2026 California Thoracic Society Annual Educational Conference

& Chronic Obstructive Pulmonary Disease Symposium

Thursday March 12, 2026-Sunday March 15, 2026

Earn up to 19 CME/CEU/MOC Credits

Jointly Provided by AKH Inc., Advancing Knowledge in Healthcare and the California Thoracic Society

PORTOLA HOTEL & SPA
AT MONTEREY BAY

Thursday March 12, 2026 (6 CME/CEU/MOC Credits)
COPD Symposium

Friday March 13, 2026 (6.5 CME/CEU/MOC Credits):
Advances in Interventional Pulmonary, Remote Monitoring in Pulmonary and Sleep Medicine, Approach to Symptom Management in Chronic Lung Disease and Critical Care

Saturday March 14, 2026 (6.5 CME/CEU/MOC Credits)
Sepsis and Shock, Extracorporeal Membrane Oxygenation, Inpatient Pulmonary Complications of Cancer Care

Sunday March 15, 2026
Fellow and Resident Track Symposium

California Thoracic Society
ATS Chapter Serving California and Arizona

AKH INC.
ADVANCING KNOWLEDGE IN HEALTHCARE

California Thoracic Society
Annual Conference
March 12-15, 2026
Portola Hotel and Spa, Monterey, CA

Saturday March 14, 2026

Advances in Management of the Patient with Sepsis

8:00 am – 8:10 am: Welcome and Introduction

8:10 am – 8:55 am: Keynote Address – Phenotyping and Personalized Medicine in Sepsis

- **Angela Rogers, MD (Stanford)** - This speaker will discuss phenotyping in the patient with sepsis and septic shock and how close we are to precision medicine in managing sepsis.

8:55 am – 9:20 am: Incorporating Artificial Intelligence Decision Making in Identifying Sepsis

- **Gabriel Wardi, MD (UC San Diego)** - This speaker will describe how artificial intelligence can be used to identify the septic patient before they present with end stage symptoms to impact care earlier in the course of illness.

9:20 pm – 9:35 pm: Pro: The Severe Sepsis and Septic Shock Early Management Bundle (SEP-1) Bundle Saves Lives

- **Sean Townsend, MD (CPMC-Sutter)**- This speaker will argue the benefits of the SEP-1 Bundle/how it saves lives.

9:35 pm – 9:50 pm: Con: : The Severe Sepsis and Septic Shock Early Management Bundle (SEP-1) Bundle Does Not Save Lives

- **Natalie Achamallah, MD, MS (Cottage Health)** - This speaker will argue the against the SEP-1 Bundle/highlight its limitations.

9:50-10:00 am Question and Answer

10:00 am – 10:30 am: Break

Extracorporeal Membrane Oxygenation

10:30 am – 10:55 am: When to refer to an ECMO center and when to deploy ECMO

- **Nida Qadir, MD (UC Los Angeles)** - This speaker will discuss the evidence behind the use of ECMO in patients with respiratory failure and when providers should consider referral to an ECMO center and when centers should use ECMO.

10:55 am – 11:20 am: What about ECMO to go?

- **Mazen Odish, MD (UC San Diego)** - This speaker will discuss the advent of mobile ECMO services, how they can help improve patient care, and the use of extracorporeal cardiopulmonary resuscitation.

11:20 am – 11:45 pm: Ventilator Strategies for the patient on ECMO

- **Abirami Kumaresan, MD (Cedars-Sinai)** - This speaker will discuss the how ventilator strategies may differ in the patient on ECMO and how different ECMO configurations impact which ventilator strategy to use.

11:45 pm – 12:10 pm: What you need to know about pediatric ECMO

- **Kathleen Ryan, MD (Stanford)** - This speaker will discuss the utility of ECMO in neonates and children, and the complexities of management in children who needs mechanical support.

