Apheresis Nurse Perspective: Tandem Procedures

Barbara Reasonover, RN, HP (ASCP)
Clinical Apheresis Nurse
Dallas, TX
Clinical Apheresis Services
Patient: 13 Year Old Female with concurrent ECMO (Extracorporeal Membrane Oxygenation) and CVVHD (Continuous Veno-Venous Hemodialysis)

Diagnosis: Sepsis with MODS
(Multisystem Organ Dysfunction Syndrome)

Requested Treatment: 1.1 plasma volume exchange to be done concurrently with ECMO and CVVHD using the ECMO Circuit
Disease: Sepsis with Multiorgan Failure.

Category III- Optimum role of Apheresis Therapy is not established. Decision making should be individualized.

Grade 2B- Weak recommendation, moderate-quality evidence.

Implications- Weak recommendations best action may differ depending on circumstances or patient’s or societal values.
What Do You Do Next?

Medical Director Approval is Necessary.
Procedure Orders

Calculated

Patient Total Blood Volume (TBV)
ECMO ECV
+ CVVHD ECV

= Patient total procedure blood volume

ECV- Extracorporeal volume of the circuit

2500ml replacement fluid ordered for 1.1 Plasma volume exchange

Replacement fluids: total 2500ml
1500ml albumin 5%
1000ml FFP

Calcium supplementation:
1gram Calcium Chloride IVPB to be given concurrently with TPE.

TBV- Total Blood Volume

• Weight (kg) x Body build factor = TBV
  • 39 kg x 70 = 2730 ml

• ECMO ECV = 500 ml

• CVVHD ECV = 170 ml

• 2730 + 500 + 170 = 3400 ml

• 1.0 Plasma Volume = (1 - Hct x TBV)
  • (1 - 0.36) x (3400 ml)
  • (0.64) x (3400 ml) = 2176 ml

• 1.1 Plasma Volume Exchange = 2393 ml
Pediatric Considerations

1. Concurrent treatments
   a. ECMO
   b. CVVHD
   c. TPE

2. ECV calculations
   a. Actual vs. Ideal Body Weight
   b. Blood Prime
Pre Procedure cont.

**Blood Prime Considerations**

- TPE circuit: 185 ml
- ECMO circuit: 500 ml
- CVVHD circuit: 170 ml

- Circuit blood volume = 855 ml
- 15% of patient’s TBV = 410 ml
- CVVHD (170 ml) + TPE (185 ml) = 355 ml (13%)
- Decision made to proceed with Blood Prime
1. Patient Access: verify type of patient access
   a. Dialysis Central Venous Catheter
   b. ECMO circuit
   c. PICC line?

2. Consents
   a. Blood Transfusion
   b. Procedure Consent

3. Labs:
   a. CBC
   b. CMP
   c. Ionized calcium (Determine Frequency)
   d. Clotting studies
   e. Plasma free hemoglobin
Total Blood Volume Calculations

Pre-Mature Infant to One Month old = 100 mL/kg
Greater than 1 month to 4 months old = 85 mL/kg
Greater than 4 months to 10 years old = 80 mL/kg
Greater than 10 years to 17 years old = 70 mL/kg

TIME OUT

TANDEM PROCEDURE TIMEOUT

Carter BloodCare Physician notified: ___________________________ Date/Time: ______________

Date: _______________ Time: _______________
Ht: _______________ Wt: _______________ Hct: _______________
Initial Ionized Calcium: _______________
TBV: _______________ Extracorporeal Volume: 10%: _______________ 15%: _______________
Blood Prime Required: Yes / No Unit Lot #: _______________
Calcium Type: _______________ Dosage: _______________ Route: _______________
Timeout Completed By 1: _______________ 2: _______________ 3: _______________

Caution Timeout: Verify proper placement of all medication and access points used in the connection with the circuit.

ACD-A Ratio: _______________ 1 Approved Physician By: ___________________________
Primary Physician Name: ___________________________ Emergency Contact Number: _______________
Primary/Communicator Nurse Name: ___________________________
Secondary Nurse Name: ___________________________
Other Circuit: ECMO CVVHD BOTH
ECMO Nurse/Technician: ___________________________
CVVHD Nurse: ___________________________
Ventilator Technician: ___________________________
CONNECTIONS (To be determined by physician)
Spectra Optia Inlet Line: _______________ Return Line: _______________
Calcium Line: ___________________________
Employee Name/#: ___________________________
Procedure

A. Pre-Procedure Patient Assessment

B. Anticoagulation

C. Blood Warmer?

D. Blood Prime
D. Connecting TPE circuit to ECMO
E. Patient Monitoring

1. Vital Signs

2. Ionize Calcium
   a. Before procedure
   b. 30 minutes after start of procedure
   c. post procedure

3. Maintain communication with the care team

4. Procedure completed, NO RINSEBACK
F. Disconnect Patient

1. ECMO nurse will disconnect the patient
2. Calculate fluid volumes
3. Communication with patient care team
4. Complete all procedure documentation
5. Report to Medical Director
References


Thank You

Carter BloodCare Clinical Apheresis Staff
Dr. Todd Nishimoto
Dr. Geeta Paranjape
Christopher Edmond - Therapeutic Manager RN
Patricia Kellen-Wales RN
Butta Masih RN
Jin Kim RN
Shaniqua Henderson
Chrissy Anderson, RN, BSN, HP – former director

Children’s Medical Center Dallas
Dr. Daniel Noland & Dr. Hung Luu
Sandy Holdcraft, RN – Hemovigilence Officer (retired)
ECMO team
ICU Staff
ANY QUESTIONS?