

From Postpartum Hemorrhage to Cardiac Arrest: Multidisciplinary Management With VA-ECMO

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4 T's of Post-Partum Hemorrhage (PPH)

Tone (70%)	Uterine Atony Tx: Massage, Uterotonics (Oxytocin)
Trauma (20%)	Lacerations, Hematomas, Rupture Tx: Repair, Packing, OR
Tissue (10%)	Retained products of conception Tx: Evacuation, D&C
Thrombin (1%)	Coagulopathies, DIC Tx: Replace coagulation factors

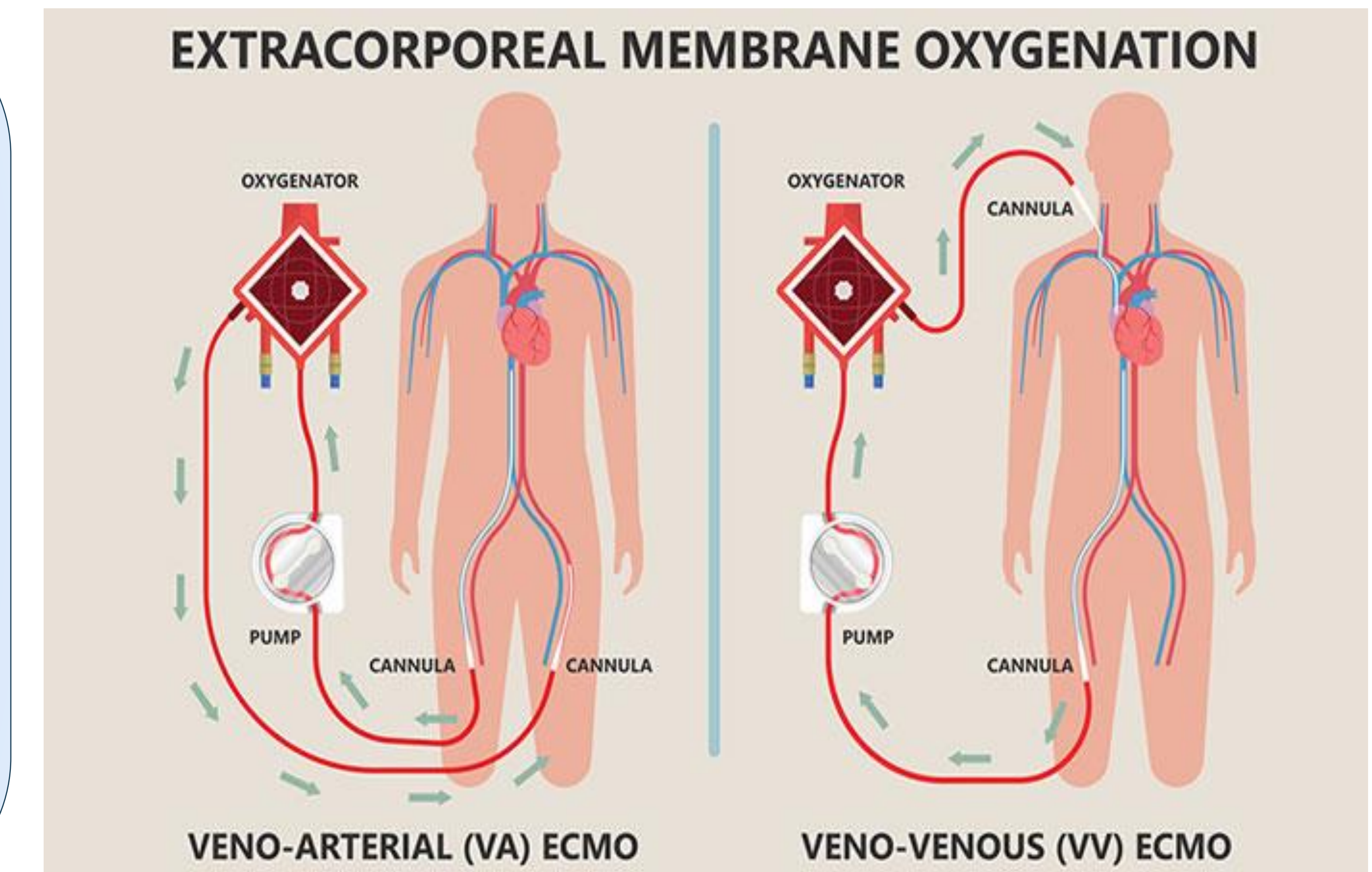


PPH is cumulative blood loss ≥ 1000 mL or blood loss with signs of hypovolemia within 24 hours of delivery

- It complicates up to 1 in 10 deliveries and remains a leading cause of maternal mortality worldwide, accounting for approximately 27% of maternal deaths¹

ECMO use in obstetric patients is rare, occurring at a rate of approximately 4.7-5.2 per 100,000 discharges³

- The majority of obstetric ECMO cases occur in the **postpartum period** (64-89% of cases), with most cannulations occurring within the first 24 hours after delivery⁴
- Maternal survival rates** have improved substantially, and a 2025 meta-analysis of 1,460 women found an overall maternal survival of 74.4%⁵
- ECMO in maternal cardiac arrest shows particularly impressive results, with **87.7% successful resuscitation** when ECMO is deployed early, compared to 58.9% success across all maternal arrests⁶



¹Lancet. 2025. Yunas I, Islam MA, Sindhu KN, et al.

