ECMO Cannulation and Retrieval Guidance for Referring Hospitals

Intensive Care Unit - ECMO – Retrieval Guidance

The purpose of this document is to briefly outline the cannulation procedure when the ECMO team arrives at your hospital and what they will ask for. We are aware this procedure is often unfamiliar to the theatre teams assisting us therefore, this information will hopefully assist with the preparations for each team and give guidance to help you prepare.

The team arriving at your hospital consists of an ECMO consultant, another member of medical staff and ECMO specialist nurses. All are very experienced in performing cannulation and retrieval and will be happy to answer any of your queries.

Where possible we would ask that ECMO cannulations are carried out in theatre if the patient's condition is stable enough to allow transfer. On some occasions cannulations can be undertaken within the ICU. Alternatively a cardiac catheter lab or interventional radiological suite will also be suitable.

This document contains a mobile ECMO preparation checklist, followed by more detailed instructions for the different members of your teams, to help you set up.

Any questions please contact our ECMO Co-ordinator on **07917068628**

MOBILE ECMO PREPARATION CHECKLIST

Please ensure were possible the following are ready for the ECMO team's arrival…

Intensive Care Unit

Next of Kin aware of retrieval and where possible available	☐
Supply of current Infusions for the return journey prepared in 50ml syringes please	☐
Photocopies of the patients casenotes	☐
Medical discharge letter	☐
Nursing transfer letter	☐
Portable ventilator and monitor ready to transfer patient to theatre	☐
Cross matched for 2units RBC	☐

Theatre

Theatre available	☐
Theatre team – Scrub nurse, Anaesthetist, ODP, Runner	☐
Radiographer	☐
C-arm (theatre table adjusted to allow C-arm to image groin to chest)	☐
Ultrasound machine	☐
Large trolley	☐

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INTENSIVE CARE UNIT TEAM

1. Please cross match two units of blood for the patient – other clotting products may be requested by the ECMO team depending on blood results.

2. Ensure the Next of Kin is aware of plans for ECMO retrieval and where possible are present on the team's arrival to allow discussion.

3. Prepare for theatre transfer
    a. portable monitor
    b. ventilator (ICU ventilator preferred if moveable)
    c. appropriate sedation and transfer drugs ready
    d. local pre-theatre (WHO) checklist completed

4. Draw up spare infusions for two hours in theatre and twice the transfer time back to Aberdeen Royal Infirmary. All transfer infusions need to be made up into 50ml syringes please. If patient is not on any vasoactive support, please prepare one 50ml syringe of noradrenaline for transfer.

5. Paperwork - Medical, nursing discharge letters and photocopies of all relevant notes and results of investigations.

THEATRE TEAM

1. Theatre personnel needed:
    a. Anaesthetist
    b. Scrub nurse
    c. ODP/runner
    d. Radiographer

2. All those staying in theatre will need to wear x-ray lead protection throughout the procedure.

3. We will bring all necessary cannulation equipment but in addition will need:
    a. Sterile trolley
    b. Ultrasound machine for vascular access (Sonosite or similar)
    c. Local WHO checklist

4. Theatre table must be configured so the C-arm is able to image the patient from the groin to their chest (this may require the table to be positioned the 'wrong way' around).

5. Patients do not require warming or diathermy for the procedure.

ANAESTHETIST

1. Responsible for providing anaesthesia and titration of inotrope/vasopressor infusions until the patient is safely established on ECMO and ECMO consultant de-scrubbed.

2. Heparin bolus
    a. All patients require a heparin bolus of 50units/kg at cannulation – this will be prepared for you by our ECMO specialist nurses.
    b. You will be asked to administer the heparin at the correct point of cannulation by the ECMO consultant.
    c. Please notify the ECMO consultant when heparin has been administered, to ensure this has been given before the ECMO cannula is advanced.

3. Ensure two units cross-matched blood are available in the theatre blood fridge.

4. Patients can drop their blood pressure immediately post ECMO cannulation or over the following 30 minutes. Please have emergency drugs available and IV fluids primed and ready to administer.

If the patient is unstable post cannulation, we may require a transthoracic echo machine for urgent further assessment

SCRUB NURSE

1. The scrub nurse will be asked to assist during cannulation – we understand that you will not have seen this procedure before and will talk to procedure through with you.

2. Femoral-Femoral cannulation involves a Seldinger technique to access bilaterally the patient's femoral veins. This is done using ultrasound guidance and short 6 Fr sheaths are deployed to secure femoral access. Once both sides have secure access long guidewires are advanced under fluoroscopic guidance via each sheath one at a time. Once guidewires are passed up the inferior vena cava (IVC) and in a satisfactory position, the skin is then dilated up using a technique of serial dilation up to 24 Fr. Then the cannulas are advanced over the guidewires into position, this will be with the tip of the return cannula in the right atrium and the drainage cannula roughly 8-10cms below in the IVC.

3. The most important role of the scrub nurse is to control the guidewire and ensure its position does not move whilst we pass the serial dilators followed by the cannulas.

4. On rare occasions we will undertake a neck cannulation – this will involve one dual lumen cannula being inserted via the patient's right internal jugular vein, using a similar technique.

The whole procedure will be spoken through prior to commencing cannulation.

RADIOGRAPHER

1. Responsible for ensuring everyone within the theatre are wearing lead protection

2. The C-arm must be covered in a sterile field, we will have this with us, and able to image the patient from groin to chest

3. ECMO cannulation involves passing guidewires from bilateral femoral veins, up the inferior vena cava (IVC) to the heart.

4. The guidewire is placed under continuous fluoroscopic guidance – the ECMO consultant will ask you to screen and follow the tip of the guidewire until it is in the correct position.

5. Following skin dilation we may ask for a second check that the guidewire position remains correct which will involve screening from groin following the wire up to the patient's heart.

6. The cannulas are then placed over each of the wires and advanced one at a time. The return cannula will lie with its tip in the right atrium and the drainage cannula 8-10cm lower than this in the IVC under fluoroscopic screening – we will ask you to follow each of the cannulas tip from insertion at the groin up to ensure correct placement.

7. Finally a screen shot of the cannula position at the end will be asked to be saved and uploaded to the national PACS system.

THEATRE CONFIGURATION