12:10 pm – 12:20 pm: Question and Answer

12:20 pm – 1:20 pm: Lunch

Hands-On Session:

1:20 pm – 2:20 pm: Non-Invasive Cardiac Output Monitors **Speaker Abirami Kumaresan, MD (Cedars-Sinai)** ECMO Machines **Mazen Odish, MD (UC San Diego)** ECMO Placement **David Gordon, DNP (UC San Francisco) & Brianna Zuckerman, NP (UC San Francisco)** Ventilator Settings and Portable ventilators **Joe Van Vleet, RT (UC Los Angeles) & Theresa Cantu, RT (Valley Children's)**

2:20 pm – 2:45 pm: Break

Inpatient and Pulmonary Complications of Cancer Care

2:45 pm – 3:10 pm: Pulmonary Complications of Hematopoietic Stem Cell Transplantation

- **Husham Sharifi, MD (Stanford)** - This speaker will discuss the pulmonary complications that arise after HCT, in particular the development of bronchiolitis obliterans syndrome and approaches to management.

3:10 pm – 3:35 pm: Pulmonary Vascular Complications of Malignancy

- **Naomi Habib, MD (Norton Thoracic Institute)**- This speaker will discuss the Pulmonary Vascular Disease complications of malignancy including PA sarcoma, pulmonary tumor thrombotic microangiopathy, and medications that can cause PAH.

3:35 pm – 4:00 pm: Drug induced Interstitial Lung Disease and Pneumonitis During Cancer Therapy

- **Weijia Chua, MD (Stanford)** - This speaker will discuss the pulmonary complications of interstitial lung disease and pneumonitis that develop after chemotherapy and targeted immunotherapy

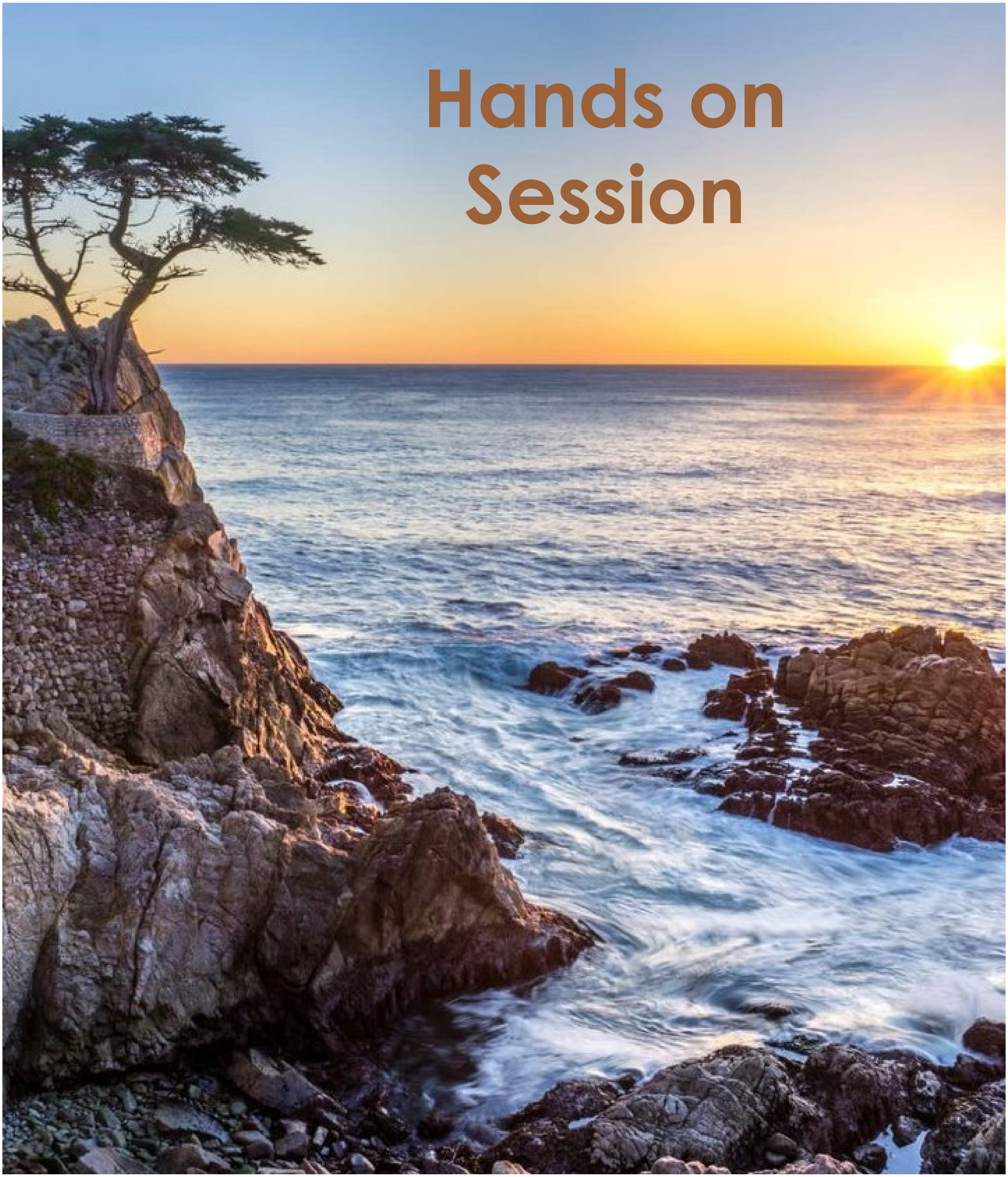
4:00 pm – 4:25 pm: Respiratory Complications of Acute Leukemia