²Obstetrics and Gynecology. 2017. Committee on Practice Bulletins-Obstetrics.

³Anesthesia and Analgesia. 2022. Taha B, Guglielminotti J, Li G, Landau R.

⁴Circulation. 2023. Meng ML, Arendt KW, Banayan JM, et al.

⁵The Journal of Maternal-Fetal & Neonatal Medicine : The Official Journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania ⁶Perinatal Societies, the International Society of Perinatal Obstetricians. 2025. Lu S, Zhang Y, Wei S, et al. Circulation. 2023. Meng ML, Arendt KW, Banayan JM, et al.

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Case: 41 yo otherwise healthy G1P0 at 40w1d came in for induction of labor

Labor was complicated by recurrent fetal heart rate decelerations requiring operative vaginal delivery with forceps in labor room

- Following delivery, she developed uterine atony with **massive postpartum hemorrhage (~1600 mL)**
- Hemabate, methergine, TXA, oxytocin, 1L crystalloid → emergently transferred to the operating room for **exploratory laparotomy and hysterectomy**
- En route, she developed hypoxia, hypotension, and altered mental status → **emergent intubation in OR**

↳ Intraoperatively, the patient developed **PEA arrest** requiring immediate CPR

- **Massive transfusion protocol** was activated with an **EBL ~6L** and evidence of **profound DIC**
- Trauma surgery performed an **emergent aortic cross-clamp → ROSC**
- Initial TEE demonstrated preserved cardiac function → refractory hypoxemia despite maximal ventilatory support, with frothy pulmonary secretions and severe metabolic and respiratory acidosis
- Total products: 9 units of pRBCs, 11 units of FFP, 2 units of platelets, and 4 units of cryoprecipitate
- Lab work: **pH 6.98**, PaO₂ 39, PaCO₂ 80, **lactate 11**, **fibrinogen 60**, elevated PT/PTT, **platelets 31**, hemoglobin 10

↳ Due to the patient's persistent hypoxemia, VV ECMO was initially planned

- Recurrent PEA arrests, escalating vasopressor requirements, and newly reduced cardiac function on repeat TEE → **VA-ECMO**
- Formal TTE on POD 1: **EF 20% with global hypokinesis**, with **complete recovery by POD 4** (EF 65%, normal function)
- ECMO was discontinued on **POD 3**
- The patient demonstrated gradual hemodynamic and end-organ recovery, was **extubated on POD 7**
- **Discharged home on POD 30** without neurologic deficits

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Catastrophic postpartum hemorrhage remains a leading cause of maternal morbidity and mortality

- In this case, rapid progression to hemorrhagic shock was complicated by consumptive coagulopathy, recurrent PEA arrests, and severe hypoxemia
- The patient's hemodynamic instability, profound acidosis, and refractory hypoxemia required escalation from standard resuscitation to VA-ECMO

START:

UNC protocol for peripartum ACLS

If pulseless, START CPR (Adult ACLS, see Card #)

- ☐ Call Code Blue & Code Stork (if pregnant)

LEADER

designates

Checklist reader

Time Keeper + Scribe

Patient & Family Communicator

- ☐ Bring code cart & cesarean tray
 - ☐ Place backboard under patient
 - ☐ Ensure adequate venous access above diaphragm
 - ☐ Stop all sedating medications
 - ☐ Ensure manual uterine displacement
 - Consider perimortem cesarean delivery
- GOAL: Incision by 4 mins, delivery <5 mins**
- ☐ Consider VA-ECMO with refractory cardiac arrest or severe RV failure

Transient, stress-induced cardiomyopathy likely contributed to her deteriorating cardiac function and guided the decision to convert from planned VV- to VA-ECMO

- Early recognition, aggressive massive transfusion, intraoperative TEE, and coordination with trauma surgery for emergent aortic cross-clamp were critical for survival

- This case underscores prompt airway control and hemodynamic support during massive hemorrhage, continuous reassessment of cardiac function, and early multidisciplinary involvement including trauma, cardiac surgery, and critical care
- The patient's full cardiac and neurologic recovery highlights the potential for excellent outcomes with coordinated, rapid intervention in extreme obstetric emergencies!