# Management of surge and escalation in critical care services: standard operating procedure for adult respiratory extra corporeal membrane oxygenation

NHS England and NHS Improvement

# Contents

# Introduction and context

The focus of this document is to set out the background, principles and processes for the management of surges in demand for adult respiratory extra corporeal membrane oxygenation (ECMO). As a nationally commissioned highly specialised service, the management of surge and escalation for adult respiratory ECMO services is a national process rather than a regional process that escalates to a national level.

Respiratory ECMO is indicated for acute severe but potentially reversible respiratory failure. Aetiologies include, but are not limited to, pneumonia, acute respiratory distress syndrome, pulmonary aspiration, large airway disease or disruption and COVID-19.

This Standard Operating Procedure (SOP) forms part of a suite of NHS England published SOPs that cover the following services:

- Adult critical care services
- Paediatric intensive care services
- Burns services (adults and children)
- Adult respiratory extra corporeal membrane oxygenation (ECMO) services
- Paediatric respiratory extra corporeal membrane oxygenation (ECMO) services

(https://www.england.nhs.uk/commissioning/ccs/)

It is recognised that:

- There are mutual interdependencies between these services and the critical care and intensive care resource they each use; and
- Surge pressures are not solely linked to winter and can occur at any time of year.

In the context of this SOP, the term **surge** is used to describe pressure on the whole adult respiratory ECMO system rather than referring to surge pressure experiences within an individual Adult Respiratory ECMO Centre.

All capacity reporting and bed management will use, as its basis, the NHS Pathways Directory of Services (Pathways DoS) system to monitor the bed availability for adult and adult respiratory ECMO services in England and Scotland. Wales and Northern Ireland utilise the respiratory ECMO beds in England and Scotland but are not involved in the surge and escalation processes.

Each of the commissioned Adult Respiratory ECMO Centres are routinely commissioned to provide capacity for up to 3 patients under normal conditions which can be increased under surge conditions. It should be noted that capacity can be flexible depending on activity within other interdependent services and should be considered as a guide.

# 1. Purpose

The SOP sets out:

- A consistent national approach for England and Scotland by which providers of the services covered by this document can escalate capacity pressures to their commissioners in NHS England and NHS Scotland.
- How the services covered by this document and the stakeholders should act;
- The process for the identification of current and potential capacity for the services covered by this document; and
- The anticipated escalation process nationally across the NHS in England, in support of the services covered by this document (including the NHS Strategic Command arrangements to be implemented by NHS England should they be required).
- The approach to supporting NHS England Emergency Preparedness, Resilience and Response (EPRR) planning in relation to any incident, event or outbreak of disease that may result in the need for treatment by a specialist adult respiratory ECMO Centre.
- The NHS England reporting and governance structures in place for the service with specific reference to the COVID-19 pandemic response.

All processes described take account of the specific commissioning arrangements for the services covered.

In the event of a surge in demand identified via the NHS Pathways Directory of Services (Pathways DoS) system daily monitoring system or via alerts through the secure messaging application (PANDO) from the adult respiratory ECMO centres, the Adult Respiratory ECMO Lead (the ARE Lead) coordinates NHS England's response. All surge issues should be referred to the ARE Lead in-hours or NHS England EPRR Team out of hours (see Appendix 3)

# 2. Strategic aim

The strategic aims of this document are for the services covered by this document to:

- Prevent avoidable mortality and morbidity due to patients requiring care and not being able to access this in a timely manner;
- Maximise capacity in the health and social care system in a range of scenarios through a coordinated escalation and de-escalation approach across geographical footprints; and
- Support national coordination of triage and prioritisation during periods of escalation.
- Ensure accurate and systematic data reporting to support service planning and response to all stages of surge and escalation to enable national co-ordination of care for patients (where required).

Support for repatriation of patients able to be discharged is at the centre of arrangements. This is to ensure that the maximum use is made of the highly specialised adult respiratory ECMO services.

**Appendix 2** gives detail about adult respiratory ECMO, the indications for its use, criteria for referral and contraindications.

# 3. Target audience

The primary audiences for this document are:

- Those involved in planning adult respiratory ECMO services;
- Others involved in the oversight of specialised services in NHS England;
- Those involved in strategic command arrangements out-of-hours in NHS England (i.e. EPRR staff);
- Providers of adult respiratory ECMO services and identified surge centres; and
- Communications staff.

Given the small number of providers of adult respiratory ECMO services, surge demand is managed on a national (rather than regional or local) basis.

# 4. Surge and escalation management arrangements

This section sets out the roles and responsibilities to be undertaken at times of surge pressure. The information in this section is incorporated into a series of action cards shown at **Appendix 1.**

The following sections describe actions in **pre-surge**, **surge**, **escalation** and **heightened escalation**.