- **Hugh Davis, MD (City of Hope)** - The speaker will discuss various oncologic emergencies, how they are recognized, and how they are managed in the acute setting.

4:25 pm – 4:35 pm: Question and Answer

5:30 pm – 7:30 pm: Trainee Poster Competition (NON-CME) – Food and beverages will be served

Hands on Session



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Abi Kumaresan MD is an Assistant Professor and Vice Chair of Anesthesiology at Cedars-Sinai Medical Center in Los Angeles. Her areas of expertise include cardiac anesthesiology and critical care medicine. Dr. Kumaresan's research interests include the physiological impact of critical illness and its impact on outcomes for ICU survivors.

Mazen Odish, MD is a NIH funded physician-scientist and intensivist at the University of California, San Diego in the Division of Pulmonary, Critical Care, and Sleep Medicine. Dr. Odish attends in the intensive care units and is a core member of UCSD's Extracorporeal Membrane Oxygenation (ECMO) program. He helps run the mobile ECMO team, ECPR, and ECMO quality improvement, and education programs. He further teaches for the extracorporeal life support organization. His NIH funded research is in ventilator settings during V-V ECMO.

David Gordon DNP received both his Masters and Doctoral degrees in nursing from Case Western Reserve University. He is a board-certified Adult and Acute Care Nurse Practitioner. He started his career at the Cleveland Clinic in Critical care cardiology as an ICU nurse in 2007 and in 2009 as a Nurse Practitioner in post operative cardiothoracic surgery. David joined the UCSF Lung Transplant program in 2011. David has been an integral member of the inpatient lung transplant program, where in his tenor has helped develop and launch two primary admitting services for lung transplant surgical and medical patients. David is also a volunteer faculty with the UCSF School of Nursing. He is a UCSF Learning Health Systems 'Lean Implementation' Coach and the 2024 Caring Wisely award winner for his chest x-ray reduction project. He is an ECMO expert and provides annual didactics to the UCSF Pulmonary Fellowship program on ECMO.

Joseph Van Vleet is a full-time clinician and Pulmonary Navigator in the Respiratory Therapy Department at UCLA Medical Center. He graduated from the Los Angeles Valley College Respiratory Therapy Program. He received his bachelor's degree in respiratory care at the University of Missouri. He has 12 years of clinical experience at UCLA working in the NICUs, ICUs, Emergency Department, COPD Clinic and Post-ICU Clinic, and assists with performance improvement projects on both campuses. He helped develop the Post-ICU Recovery Clinic at UCLA and assists with recruitment and post-discharge navigation for that population.

