



ECMO Committee (Policy No 2)

Extracorporeal Membrane Oxygenation (ECMO) Transport POLICY 2017

Policy owner: ECMO Committee. MOH	Applies to: All Staff in MOH and private Hospitals in Kuwait
Section Location: Departments of Anaesthesia, Adult Intensive Care and Pain Management in all MOH and private Hospitals in Kuwait.	Effective date: 01-11-2017 Revision date: 01-11-2020
Approved by: Head of ECMO committee, ECMO committee members	
Final Approval by: MOH Undersecretary	

Purpose:

- 1- To provide the regulations and process for transfer of ECMO patients and all staff involved in the management of ECMO patients during intra and inter-hospital transfer to and from any governmental or private hospitals in the state of Kuwait.
- 2- To determine the roles and responsibilities of each member of the ECMO team.
- 3- To determine the necessary equipment and other products needed for ECMO transport.

Definitions

1. "Primary Transports" - - situations in which the transport team is required to perform cannulation for ECMO support at the referring facility and then transport the patient to an ECMO centre.

Introduction

The VV-ECMO service for severe respiratory failure can be provided for any patient in any health institution in the State of Kuwait, both private and governmental as per indications stated in the ECMO referral policy. Currently it is only provided by certain ECMO centres in Kuwait as a tertiary care service with Adan Hospital being the main centre for referral till other centres starts to develop.

As patients may need the ECMO service in any hospital in Kuwait (both private and governmental) and most of these hospitals lack the experience and the skills in establishing ECMO, An ECMO team has been established in order to travel to the unstable patient in their hospital to insert the cannulas and establish the pump and escort the patient back to the ECMO centre where further management of the patient will be taking place (primary transport). For stable patients, they can be transported to the ECMO centre by the referring team where ECMO will be inserted there.

This policy will outline the process for transport to the ECMO centre, provided it is accepted by the ECMO consultant, and the different roles and responsibilities of each member of the ECMO team.

Section 1: ECMO Transport requirement

A- Indications for transport

Patients with Refractory hypoxemia/hypercapnia (failure of mechanical ventilator support) requiring ECMO are candidates for ECMO primary transport by the ECMO team bearing in mind the following:

- i. The Unacceptable risk of deterioration during conventional transport is decided by the managing physician in their best clinical judgment.
- ii. Patients who are STABLE and fit the criteria for ECMO insertion, or who maybe candidates for ECMO insertion can be transported by the referring team to the ECMO Centre after being accepted by the ECMO consultant.

B- Planning for ECMO transport

1. The transport mission includes transport of the whole ECMO team from their Hospital (the ECMO Centre) to the referring facility, followed by transport of the patient back to the ECMO centre (currently Adan ICU).
2. Transport of the team from the ECMO Centre is done via the special ICU transport vehicle(booked by the ICU nurse via transportation department).The transport vehicle will collect the whole team from the ECMO Centre, in addition to all the necessary equipment needed for the ECMO insertion, and transport them to the referring hospital.
3. Once the ECMO is inserted in the referring hospital, the patient with the ECMO team will be transported back to the ECMO Centre via the special ICU ambulance. The ICU nurse in the ECMO centre should contact the ICU ambulance once the patient is accepted for the ECMO service by the ECMO consultant in order to avoid any delays in sending the ambulance to the referring hospital. To book the ambulance follow the following steps:
 - a- Call 132, or alternatively, call direct line (24792175, 24792177)
 - b- Call oncall head number (24792161) if no reply from the above numbers.
 - c- Provide the following details
 - name of ICU nurse booking the ambulance
 - Adan ICU phone number and Adan ICU SR oncall number (96623263)
 - Name of the referring hospital and location of the patient. (e.g. AlSabah.H. ICU)
 - Name of the ECMO centre where the patient will be transported to
 - The reason for the request of the ICU ambulance (e.g. ECMO patient)
 - d- Request the special ICU ambulance (**AMBULANCE NUMBER 54**) and state it is an **URGENT** request.
 - e- Take the details of the person answering the call including name and phone number to communicate to them any future messages relating to the transport.
 - f- Book the ICU ambulance as soon as possible after accepting the referral to avoid delays in sending the ambulance to the referring hospital.
- 4- If some of the ECMO insertion equipment that were transported from the ECMO Centre could not be accommodated in the ICU ambulance, they should be transported via the special ICU transport vehicle (see point 2 above). The vehicle can also transport any of the staff that could not be accommodated in the ICU ambulance.
- 5- All members of the ECMO team (doctors, nurses, perfusionists, ambulance crew) will be allowed to leave their base hospital and provide the ECMO service in any hospital in Kuwait. This is exceptional situation which is not usual but will be allowed as it is lifesaving.