This SOP would apply for any surge situation, including COVID-19, pandemic influenza, or mass casualty events. In a mass casualty event, there may need to be a specific urgent call. This will be organised by the Adult Respiratory ECMO (ARE) Lead as necessary.

## 4.1 Pre-surge phase

During **pre-surge** periods when there are likely to be bed capacity issues (for example, between 1 November and 31 March and/or when there are pandemics but accepting that surge can happen at any time of the year), the ARE Lead in-hours convenes a weekly video/teleconference to discuss bed availability and potential issues.

The calls take place **every Monday at 14.30** and the individuals taking part include:

- A representative from each of the six centres (the five Adult Respiratory ECMO Centres in England and the Adult Respiratory ECMO Centre in Scotland).
- The ARE Lead in-hours or their deputy (Chair)
- A representative from National Services Division, Scotland (who commissions the adult respiratory ECMO in Scotland)
- A member of the NHS England Emergency Preparedness and Rapid Response (EPRR) Team (as required)
- Public Health England representative (as required)
- A member of the NHS England Urgent and Emergency Care Team (as required)

The weekly video/teleconference covers:

- An update of bed capacity from each of the six centres; and
- Potential issues and a discussion of possible solutions

When an Adult Respiratory ECMO Centre is unable to take part in a teleconference, they will e-mail the ARE Lead information to supplement the posted bed status in the NHS Pathways Directory of Services (Pathways DoS) system. This ensures that a complete national picture can be determined at the teleconferences. Accurate and systematic data capture is important to support service planning and response to all stages of surge and escalation.

The ARE Lead in-hours circulates a brief note of the meeting to all adult ECMO centres and others taking part in the teleconference. The ARE Lead may liaise with NHS England regional staff if, for example, there is an indication that adult respiratory ECMO capacity issues may impact on other services, or if there are specific repatriation issues highlighted.

All centres and wider participants will be advised of the video/teleconference details in advance.

In addition, a secure messaging application (PANDO) will be used to support group communications across the service and to share notifications.

The ARE Lead in-hours sends an e-mail to the ARE Lead out-of-hours every Thursday at 16.00 (or before any bank holiday period) and the ARE Lead out-of-hours sends an e-mail to the ARE Lead in-hours every Monday at 08.00 (or following any bank holiday period). The e-mail either:

a) confirms that there are no known issues; or
b) details potential issues and what has been discussed in terms of possible solutions; or
c) details known issues and what has been put in place as a consequence.

## 4.2 Surge phase

The **surge** point is defined as the point at which **respiratory ECMO bed occupancy exceeds 25 nationally** and centres are required to respond to an increase in demand. During this period of moderate demand Centres may need to flex capacity and staff within ICU to manage additional ECMO patients. This position is confirmed by the ARE Lead in-hours.

Should the surge point be reached in-hours, the ARE Lead in-hours:

- Reviews the bed status information from the NHS Pathways Directory of Services (Pathways DoS) / secure messaging application (PANDO).
- Convenes a video/teleconference with the six centres (and the other attendees of the weekly teleconferences where feasible)
- Confirms that the surge point has been reached
- Agrees that surge capacity should be made available
- Agrees how the surge point will be monitored, for example, through frequent teleconferences

- Ensures that the EPRR Team and specialised services critical services cell is aware of the situation
- Communicates information to NHS England staff as appropriate
- Agrees a communications plan as appropriate
- Follows up any repatriation issues with staff in NHS England, once local escalation between the Adult Respiratory ECMO Centre and the hospital to which a patient who no longer needs adult respiratory ECMO could be repatriated
- Confirms when a surge episode is reached and what 'next steps' are required. Liaises with the national Clinical Programme Director, Specialised Commissioning, and severe COVID response cell to formally contact the Chief Executives of the Adult Respiratory ECMO Centres to inform them that the surge point has been reached and that there may be a need to identify additional adult respiratory ECMO capacity.

The ARE Lead in-hours is responsible for liaising with other NHS England staff to ensure that the agreed actions are implemented alongside the agreed communications plan.

The ARE Lead in-hours decides either:

a) The surge point has passed, and pre-surge arrangements can be reinstated; or
b) surge arrangements have been exhausted and the escalation point has been reached.

Should the surge point be reached out-of-hours, the centres follow the pathway in line with the agreed flow chart and communicate the position to the ARE Lead in-hours so that any further actions can be followed up.

## 4.3 Escalation phase

The **escalation** phase is defined as the point at which **respiratory ECMO bed occupancy exceeds 50 nationally**. During this period of high demand Centres will need to flex capacity and staff within ICU to manage additional ECMO patients. Enhanced monitoring will be required. Increased levels of activity may start to impact on other services delivered by the Trusts. This position is confirmed by the ARE Lead.

Centres will be required to take up to 10 patients during surge periods. Where demand and service pressures are such that this needs to be exceeded it will be discussed at the teleconferences and plans will be agreed to ensure continued access to the service for patients requiring ECMO.

Once the escalation point is reached, the ARE Lead:

- Reviews the bed status information from the NHS Pathways Directory of Services (Pathways DoS) / secure messaging application (PANDO).
- Convenes a video/teleconference with the six centres (and other NHS England and NHS Scotland staff as appropriate)

- Confirms that the escalation point has been reached
- Agrees what other actions should be instigated, for example, temporary suspension of elective activity
- Agrees how the escalation point will be monitored, for example, through daily video/teleconferences
- Ensures that the EPRR Team, specialised services critical services cell and severe COVID response cell is aware of the situation
- Communicates information to NHS England staff as appropriate
- Agrees a communications plan as appropriate
- Formally contact the Chief Executives of the Adult Respiratory ECMO Centres to inform them of the arrangements that have been put in place to manage and indicate that there will be a need to identify additional adult respiratory ECMO capacity. As part of this communication any issues relating to the need for the temporary suspension of elective surgical targets will be addressed.
- Contact the Chief Executives of the identified Adult Respiratory ECMO Surge Centres to alert them of rising demand and request that they make preparations to accept patients if demand continues to increase.

The ARE Lead, is responsible for liaising with other NHS England staff to ensure that the agreed actions are implemented alongside the agreed communications plan.

## 4.4 Heightened Escalation phase

The **heightened escalation** phase is defined as the point at which **respiratory ECMO bed occupancy exceeds 80 nationally**. During this period of high demand Centres will need to flex capacity and staff within ICU to manage additional ECMO patients. Enhanced monitoring will be required. Increased levels of activity will impact on other services delivered by the Trusts. This position is confirmed by the ARE Lead.

Additional commissioned surge capacity will be introduced, and enhanced monitoring will be in place.

Once the heightened escalation point is reached, the ARE Lead:

- Reviews the bed status information from the NHS Pathways Directory of Services (Pathways DoS) / secure messaging application (PANDO).
- Convenes a video/teleconference with the six centres and two surge centres (and other NHS England and NHS Scotland staff as appropriate)
- Confirms that the heightened escalation point has been reached
- Agrees what other actions should be instigated, for example, temporary suspension of elective activity
- Agrees how the heightened escalation point will be monitored, for example, through daily video/teleconferences

- Ensures that the EPRR Team, specialised services critical services cell and severe COVID response cell is aware of the situation
- Communicates information to NHS England staff as appropriate
- Agrees a communications plan as appropriate
- Formally contacts the Chief Executives of the identified Adult Respiratory ECMO Surge Centres requesting that they start to accept patient admission as requested on behalf of the national respiratory ECMO service.

The ARE Lead, is responsible for liaising with other NHS England staff to ensure that the agreed actions are implemented alongside the agreed communications plan.

## 4.5 Recovery phase

The recovery phase is defined as the point at which surge and escalation phases have passed with pre-surge arrangements reinstated. This position is confirmed by the ARE Lead in-hours.

Once the recovery point is reached, the ARE Lead in-hours:

- Prepares a debrief following any escalation phases, including recommendations for improvement in the SOP
- Discusses post-escalation debriefs at the weekly teleconferences
- Implements any changes agreed as a result of post-escalation debrief

**Phase Summary**

| | Occupied respiratory ECMO beds | Actions | Monitoring requirements |
|---|---|---|---|
| **Pre-surge** | **Up to 25** | Business as usual. | Call frequency – weekly |
| **Surge** | **26-50** | Expected winter pressures – within winter planning assumptions.<br><br>Advise the specialised services critical services cell. | Call frequency – x2 week (or more if required)<br><br>Notification updates via secure messaging application (PANDO). - daily |
| **Escalation** | **51-80** | Exceeding expected winter pressures.<br><br>Enhanced monitoring and reporting.<br><br>Alert identified surge centres of increased demand particularly noting requirement to 'be prepared' to admit if rate of increase is rapid.<br><br>Increased national and regional commissioning input may be required. | Call frequency – daily<br><br>Notification updates via secure messaging application (PANDO). - daily |

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| | | Inform the specialised services critical services cell.<br><br>Alert the severe COVID response cell. | |
| **Heightened escalation** | **81-120** | Additional commissioned surge capacity to be introduced.<br><br>Enhanced monitoring and reporting will be in place.<br><br>Enhanced national and regional commissioning support will be required.<br>Inform the specialised services critical services cell.<br><br>Alert the severe COVID response cell. | Call frequency – daily<br><br>Notification updates via secure messaging application (PANDO). - daily |

# 5. Interdependencies/ links with other services

Critical Care Networks should prioritise repatriation of all patients to create capacity in Adult Respiratory ECMO Centres. Regional leads should support the repatriation of patients during surge and escalation, accepting that repatriation may not be to the originating Trust. If repatriation is delayed for more than 24 hours, and the Adult Respiratory ECMO Centre has escalated locally the ARE will formally communicate with the Chief Executive of the Trust to which the patient is being repatriated to facilitate repatriation.

As part of the COVID-19 operating model for winter 2020/21, the adult respiratory ECMO service forms part of the NHS England Specialised Services Critical Services Cell and Severe COVID Response sub cell structure.

## 5.1 Appendix 1: action cards

| ADULT RESPIRATORY ECMO SERVICES<br>STANDARD OPERATING PROCEDURE<br>ACTION CARD | | |
|---|---|---|
| Role | 1.1 ADULT RESPIRATORY ECMO CENTRES<br><br>The role of the Adult Respiratory ECMO Centre is to: | |
| 1 | Complete/update the NHS Pathways Directory of Services (Pathways DOS) system / secure messaging application (PANDO). | |
| 2 | Ensure the safety of patients at all times escalating concerns about clinical safety arising from capacity constraints to NHS England. | |
| 3 | Take part in all scheduled teleconferences reporting service demand, bed capacity and highlight any known issues. Instigate other actions, in line with the agreed protocol. | |
| 4 | E-mail bed availability status to the Adult Respiratory ECMO Lead when unable to take part in teleconferences | |
| 5 | Follow up any repatriation issues through local governance routes and escalate to NHS England if local governance routes are not successful | |

| ADULT RESPIRATORY ECMO SERVICES<br>STANDARD OPERATING PROCEDURE<br>ACTION CARD | | |
|---|---|---|
| Role | **1.2 NHS ENGLAND ADULT RESPIRATORY ECMO LEAD IN- HOURS – PRE-SURGE**<br><br>Pre-surge is defined as: the period during which there are likely to be bed capacity issues (for example, between 1 November and 31 March and/or when there are pandemics but accepting that surge can happen at any time of the year).<br><br>In-hours is defined as: between the hours of 09.00 and 17.00 from Monday to Friday (except bank holidays).<br><br>The role of the Adult Respiratory ECMO (ARE) Lead in-hours during pre-surge is to: | |
| 1 | Be responsible for the day-to-day management of the Standard Operating Procedure | |
| 2 | Review the standard operating procedure as necessary | |
| 3 | Convene and chair the weekly national teleconferences during periods when there are likely to be capacity issues. The calls take place every Monday at 14.30 and the participants include:<br>• A representative from each of the six Adult Respiratory ECMO Centres<br>• A representative from National Services Division, Scotland (who supports the designated adult respiratory ECMO in Aberdeen)<br>• A member of the NHS England EPRR Team (as required)<br><br>The weekly teleconference covers:<br>• An update of bed capacity from each of the six centres<br>• Potential issues and a discussion of possible solutions<br><br>Circulate a brief note of the meeting.<br><br>The ARE Lead in-hours is responsible for liaising with NHS England regional staff if, for example, there is an indication that adult respiratory ECMO capacity issues may impact on other services. | |

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| 4 | Send an e-mail to the ARE Lead out-of-hours every Thursday at 16.00 (or before any bank holiday period) to identify any support required out of hours. | |
| 5 | Confirm (in conjunction EPRR) when a surge episode is reached and what ‘next steps’ are required, by whom and the timescales for completion. | |
| 6 | Provide support to the ARE Lead out-of-hours during surge and escalation phases. | |

| ADULT RESPIRATORY ECMO SERVICES<br>STANDARD OPERATING PROCEDURE<br>ACTION CARD | | |
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| Role | 1.3 NHS ENGLAND ADULT RESPIRATORY ECMO LEAD IN-HOURS – SURGE | |
| | Surge is defined as: the point at which patient numbers exceed 25 nationally and centres are required to respond to an increase in demand. This position is confirmed by the Adult Respiratory ECMO Lead (ARE Lead) in-hours.<br><br>In-hours is defined as: between the hours of 09.00 and 17.00 from Monday to Friday (except bank holidays). | |
| | The role of the ARE Lead in-hours during surge is to: | |
| 1 | Be responsible for the day-to-day management of the Standard Operating Procedure | |
| 2 | Review the standard operating procedure as necessary | |
| 3 | In the event that the surge point is reached in-hours:<br>• Review the bed status information from NHS Pathways Directory of Services (Pathways DOS)<br>• Convene a teleconference with the six centres (and the other attendees of the weekly teleconferences where feasible)<br>• Confirm that the surge point has been reached<br>• Agree which surge capacity should be made available<br>• Ensures that the EPRR Team is aware of the situation<br>• Agree how the surge point will be monitored, for example, through frequent teleconferences<br>• Communicate information to NHS England staff as appropriate<br>• Agree a communications plan as appropriate<br>• Follow up any repatriation issues with colleagues in NHS England, once local escalation between the Adult Respiratory ECMO Centre and the hospital to which a patient who no longer needs adult respiratory ECMO could be repatriated<br>• Formally contacts the Chief Executives of the Adult Respiratory ECMO Centres to inform them that the surge point has been reached and that there may be a need to identify additional adult respiratory ECMO capacity.<br><br>The ARE Lead in-hours is responsible for liaising with other NHS England staff to ensure that the agreed actions are implemented alongside the agreed communications plan. | |

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| | The ARE Lead in-hours decides either:<br>a) The surge point has passed and pre-surge arrangements can be reinstated; or<br>b) surge arrangements have been exhausted and the escalation point has been reached. | |
| 4 | Send an update e-mail to the ARE Lead out-of-hours every Thursday at 16.00 (or before any bank holiday period) and more frequently as required. | |
| 5 | Confirm (in conjunction with EPRR) when a surge episode is reached and what 'next steps' are required, by whom and the timescales for completion. | |
| 6 | Monitor bed capacity on a daily basis when a surge episode is reached. | |
| 7 | Confirm when a surge episode has passed and pre-surge arrangements and monitoring can be reinstated. | |
| 8 | Provide support to the ARE Lead out-of-hours during surge phases. | |

| ADULT RESPIRATORY ECMO SERVICES<br>STANDARD OPERATING PROCEDURE<br>ACTION CARD | | |
|---|---|---|
| Role | **1.4 NHS ENGLAND ADULT RESPIRATORY ECMO LEAD OUT-OF-HOURS – PRE-SURGE**<br><br>Pre-surge is defined as: the period during which there are likely to be bed capacity issues (for example, between 1 November and 31 March and/or when there are pandemics but accepting that surge can happen at any time of the year).<br><br>Out-of-hours is defined as: between the hours of 17.00 and 09.00 from Monday to Friday, weekends and bank holidays.<br><br>The Adult Respiratory ECMO (ARE) Lead out-of-hours is the NHS England on-call EPRR Officer supported by the NHS England on-call Operations Director and working in collaboration with the EPRR and Operations Second on call | |
| | The role of the ARE Lead out-of-hours is to: | |
| 1 | Convene and chair the weekly teleconferences during pre-surge phases when the weekly teleconference falls on a bank holiday.<br><br>The calls take place every Monday at 14.30 and the individuals taking part include:<br>• A representative from each of the six centres<br>• A representative from National Services Division, Scotland (who supports the designated surge centre for adult respiratory ECMO in Aberdeen)<br>• Other members of the NHS England EPRR Team (as required)<br><br>The weekly teleconference covers:<br>• An update of bed capacity from each of the six centres<br>• Potential issues and a discussion of possible solutions<br><br>The ARE Lead out-of-hours circulates a brief note of the meeting. The ARE Lead out-of-hours may liaise with NHS England regional staff if, for example, there is an indication that adult respiratory ECMO capacity issues may impact on other services. | |

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| 2 | Ensure that any actions following the teleconferences are implemented when the weekly teleconference falls on a bank holiday. | |
| 3 | Send an update email to the ARE Lead in-hours every Monday at 08.00 (or after a bank holiday). | |
| 4 | Confirm (in conjunction with EPRR) when a surge episode is reached out of hours and what ‘next steps’ are required, by whom and the timescales for completion. | |
| | **EPRR and Operations Second on call** | |
| 5 | Confirm (in conjunction with the ARE Lead out-of-hours) when an escalation point is reached. | |

| ADULT RESPIRATORY ECMO SERVICES<br>STANDARD OPERATING PROCEDURE<br>ACTION CARD | | |
|---|---|---|
| Role | **1.5 NHS ENGLAND ADULT RESPIRATORY ECMO LEAD OUT-OF-HOURS – SURGE**<br><br>Surge is defined as: the point at which patient numbers exceed 25 nationally and centres are required to respond to an increase in demand This position is confirmed by the Adult Respiratory ECMO Lead (ARE Lead) out-of-hours.<br><br>Out-of-hours is defined as: between the hours of 17.00 and 09.00 from Monday to Friday, weekends and bank holidays.<br><br>The ARE Lead out-of-hours is the NHS England on-call EPRR Officer supported by the NHS England on-call Operations Director and working in collaboration with EPRR and Operations Second on call. | |
| | The role of the ARE Lead out-of-hours is to: | |
| 1 | Confirm (in conjunction with EPRR) when a surge episode is reached out of hours and what 'next steps' are required, by whom and the timescales for completion. | |
| 2 | In the event that the surge point be reached out-of-hours:<br>• ensure that the Adult Respiratory ECMO Centres follow the pathway shown at **Appendix 2** in line with the agreed flow chart; and<br>• communicate the position to the ARE Lead in-hours so that any further action can be followed up.<br><br>Communicate status and agree a communications plan as necessary. | |
| 4 | Monitor bed capacity on a daily basis when a surge episode is reached | |
| 5 | Liaise with the ARE Lead in-hours to enable comprehensive handover in normal working hours (as outlined above) and confirm key actions arising during the on call period in writing (via email). | |
| | **EPRR and Operations Second on call** | |
| 6 | Confirm (in conjunction with the ARE Lead out-of-hours) when an escalation point is reached. | |

| ADULT RESPIRATORY ECMO SERVICES<br>STANDARD OPERATING PROCEDURE<br>ACTION CARD | | |
|---|---|---|
| Role | **1.6 NHS ENGLAND ADULT RESPIRATORY ECMO LEAD IN-HOURS AND OUT-OF-HOURS – ESCALATION**<br><br>Escalation is defined as: more than 50 patients receiving ECMO across the network. During this period of high demand Centres will need to flex capacity and staff within ICU to manage additional ECMO patients. Enhanced monitoring is likely to be required. Increased levels of activity may start to impact on other services delivered by the Trusts. The position is confirmed by the Adult Respiratory ECMO (ARE) Lead in conjunction with EPRR. | |
| | The role of the ARE Lead is to: | |
| 1 | Confirm (in conjunction with EPRR) when the escalation phase is reached and what 'next steps' are required, by whom and the timescales for completion. | |
| 2 | In the event that escalation point is reached:<br>• Review the bed status information from the NHS Pathways Directory of Services (Pathways DOS)<br>• Convene a teleconference (which may be chaired by EPRR Clinical Advisor) with the six centres (and other NHS England and NHS Scotland staff as appropriate)<br>• Confirm that the escalation point has been reached<br>• Agree what other actions should be instigated, for example, temporary suspension of elective activity<br>• Ensures that the EPRR Team is aware of the situation<br>• Agree how the escalation point will be monitored, for example, through frequent teleconferences<br>• Communicate information to NHS England staff as appropriate<br>• Agree a communications plan as appropriate<br><br>The ARE Lead, in conjunction with EPRR, is responsible for:<br>• liaising with other NHS England staff to ensure that the agreed actions are implemented alongside the agreed communications plan<br>• agreeing how services will be monitored during the escalation period<br>• agreeing a communications plan as appropriate<br>• deciding when the escalation point has passed and surge arrangements can be reinstated. | |

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| | **EPRR and Operations Second on call** | |
| 3 | Confirm (in conjunction with the ARE Lead) when an escalation point is reached. | |
| 4 | Chair teleconferences during escalation phases | |
| 5 | Ensure (in conjunction with the ARE Lead) that any actions following escalation teleconferences are implemented. | |
| 6 | Act as the NHS England lead in the event of any media communications. | |
| 7 | Confirm (in conjunction with the ARE Lead) when an escalation point has passed and surge arrangements can be reinstated. | |

| ADULT RESPIRATORY ECMO SERVICES<br>STANDARD OPERATING PROCEDURE<br>ACTION CARD | | |
|---|---|---|
| Role | 1.7 NHS ENGLAND ADULT RESPIRATORY ECMO LEAD IN-HOURS AND OUT-OF-HOURS – RECOVERY<br><br>Recovery is defined as: the point at which surge and escalation phases have passed and pre-surge arrangements can be reinstated. This position is confirmed by the Adult Respiratory ECMO (ARE) Lead in-hours. | |
| | The role of the ARE Lead is to: | |
| 1 | Once the recovery point is reached:<br>• Prepare (in conjunction with EPRR), a debrief following any escalation phases, including recommendations for improvement<br>• Discuss post-escalation debriefs at the weekly teleconferences<br>• Implement any changes agreed as a result of post-escalation debrief | |

# 5.2 Appendix 2: background to adult respiratory ECMO including indications for its use, the location of ECMO centres and criteria for referral

Respiratory ECMO is indicated for acute severe but potentially reversible respiratory failure. Aetiologies include, but are not limited to, pneumonia, acute respiratory distress syndrome, pulmonary aspiration, air leak syndrome large airway disease or disruption and COVID-19. Referrals to the service should only be made by adult intensive care units for patients who are critically ill and already receiving lung protective mechanical ventilation or for patients in whom lung protective ventilation is not possible due to the severity of hypoxaemia/hypercapnia.

The Clinical guide for extra corporeal membrane oxygenation (ECMO) for respiratory failure in adults includes details of the service inclusion and exclusion criteria and should be reviewed prior to referral.

The service specification commissioned by NHS England includes:

- Patient retrieval by air or road, including mobile ECMO if necessary
- Assessment for respiratory ECMO
- Respiratory ECMO treatment
- Post ECMO trialling off and stabilisation
- End of life care on ECMO if necessary, including family support

**ECMO Centres**

There are five national ECMO centres commissioned to provide this service in England and one centre in Scotland.

**England**

- St. Thomas' Hospital, Guy's & St Thomas' NHS Foundation Trust
- Royal Papworth Hospital NHS Foundation Trust
- Royal Brompton Hospital, Royal Brompton & Harefield NHS Foundation Trust
- Wythenshawe Hospital, Manchester University NHS Foundation Trust
- Glenfield Hospital, University Hospitals of Leicester NHS Trust

**Scotland**

- Aberdeen Royal Infirmary, NHS Grampian

**Surge Centres**

In addition, three surge centres have been identified to support the service should there be excess clinical demand during periods of 'heightened escalation':

- Freeman Hospital, Newcastle Hospitals NHS Foundation Trust
- St. Bartholomew's Hospital, Barts Health NHS Trust
- King's College Hospital NHS Foundation Trust, London

**Referral**
All patient being considered for respiratory ECMO should be referred to the national referral portal https://www.signpost.healthcare/ecmo-referral-pathway

Once a referral has been made it will be reviewed by one of the national centres, who will contact the referring clinical team for further discussion regarding clinical management of the patient or admission to the service

If the patient meets the nationally agreed service criteria, the designated centre will arrange for a retrieval team to be deployed to the patient. If the patient does not meet the nationally agreed service criteria, advice for continued local clinical management will be provided.

The designated centres may transfer referrals to each other to support demand and capacity management within the service and during periods of 'heightened escalation' in the service referrals may be transferred to one of the identified surge centres.

NHS England also works very occasionally with the centre in Karolinska Institute, Stockholm, Sweden (under a reciprocal arrangement).

Any exceptional requests for funding to meet surge and escalation requirements should be addressed to the Adult Respiratory ECMO Lead in-hours.

## Appendix 3: Standard Operating Procedure for Identified Surge Centres

This appendix provides additional information in relation to the operational requirements for identified surge centres supporting the national service if the service experiences exceptional demand pressures.

**Pre-requisites:**

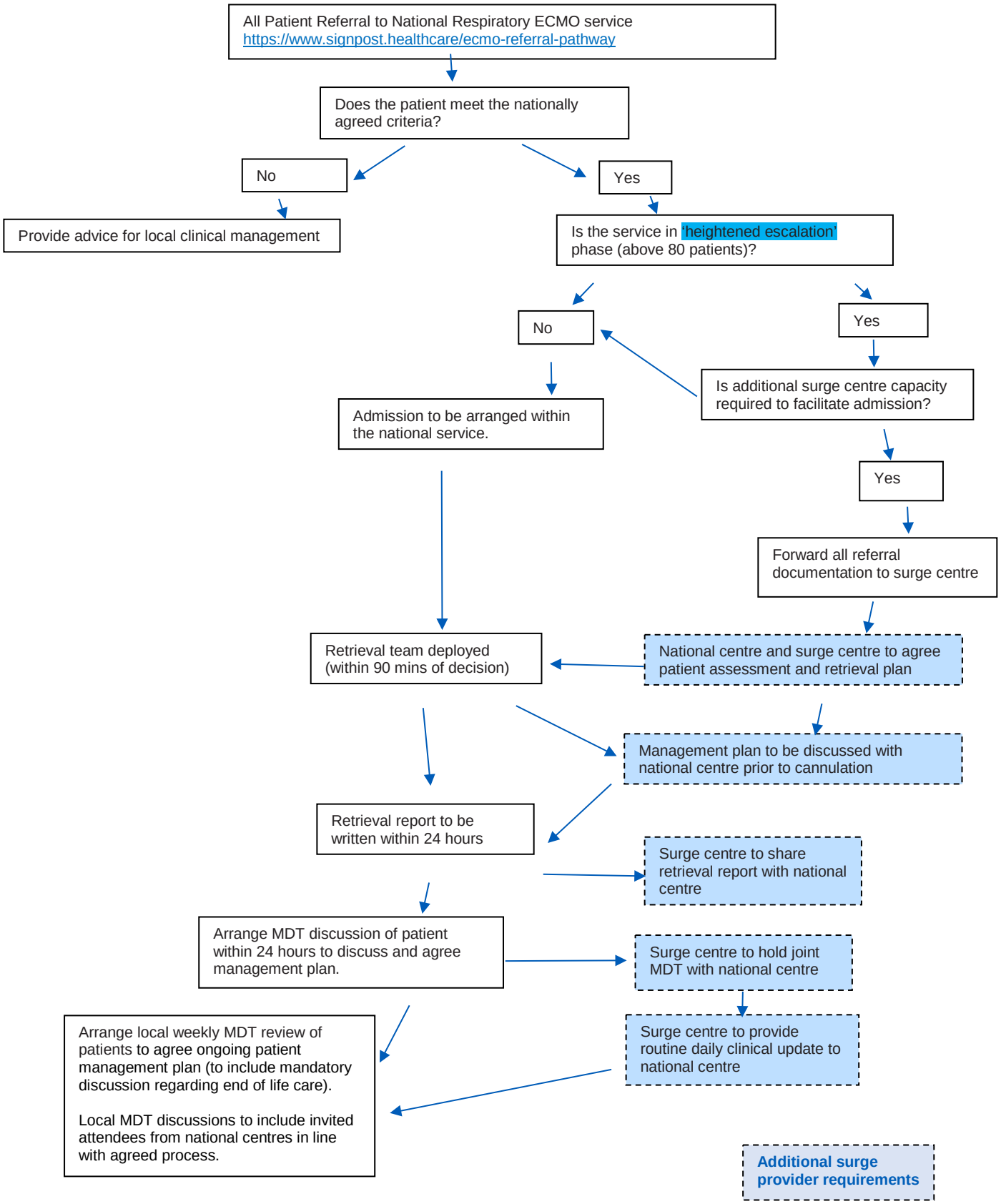
- Surge centres must have been subject to review by the Quality Surveillance Team at NHS England, to assess competence and compliance against agreed key quality indicators within the service specification.
- Surge centres must agree to adhere to the quality indicators and referral pathway set out.
- Surge centres will operate under the mentorship of an identified national centre.
- Surge centres will ensure accurate and systematic data reporting of **all** respiratory ECMO activity to support service planning and national co-ordination of care for patients (where required).

**As outlined in section 4: Surge and escalation management arrangements:**

- Surge centres will be alerted when national demand moves in to the 'escalation' phase as described in this document (national service exceeds 50 respiratory ECMO beds occupied) to provide advance warning and enable early preparations to be made. Surge centres will be encouraged to join the regular monitoring calls.
- If demand continue to increase to the 'heightened escalation' phase described in this document (national service exceeds 80 respiratory ECMO beds occupied), then the surge centres may be asked to accept patients as part of the national response. Surge centres will be required to join the regular monitoring calls.
- Surge centres may be required to accept patients on behalf of any of the national centres under this arrangement depending upon national service demand.

**Communications**

- The lead centre will define and both parties must agree and document a clear structure for local communication and information sharing at the key decision points identified below.
- Both parties will share duty rotas; contact details and agree frequency and timing of regular joint discussions, which should be documented.
- If a surge centre has a patient(s) on ECMO, the mentor centre is required to attend associated MDT discussions and reviews; with other national centres invited to attend as part of agreed peer support and shared learning.
- If the service reaches 'escalation' phase, surge centres will be invited to join MDT discussions at other national centres as part of agreed peer support and shared learning.


All Patient Referral to National Respiratory ECMO service
https://www.signpost.healthcare/ecmo-referral-pathway
Does the patient meet the nationally agreed criteria?
No
Yes
Provide advice for local clinical management
Is the service in 'heightened escalation' phase (above 80 patients)?
No
Yes
Is additional surge centre capacity required to facilitate admission?
Yes
Admission to be arranged within the national service.
Forward all referral documentation to surge centre
Retrieval team deployed (within 90 mins of decision)
National centre and surge centre to agree patient assessment and retrieval plan
Management plan to be discussed with national centre prior to cannulation
Retrieval report to be written within 24 hours
Surge centre to share retrieval report with national centre
Arrange MDT discussion of patient within 24 hours to discuss and agree management plan.
Surge centre to hold joint MDT with national centre
Arrange local weekly MDT review of patients to agree ongoing patient management plan (to include mandatory discussion regarding end of life care).
Local MDT discussions to include invited attendees from national centres in line with agreed process.
Surge centre to provide routine daily clinical update to national centre
Additional surge provider requirements

# 5.3 Appendix 4: contact details

**Adult Respiratory ECMO Lead in-hours**

Nicola Symes
nicola.symes@nhs.net
Tel: As advised to ECMO Centres

Fiona Marley
fiona.marley@nhs.net
Tel: As advised to ECMO Centres

**Paediatric Respiratory ECMO Lead in-hours:**

Nicola Symes
nicola.symes@nhs.net
Tel: As advised to ECMO Centres

Fiona Marley
fiona.marley@nhs.net
Tel: As advised to ECMO Centres

**Adult (and Paediatric) Respiratory ECMO Lead out-of-hours**

NHS England EPRR Team
England.eprr@nhs.net
0844 822 2888 ask for 'NHS 05'

In the event that either of the two in-hours leads are unavailable (for example, because of annual leave), the role will usually be undertaken by the other in-hours lead. An out-of-office message will be left in response to e-mails and a voicemail message will be left in response to phone calls.

**Specialised Services COVID-19 Issue Notification**

In the event an issue has not been addressed via the routes noted above it can be raised through completion of an 'Issue Notification' following the link below.

Only include issues that should be raised with the national specialised commissioning team.

https://specialisedservices.formstack.com/workflows/covid19_issue_log