Theresa Cantu is a respiratory care leader with 12 years of clinical experience at Valley Children's Healthcare. She holds a Master of Science in Respiratory Care and has dedicated her career to advancing evidence-based practice, improving pulmonary patient outcomes, and strengthening the respiratory care profession.

Throughout her tenure at Valley Children's, Theresa has been actively involved in clinical innovation, quality improvement initiatives, and interdisciplinary collaboration to enhance care delivery for pediatric patients with acute and chronic respiratory conditions. She is passionate about advancing the role of respiratory therapists through leadership, advocacy, and strategic program development.

Theresa remains committed to improving access to high-quality respiratory care, promoting health equity, and shaping the future of advanced practice respiratory therapy to better serve patients and communities across California.

ECMO Cannula Types

Clinical Reference Guide

	ADVANTAGES	LIMITATIONS

V-V

SMALL

R IJ · Avalon / Crescent

Advantages

- Patient can ambulate
- Bridge to recovery, lung transplant
- Less invasive — single catheter

Size	Flow (LPM)	Population
13 Fr	1.0 – 1.5	Neonatal / Small Pediatric
15 Fr	1.5 – 2.0	Pediatric
19 Fr	2.5 – 3.0	Large Pediatric / Small Adult
24-32 Fr	3.5 – 4.0	Adult

Limitations

- Contraindicated with Pulmonary Hypertension
- Smaller cannula → lower flow
- Cannot be done emergent, requires TEE/Fluoroscopy
- No left cardiac support

V-PA

MEDIUM

R IJ · Protek

Advantages

- Patient can ambulate
- Bridge to recovery, lung transplant
- Usable with PH
- Single catheter, RVAD

Size	Flow (LPM)	Population
29, 31 Fr	4.5-5.0	Adult

Limitations

- Smaller cannula → lower flow
- Cannot be done emergent, requires TEE/Fluoroscopy
- No left cardiac support
- ↑ PVR → risk RV dysfunction

V-A

LARGE

Fem–Fem

Advantages

- Emergent bedside placement
- Left cardiac support ; Bridge to recovery, lung or heart transplant
- Larger cannula → higher flow

Size (Arterial)	Flow (LPM)	Population
8-12 Fr	1.0 – 1.5	Neonatal / Small Pediatric
14 Fr	1.5 – 2.0	Pediatric
15 Fr	2.0 – 3.0	Large Pediatric / Small Adult
17 Fr	3.0-4.0	Standard Adult
19 Fr	4.0-5.0+	Larger Adults

Limitations

- No ambulation (bedrest)
- Retrograde flow (mixing cloud)
- High morbidity & mortality: parasthesias, loss limb, thrombus, stroke

V-A

CENTRAL

Aorta – RA

Advantages

- Full cardiopulmonary support
- Antegrade flow, no mixing cloud
- Theoretical ambulation if tunneled
- RVAD

Size	Flow (LPM)	Population
Aortic (Arterial) 20 Fr – 24 Fr	4.0-7.0	Standard Adult
Venous (Single) 32 Fr – 40 Fr	4.0-6.0+	Standard Adult

Limitations

- Requires OR
- Open chest or tunneled graft

RPM + Cannula Size + Vessel Size + Preload = LPM

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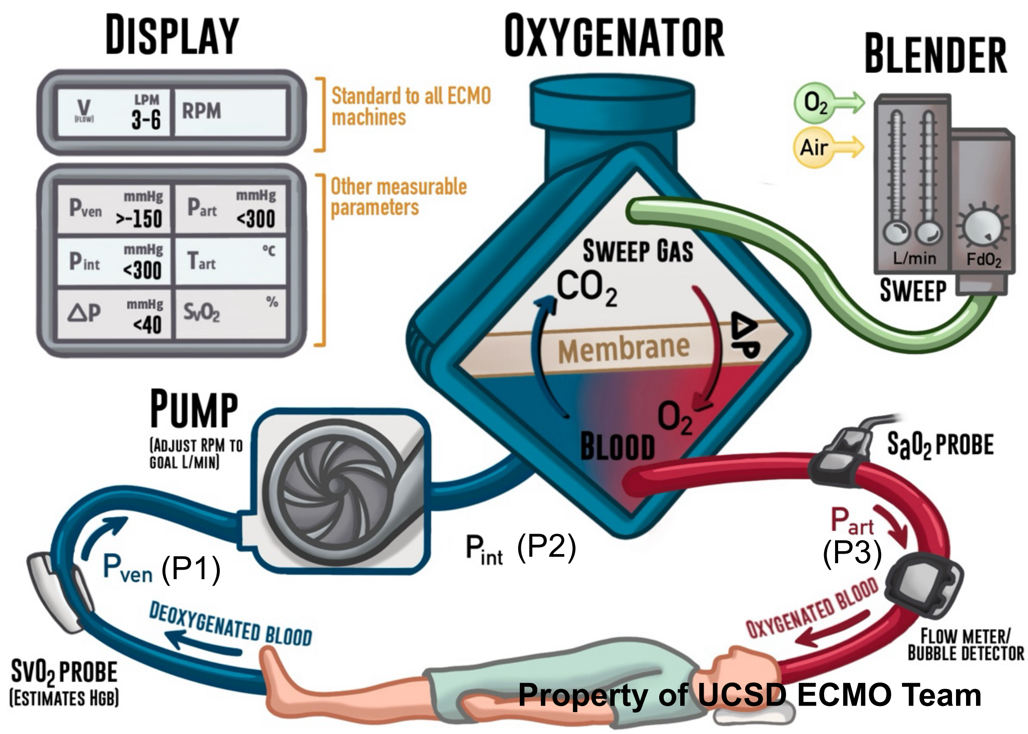
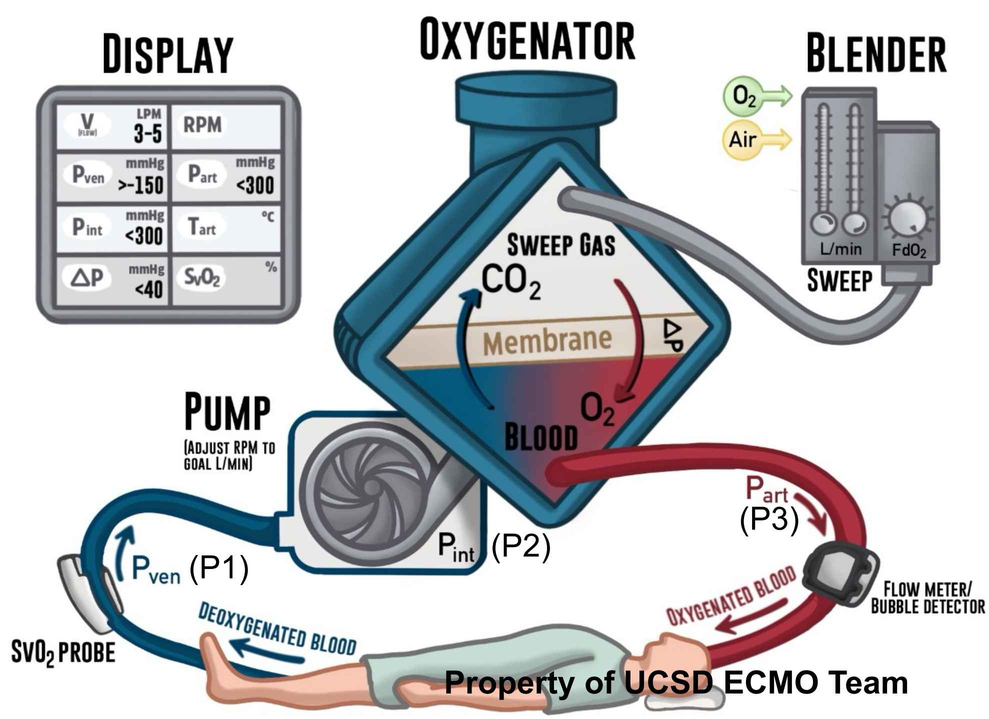
ECMO Circuit Hands on Session

Presenter: Mazen Odish, MD (UCSD)

Modular Circuit – pump and membrane oxygenator separated.