Section 2: ECMO Transport Team Roles and responsibilities

The basic team members include the ICU ECMO consultant, ICU ECMO SR or registrar, ECMO nurse and ICU bed side nurse, and the perfusionist. The clinical scenario, cannulation setting, and the duration or complexity of the transport may dictate the inclusion of additional team members, such as additional nurses or physicians/ cardiac or vascular surgeons, RT ect.... The following are the minimum responsibilities of the ECMO transport team members:

A- ICU ECMO Consultant

Adan ICU ECMO consultant will be responsible for receiving the referrals, assessment, and approval of all patients referred for VV-ECMO from Adan Hospital or any other hospital (private or governmental) in Kuwait. The ICU ECMO consultant is also responsible for the overall management of the ECMO patient once accepted for VV-ECMO. Their roles and responsibilities include the following:

- Accepting the patient for starting the ECMO after confirming the suitability and the indication
- Cannulation or supervision of cannulation by the ICU SR
- Initial ECMO parameters setup and further parameter changes
- Retrieval of the patient if unstable for transfer
- Daily review of all ECMO patients
- Medical reference for all other ECMO staff
- Involvement in all key decision making (e.g. weaning, withdrawal of therapy, bleeding and other complications management)
- If percutaneous approach is not possible, open approach by a cardiac surgeon or vascular surgeon is attempted. The surgeon can be from the ECMO Centre or in some circumstances, the ECMO team may choose to work with a surgeon and surgical team from the referring hospital if such collaboration facilitates timely patient transfer.

B- ICU ECMO SR/Registrar

- Insertion and removal of the percutaneous cannula under supervision of the ECMO consultant.
- Administration of heparin bolus at time of cannulation
- Administration of any needed deep sedation/analgesia
- Management of mechanical ventilation, vasoactive infusions, etc
- General management of the ECMO patient and ECMO circuit under the supervision of the ECMO consultant.
- Be familiar with all the complications that may develop and its management.
- Retrieval of the patient if unstable for transfer
- Primary responsibility for ensuring all equipment on checklist is functional and loaded at time of departure

C- Perfusionist

The perfusionist will provides 24 hr cover for:

- Priming of circuits and Initiation of ECMO

- Circuit maintenance and nursing support
- Assists with blood gas analysis, circuit blood sampling per team policy
- Retrieval of the patient if unstable for transfer
- Three times daily review of patients on ECMO
- Attendance for all inter and intra-hospital transport of patients
- Attendance at all procedural interventions.

D- ICU ECMO Nurse

All patients on ECMO require overview by a second ECMO nurse, in addition to a dedicated bedside nurse. 24 hour nursing cover is required to:

- Maintain a safe environment for the management of a critically ill, ventilated patient with a wide range of complex care needs.
- Administers medications, fluids, and blood products, and assists in patient assessment
- Ensure safe monitoring of the ECMO patient including monitoring all the ecmo parameters as illustrated in the ECMO monitoring form ([appendix I](#)).
- Immediate call to the medical staff and perfusionist whenever any of the parameters are outside the determined range indicated by the ECMO consultant as documented in the ECMO monitoring form.
- Be familiar with the different kits needed for the ECMO cannulation as per the ECMO equipment list ([appendix II](#)) which should be all available in the ECMO Cart and ensuring its availability and replacement whenever it's been used.

E- Transport Respiratory Therapist

- If the ICU ambulance space allows, ideally a transport respiratory therapist will accompany ECMO transport team.
- Primary responsibility for ventilator set-up and management, gas connection/disconnection, ventilator trouble-shooting
- If space/team configuration does not allow, then ICU ECMO nurse and ICU ECMO SR/registrar must be able to execute these tasks competently

F- Cardiac surgeon/vascular surgeon

- Responsible for surgical cannulation if percutaneous approach fails and open approach is required.

Section 3: Equipment for ECMO Transport

See Appendix II.

References

1. Clinical Guideline. Extracorporeal Membrane Oxygenation (ECMO) for acute respiratory failure. Guy's and St Thomas NHS Foundation Trust. October 2011. Dr Nicholas Barrett.
2. Clinical Guideline. Veno-arterial Extracorporeal Membrane Oxygenation (VA-ECMO) for acute severe cardiac failure. Guy's and St Thomas NHS Foundation Trust. Dr Nicholas Barrett.

