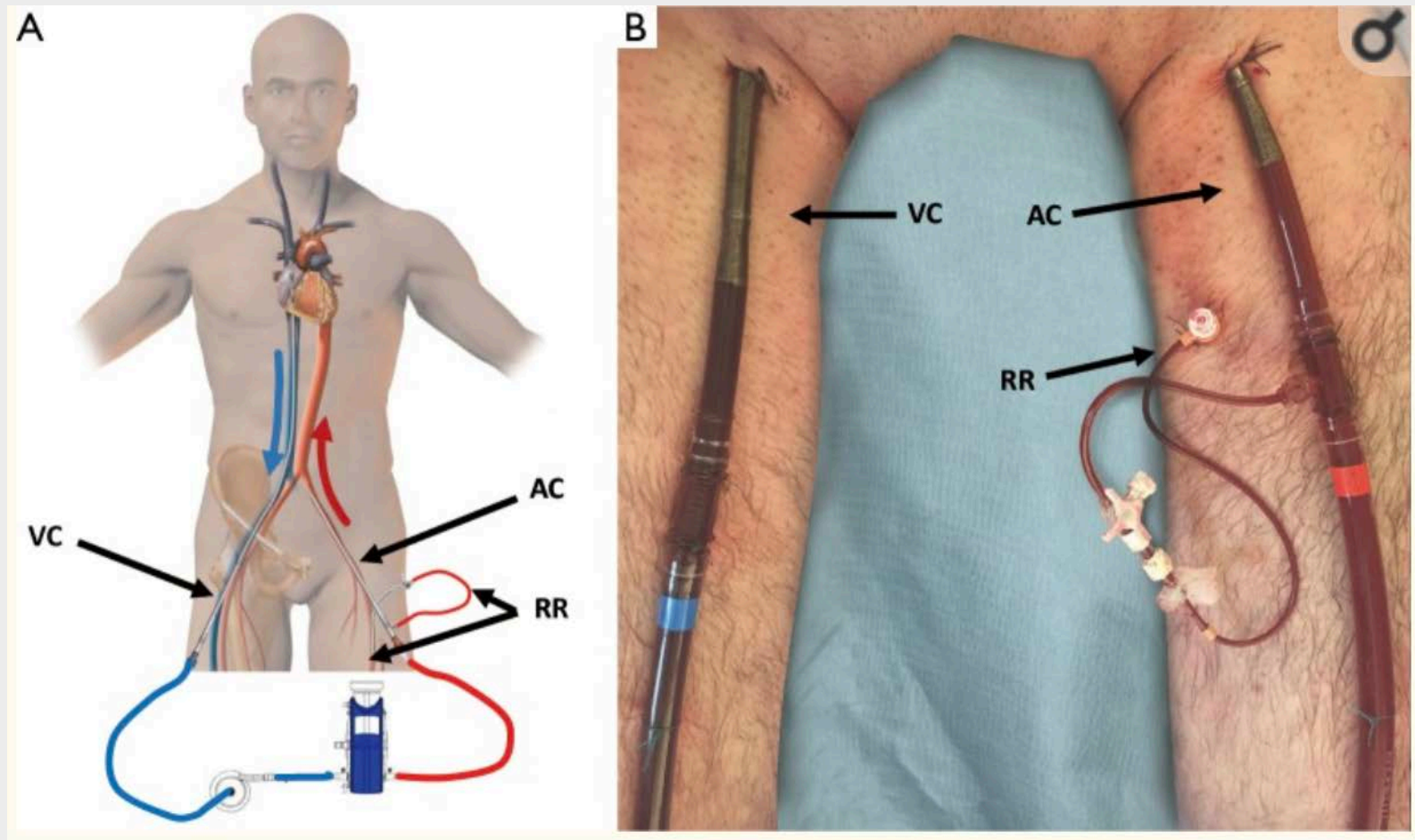
# Central Cannulation



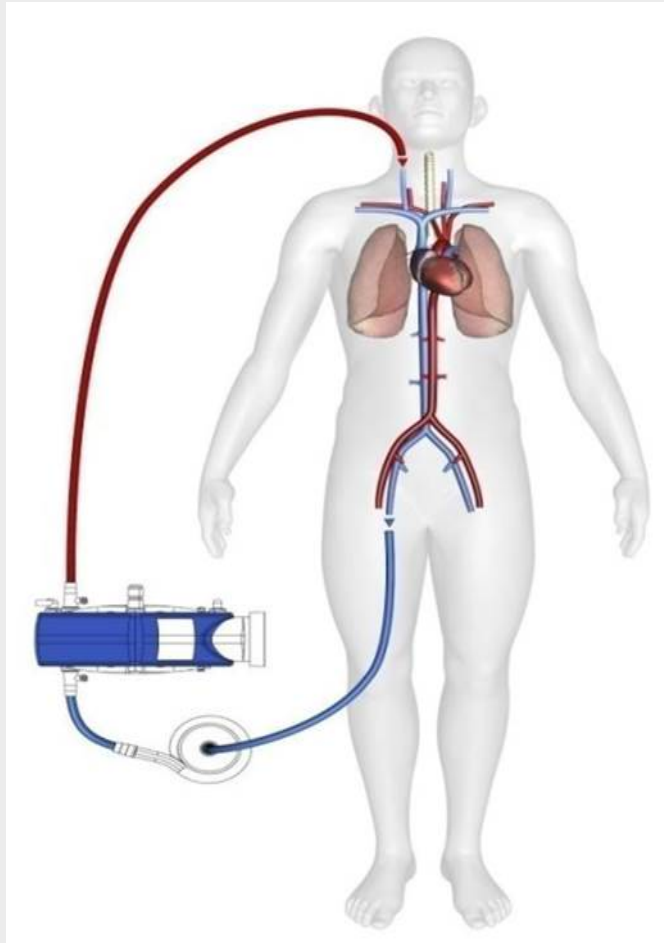


# Percutaneous Cannulation

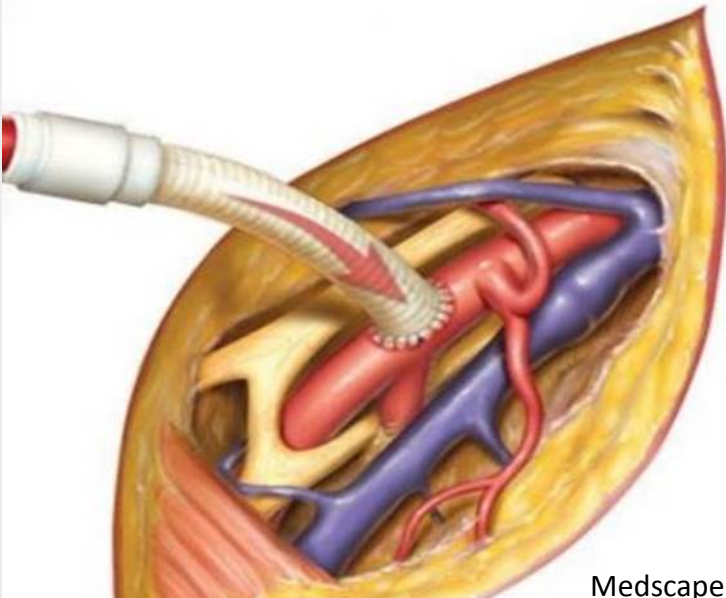
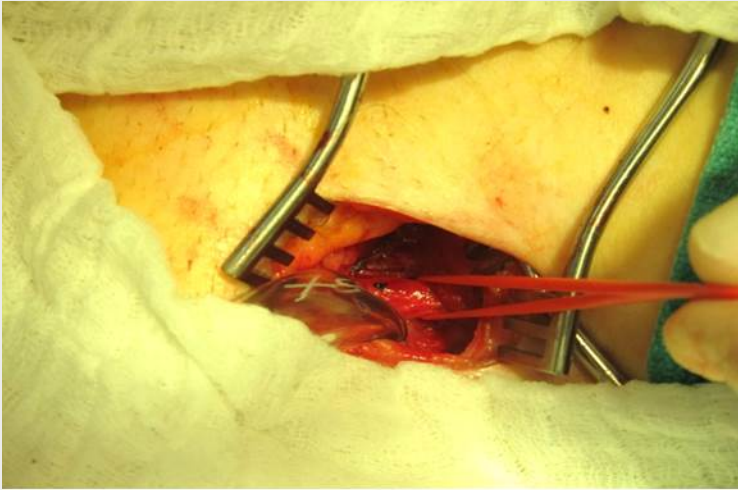
## Veno-arterial



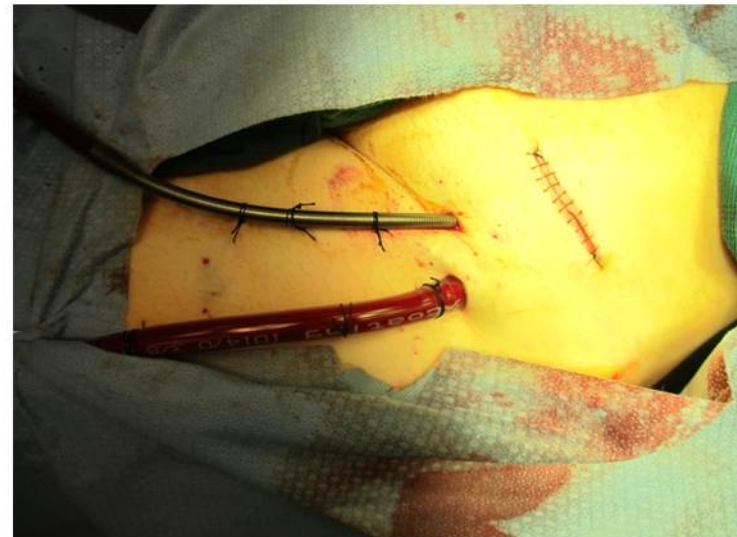
# Percutaneous Cannulation (2)



# Open Peripheral Cannulation



Medscape



Pictures – Jonathon Haft, MD



# Conclusion

- ▶ ECMO is most commonly a life-saving measure that can be accomplished via three methods of cannulation
  - ▶ method of cannulation has no bearing on severity of illness
- ▶ ECMO circuit is either a VV circuit for respiratory support or a VA circuit for cardiac and respiratory support
- ▶ ECMO can be used on a temporary basis for intra-procedural support
- ▶ CODING should describe all ECMO cannulation methods and circuits
  - ▶ Open central (median sternotomy, thoracotomy)
  - ▶ Open peripheral VA and Open peripheral VV
  - ▶ Percutaneous peripheral VA and percutaneous VV
  - ▶ Temporary procedural VA support and VV support
  - ▶ This increased granularity consistent with goal of ICD-10 PCS