

	Nom	Fonction	Date
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EQUIPMENT (depending on availability)

Before assembly, always ask the perfusionists to install 2 taps on the venous side for Renal Replacement Therapy (RRT).

- CPA (cardio pulmonary arrest): Sorin circuit
- Rescue ECMO (backup) => Sorin circuit
- Post cardiotomy indication: Sorin circuit
- ARDS - acute respiratory distress syndrome: Rotaflow (Maquet)
- MCAU (Mobile Circulatory Assistance Unit + Medical Evacuation: Cardiohelp (Maquet)

If prolonged resuscitation is necessary for more than 15 days, change from Sorin to Maquet circuits (Rotaflow or Cardiohelp).

CHANGING CIRCUITS

Sorin (certified for 7 days) => change on day 14 at the latest

Maquet (certified for 21 days) => change on day 21 at the latest

VV (VenoVenous) ECMO FOR ARDS (Acute Respiratory Distress Syndrome)

IMPLANTATION:

Firstly:

- Femoral-right internal jugular (reinjection)
- Or femoro-femoral approach
- Right internal jugular using double current cannula (Eg. AVALON®)
- Pediatrics: < 25-30kg: jugulo-femoral approach (reinjection)
- If possible, place central catheter under ultrasound guidance into the right internal jugular (verified with bedside X-ray) change under guidance for cannula implantation.

UFH bolus (unfractionated heparin) 50 -100 IU / kg before starting ECMO

Initial setting: flow rate 4l/min (50 to 100 ml/Kg/min). Flow rate 4l/min subsequently adjusting to PaCO₂, FiO₂ 100% (Reminder: flow rate is the main determinant of oxygenation level).

Immediately check the position of the cannulas by x-ray and/or TTE (Transthoracic Echocardiography) and/or TEE (Transesophageal Echocardiography) before unclamping.

Positioning mark:

- Drainage cannula at the LVC – RA junction (lower vena cava – right atrium)
- Reinjection cannula in the upper vena cava sector

MANAGEMENT

Oxygenation: OBJECTIVE: SpO₂ > 90-93%. It can sometimes be difficult to obtain despite an increase in flow from recirculation. PaCO₂ correction: Rapid elimination of CO₂ by fresh gas flow provided that the minimum ECMO flow is 10-15 ml/kg/min.

How to optimize oxygenation:

1. Recirculation can be a major problem
 - Risk factors are insufficient distance between the 2 cannulas, hypovolemia, low cardiac output, excessive ECMO flow.
 - Reduce recirculation = cannula position, filling, flow adaptation
2. Increase ECMO flow (flow = main factor in oxygenation): 5–6 l/min or 3 l/m² or > 60-70% of cardiac output (requires large drainage cannula).
 - Adults: Typically 60 ml/kg/min
 - Children: 90 ml/kg;
 - Infants: 120 ml/kg
3. Transfusion for Haemoglobin (Hb) > 8-10 g/dl
4. Reduce oxygen consumption = sedation (with or without curarization).
5. Reduce cardiac output
=> in cases of unsuitable sinus tachycardia - Esmolol Intravenous Electric Syringe

Mechanical ventilation:

- Ultra protective ventilation: CAV (controlled assisted ventilation) - Vt (tidal volume) 2-4 ml/kg (or Insufflation Pressure at 25cmH₂O), FiO₂ as low as possible, PEEP 5-15cm H₂O (be aware of venous return and hemodynamics), Fr 4-6/min, prolonged I:E. Pplateau < 30cmH₂O

Anticoagulation:

Reminder: Preheparinated circuit

Long term anticoagulation for the circuits

TCA: 2 to 3 times Control or Antixa

UFH 0.2 to 0.4 IU/ML

Asprin?

In cases where anticoagulation is contraindicated:

ECMO VV: possible in the long run without anticoagulation but monitor the formation of thrombi in the circuit, appearance of CIVD (indicates a macroscopically invisible thrombus or thrombus at the end of the cannulas). Shorter circuit lifespan.

Fluid Balance:

- Dry aspect
- Diuretics as soon as possible

Specific Monitoring :

- No specific biological surveillance apart from blood gases, hemoglobin, and antixa.
- Exercise vigilance if ECMO does not use anti-coagulation
 - ⇒ Thrombus in the oxygenation membrane

Withdrawal from VV ECMO:

- No minimum or maximum compulsory resuscitation time
- Healing of pulmonary pathology with progressive reintroduction of conventional assisted or controlled ventilation Vt 6 ml / kg, Pplateau <30 cm H₂O, PEEP 5-12 cm H₂O, FIO₂ <60%
- Stopping the flow (fresh gas flow = 0) / maintenance of ECMO blood flow
- If clinical signs and gas are stable after 1 to 4 h = decanulation
- Decanulation in bed with 30 min compression point.