Non-Modular Circuit – pump and membrane oxygenator in one housing.



Variable	Definition	Notes
Speed	Rotations per minute of centrifugal pump (RPMs)	Titrated by ECMO specialist to maintain ordered flow goals
Flow	Blood flow in liters per minute	Ordered by provider
P1 (P_{ven})	Pressure pump must generate to drain blood	Increased venous pressure → Assess for kink, clot, or drainage insufficiency
P2 (P_{INT})	Pressure pump must generate to push through oxygenator and return tubing	Used to calculate Delta Pressure
P3 (P_{ART})	Pressure pump must generate to return blood	Increased arterial pressure → Assess for kink, clot, or high SVR (on V-A ECMO)
Delta P	Delta P = P3 – P2 Delta P: Pressure drop across oxygenator. Tells us if oxygenator has increased resistance due to internal clots.	Abnormal if increases or if doubles from baseline
T_{ART}	Temperature of blood returning to patient	Heater set by ECMO specialist per provider order
SvO2/$SO_{2\ IN}$	Dependent on cardiac output, oxygen delivery and consumption, and ECMO FdO_2. If high, consider recirculation on V-V ECMO	Measured on drainage tubing prior to oxygenator
SaO2/$SO2_{\ OUT}$	Dependent on oxygenator health and FdO_2,	Measured on return tubing after oxygenator

Mechanical Ventilation Strategies for the VV-ECMO Patient

VA-ECMO	
Primary Indication	Isolated Respiratory Failure (e.g., ARDS, COVID-19)
System Support	Lungs only (Gas exchange)
Cannulation	Vein to Vein (e.g., Femoral v. to Internal Jugular v.)
Circulatory Effect	Relies on the patient's cardiac output
Ventilation Goal	Ultra-Protective: Total lung rest to allow recovery.

- **Ultra-Protective Ventilation**
  - Low Tidal Volume (Vt)): The strategy emphasizes reducing V_t to 4 mL/kg of predicted body weight (PBW). This prevents volutrauma. (Assouline & Combes, 2021; Rehder & Alibrahim, 2023).
  - Plateau Pressure (Pplat) Limitation: Strict adherence to keeping Pplat less than 24 cmH_2O is recommended to avoid barotrauma (Hohmann et al., 2025).
- **Driving Pressure (Delta P) Targeting**
  - Recent evidence suggests that Delta P (Pplat - PEEP) is the most critical ventilator variable associated with mortality in VV-ECMO.
  - Target: Keeping Delta P < 15cmH_2O (Brodie et al., 2022).
  - Rationale: Minimizing the "stretch" applied to functional lung units is essential during the inflammatory phase of respiratory failure (Urner et al., 2022).
- **PEEP Strategy for Alveolar Recruitment**
  - In VV-ECMO, PEEP is utilized to maintain lung volume rather than to drive oxygenation (which is handled by the circuit).
  - Moderate to High PEEP: Settings of 10 - 15 cmH_2O are typically used to prevent "atelectrauma" (Fior et al., 2022).
  - Prevent atelectasi: High PEEP to maintain FRC and help offset the smaller tidal volumes (Hohmann et al., 2025).
- **Reduction of Mechanical Power**
  - Mechanical power represents the total energy transferred from the ventilator to the lungs over time.
  - Low Respiratory Rate: Reducing the rate to 5–10 breaths per minute significantly lowers mechanical power (Assouline & Combes, 2021).
  - Lower FiO_2: The ventilator FiO_2 is often decreased to < 50% to avoid pulmonary oxygen toxicity and absorption atelectasis, relying on the ECMO sweep gas for oxygenation (Rehder & Alibrahim, 2023).
- **Diaphragm Protection & Spontaneous Breathing**
  - As the patient moves out of the acute phase, the strategy shifts toward preventing diaphragm atrophy.
  - Early Spontaneous Effort: Transitioning to modes like Pressure Support Ventilation (PSV) allows for diaphragm activity (Szuldrzynski et al., 2024).
  - Monitoring P-SILI: Clinicians must monitor for "Patient-Self Inflicted Lung Injury" (P-SILI) caused by excessive spontaneous respiratory effort (Passarelli et al., 2023).
- **Weaning-Specific Ventilation**
  - During the weaning phase, the ventilator must compensate as the ECMO "sweep gas" is titrated down.
  - Titration: As sweep gas flow is reduced, ventilator support (rate or pressure support) is incrementally increased to ensure PaCO2 and pH remain within safe limits (Passarelli et al.,

2023).