APPENDIX I (ECMO Monitoring Form)

Patient Name

CID No.

Bed No.

ECMO Monitoring Form

(3 hourly observation unless stated otherwise)

DATE									
TIME									
FLOW									
RPM									
Sweep Gas Flow/FiO2									
P-Ven (P1)									
P-Art (P3)									
Del-P (P2-P3)									
ACT (6 hourly)									
APTT (6hourly)									
D-D/fibrinog(daily)									
PLATELETS									
Heparin Infusion									
Hb									
LDH/Triglyceride(daily)									
Heart Rate									
MAP									
CVP									
CO / CI									
PWP									
SPO2									
Ph									
PcO2									
PO2									
Hco3									
B.E									
SaO2									
Lac									
K+									
VENTI-FiO2									
PIP									
PEEP									
Plateau									

Targets to be filled daily by the ECMO consultant (please specify targets if different from the set value.

(IF OUTSIDE THE DETERMINED RANGE, CALL THE DOCTOR IMMEDIATELY)

Flow ----- L/min	MAP ----- (65-80mmHg)	Platelets -----(>50)	PIP ----- (5-10)
ECMO FiO2 -----	CVP ----- (10-14mmHg)	Fibrinogen -----(>1.5)	PEEP ----- (10-15)
Sweep gas flow ----L/min	HR -----(50-70bpm)	ACT----- (140-170)	Plateau ----- (< 25cm H2O)
Heparin ----- ml/min	CO ----- (4-5L/min)	APTT----- (40-60s)	
ACT ----- (140-170)	CI ----- (2.2-2.5L/min)	Heparin----- (ml/min)	
APTT ----- (40-60s)	PWP ----- (14-16mmHg)		

Other instruction:

Adan ICU. Updated July 2017.

APPENDIX II (ECMO Disposables List)

SL.NO	DISPOSABLES	STOCK
1	DRESSING SET	4
2	ANGIO STERILE DRAPE	2
3	CHLORHEXIDINE(70%ALCOHOL+2% CHLORHEXIDINE)	3
4	HIBISCRUB	1
5	50 CC BLADDER SYRINGE (CATHETER TIP)	10
6	20 CC SYRINGE	10
7	10 CC SYRINGE	10
8	5 CC SYRINGE	10
9	MERSILK SUTURE'0'	8
10	MERSILK SUTURE'1'	8
11	CUTDOWN SET	2
12	SALINE 0.9% (500 ml)	3
13	AMPLATZ EXTRA STIFF GUIDE WIRE(145CMX4)	2
14	AMPLATZ EXTRA STIFF GUIDE WIRE(80CMX2)	2
15	AMPLATZ EXTRA STIFF GUIDE WIRE(260CMX2)	2
16	COON TAPER DILATERS 9-24FR(Maquet dilator)	2
17	CORDIS 6FR VASCULAR SHEATH	2
18	TEGADERM 20X30	1 BOX
19	ULTRASOUND PROBE COVER	2
20	ULTRASONIC GEL	2
21	SURGICAL BLADE WITH HANDLE	2
22	STERILE GAUZE PACKT(10CM X 10CM)	4
23	BIOPATCH 4MM X 2	2
24	BIOPATCH 7MM X 4	4
25	VIDENE ANTISEPTIC SOLUTION	4
26	VENOUS CANNULA 21FR	1
27	VENOUS CANNULA 23FR	1
28	VENOUS CANNULA 25FR	1
29	ARTERIAL CANNULA 17FR	1
30	ARTERIAL CANNULA 19FR	1

31	ARTERIAL CANNULA 21FR	1
32	AVALON CANNULA 27 FR	1
33	AVALON CANNULA 31 FR	1
34	iLA active XLung Kit	1
35	iLA active MiniLung Kit	1
36	HLS 7	1

REUSABLES

SL. NO	REUSABLES	QTY
1	NEEDLE HOLDER(Large)	3
2	ARTERY FORCEPS(Large)	2
3	SCISSORS(Large)	2
4	CLAMPS(NARROW)	6
5	CLAMPS(WIDE)	9
6	GALLIPOT	2
7	MUG	1
8	STEEL TRAY	1



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وكيل وزارة الصحة بالإتابة

MOH Undersecretary

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Date: