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| **CANNULATION PROCEDURE** |

**Cannulation:**

PURPOSE:

To outline the ECLS team responsibilities during the ECLS cannulation procedure.

SUPPORTIVE DATA:

The cannulation procedure is an urgent procedure in an unstable patient, performed at the bedside. The patient must be carefully monitored during the procedure. The Pediatric surgeon or CT surgeon will perform the procedure, the ECLS neonatologist, pediatric intensivist or anesthesiologist will administer the anesthesia, and the circuit will be connected by the Primer. The scrub nurse and circulator will be OR personnel.

EQUIPMENT LIST:

* OR equipment including Bovie.
* ECLS cannulae, 8-23 Fr venous and 8-23 Fr arterial for VA or 13 (Origen), (13, 16, 19, 23, 26, 27, 31) Avalon/Origen for double lumen VV
* ECLS cannulae connectors
* Heparin.
* Fentanyl.
* Rocuronium.
* PRBCs, platelets.
* Surgical light from PICU storeroom.
* Eye and mucus membrane protection masks.
* Suction canister exclusive for OR staff.
* EPIC conscious sedation flow sheet

STEPS:

* Turn up audio signal on cardiac monitor.
* Remove all unnecessary equipment and machinery from the bedside
* Once OR packs are opened, caps and masks to be worn by personnel.
* Position the patient with head to the left.
* Place x-ray plate under patient, including the head, neck and chest.
* Give Rocuronium, ensuring muscle paralysis and to block vagal response from the Fentanyl.
* Give Fentanyl 10 mcg/kg slowly over 1-2 minutes.
* Obtain baseline ACT on patient before heparin is administered.
* When the vessels are exposed give 100 units/kg heparin and wait 2 minutes before inserting cannula.
* If patient is not on ECLS within 30 minutes of initial heparin bolus, an additional bolus of heparin 25-50 units/kg may be needed. Patient’s ACT will help determine this.
* With the insertion of venous cannula, pressure may be applied to the liver to promote venous return and cannula filling.

DOCUMENTATION:

Record on EPIC Nursing Flow Sheet all procedures performed on patient, all medications and blood products given to patient and all other pertinent patient data. Record on ECLS Flow Sheet the time of cannulation, size of catheters inserted, patient tolerance of the procedure, date/time of all medications given to circuit, lab work obtained from the circuit and the time ECLS was initiated.

**Connecting to ECLS and Initiating ECLS:**

PURPOSE:

To outline the ECLS team responsibilities during the patient connection to and initiation of ECLS.

SUPPORTIVE DATA:

The ECLS circuit will already be primed according to “Priming the ECLS Circuit” procedure. The neonatologist, intensivist, or anesthesiologist will provide procedural sedation. The connection of cannulae to the ECLS circuit will be done by the surgeon and ECLS primer. Tie straps will be applied to the cannula-circuit junction connection by the surgeon, ECLS Physician or ECLS Primer. Once ECLS is initiated, the cannula connecting lines are secured to a “Christmas tree” or carefully to the patient’s bed to prevent dislodgement of the cannulae.

EQUIPMENT LIST:

* 1 primed ECLS circuit.
* Tie strap gun.
* Cable ties.

STEPS:

1. Observe cannulae being connected to ECLS circuit.

CARDIOHELP – Remove the venous inlet clamp, then slowly remove the arterial clamp as you increase RPMs

1. Slowly increase RPMs while observing pump pressures, SVO2 and patient vitals.
2. Increase RPMs to achieve maximum flow over 15 minutes or according to physician orders to 80% of cardiac output (estimated at 120 ml/kg/min).
3. Give volume per ECLS Physician according to Administration of Blood Products into the ECLS circuit procedure.
4. After patient is stabilized on desired ECLS RPMs, infuse platelets to the patient over 5-10 minutes as ordered.
5. Provide tie strap gun and cable ties to ECLS Physician or Primer.
6. Observe tie strapping of circuit and cannula.

On VA ECLS the arterial tracing must be watched closely as the pump flow is increased. The tracing should begin to dampen as 100-150 ml/kg/min of flow is achieved. **Monitoring of SvO2, base excess, serum lactate and cerebral oximetry may be used as a guide for blood flow adequacy.**

Once the patient has been on ECLS for 5 minutes, an ACT should be checked. The heparin infusion is started when the ACT drops to <350 seconds. The initial rate should be 25 units/kg/hr. The initial ACT may be high and can drop quickly. The ACT should be monitored every 30 minutes until stable within the desired range. Titrate heparin according to ECLS Heparin Management protocol. A full set of laboratory samples including coagulation tests, should be drawn once the patient has reached the target flow.

The circuit tubing should be securely anchored to the bed, after ty-banding all tubing connections.

Complete the ECLS initiation note in the patient’s medical record.