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2. Brodie, D., Abrams, D., MacLaren, G., Brown, C. E., Evans, L., Barbaro, R. P., Calfee, C. S., Hough, C. L., Fowles, J., Karagiannidis, C., Slutsky, A. S., & Combes, A. (2022). Extracorporeal membrane oxygenation during respiratory pandemics: Past, present, and future. American Journal of Respiratory and Critical Care Medicine, 205(12), 1382–1390. https://doi.org/10.1164/rccm.202111-2661CP

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Mechanical Ventilation Strategies for the VA-ECMO Patient

	VA-ECMO
Primary Indication	Cardiac Failure or Combined Cardio-Respiratory Failure
System Support	Heart & Lungs (Gas exchange + Hemodynamic support)
Cannulation	Vein to Artery (e.g., Femoral v. to Femoral artery)
Circulatory Effect	Provides bypass of the heart; increases systemic perfusion
Ventilation Goal	Protective + LV Management: Prevent LV distension and "North-South Syndrome."

- **Ultra-Protective Ventilation**
  - The primary goal during the initial phase of ECMO is to minimize Ventilator-Induced Lung Injury (VILI) by resting the lungs.
  - Low Tidal Volume (Vt): Reducing Vt to < 4 mL/kg of predicted body weight (PBW). Some strategies even suggest "near-apneic" ventilation (Assouline & Combes, 2021; Rehder & Alibrahim, 2023).
  - Plateau Pressure Pplat Limitation: maintaining Pplat below 20–25 cmH2O to prevent alveolar overdistension (Hohmann et al., 2025).
- **Driving Pressure (Delta P) Optimization**
  - Current trends emphasize Delta P (Pplat - PEEP) as a key predictor of mortality.
  - Target: Keeping Delta P < 10 - 14 cmH2O.
  - Rationale: Lower driving pressures are associated with improved survival in patients with severe respiratory failure transitioned to ECMO (Brodie et al., 2022; Fior et al., 2022).
- **Positive End-Expiratory Pressure (PEEP) Management**
  - In VA-ECMO, PEEP is not just for oxygenation; it is a tool for LV afterload reduction.
  - Moderate to High PEEP: Settings typically range from 10–15 cmH2O to atelectasis and to provide intrinsic pressure that helps prevent Left Ventricular (LV) distension—a common complication in VA-ECMO (Szuldrzynski et al., 2024).
  - Atelectrauma Prevention: PEEP is maintained to keep alveoli open during the "rest" phase (Fior et al., 2022).
- **Minimizing Mechanical Power and Respiratory Rate**
  - Low Respiratory Rate: Reducing the rate to 5–10 breaths per minute to decrease the "mechanical power" (energy transfer) applied to the lung parenchyma (Assouline & Combes, 2021; Hohmann et al., 2025).
  - Low FiO2: Keeping the delivered oxygen fraction on the ventilator as low as possible (typically < 0.5) to oxygen toxicity, as the ECMO blender handles the bulk of oxygenation (Rehder & Alibrahim, 2023).
- **Transition to Spontaneous Breathing**
  - As the patient stabilizes, strategies shift toward activating/involving the diaphragm
  - Modes: Transitioning from controlled modes to Pressure Support Ventilation (PSV) or Airway Pressure Release Ventilation (APRV).

- Weaning Considerations: Monitoring for "pendelluft" (internal gas movement) and ensuring the patient does not generate excessive transpulmonary pressures while breathing spontaneously (Passarelli et al., 2023; Szuldrzynski et al., 2024).

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