Extracorporeal Membrane Oxygenation (ECMO)

I. Policy

University Health Alliance (UHA) will reimburse for extracorporeal membrane oxygenation (ECMO) when it is determined to be medically necessary and when it meets the medical criteria guidelines (subject to limitations and exclusions) indicated below.

II. Criteria/Guidelines

A. ECMO is covered (subject to Limitations/Exclusions and Administrative Guidelines) for critically ill newborns (age 28 days or younger) with respiratory failure after conservative management (medication and mechanical ventilation) is found to be ineffective and all of the following clinical criteria are met:

1. The newborn's corrected gestational age is 34 weeks or more, and surgical cannulation is possible (corresponding to a birth weight of about 2,000 grams);
2. The newborn has reversible lung disease; and
3. The newborn has not been on mechanical ventilation for more than 14 days.

B. ECMO is covered (subject to Limitations and Administrative Guidelines) for adults and children with acute severe cardiac or pulmonary failure that is potentially reversible after conservative management (medication and mechanical ventilation) is found to be ineffective. Clinical situations that may prompt the initiation of ECMO include the following:

1. Hypoxemic respiratory failure with a ratio of arterial oxygen tension to fraction of inspired oxygen (PaO2/FiO2) of <100 mmHg despite optimization of the ventilator settings, including the tidal volume, positive end-expiratory pressure (PEEP), and inspiratory to expiratory (I:E) ratio;
2. For adults with Acute Respiratory Distress Syndrome (ARDS) in severe respiratory failure (PaO2/FiO2 <70);
3. Hypercapnic respiratory failure with an arterial pH less than 7.20;
4. Cardiac/circulatory failure/refractory cardiogenic shock;
5. Massive Pulmonary Embolism;
6. Failure to wean from cardiopulmonary bypass after cardiac surgery; or
7. As a bridge to either cardiac transplantation or placement of a ventricular assist device (VAD).

C. The underlying disease is not the only consideration when evaluating the need for ECMO but also an assessment of:

1. Gas exchange in relation to current levels of mechanical ventilation;
2. The rate of deterioration; and
3. The success of other rescue therapies.

D. Specific cut-offs at which ECMO should be offered or withheld have not been firmly established and therefore should be evaluated on a case-by-case basis.
NOTE:

This UHA payment policy is a guide to coverage, the need for prior authorization and other administrative directives. It is not meant to provide instruction in the practice of medicine and it should not deter a provider from expressing his/her judgment.

Even though this payment policy may indicate that a particular service or supply is considered covered, specific provider contract terms and/or members’ individual benefit plans may apply, and this policy is not a guarantee of payment. UHA reserves the right to apply this payment policy to all UHA companies and subsidiaries.

UHA understands that opinions about and approaches to clinical problems may vary. Questions concerning medical necessity (see Hawaii Revised Statutes §432E-1.4) are welcome. A provider may request that UHA reconsider the application of the medical necessity criteria in light of any supporting documentation.

III. Limitations/Exclusions

A. ECMO for children and adults is not known to be effective in improving health outcomes for all other indications (e.g., burn and smoke inhalation injury) because of insufficient evidence of its safety and effectiveness.

B. ECMO is not known to be effective in improving health outcomes in patients with any of the following absolute contraindications:
   1. Neonates with major intracranial hemorrhage (grade III and IV);
   2. Neonates with uncorrectable cardiac lesions;
   3. Neonates with lethal congenital anomalies;
   4. Evidence of severe irreversible brain damage;
   5. Irreversible respiratory or cardiac failure; or
   6. Any pre-existing condition which is incompatible with recovery (severe neurologic injury, end stage malignancy).

C. ECMO for patients with any of the following relative contraindications may be considered on a case by case basis:
   1. When anticoagulation is contraindicated (e.g., bleeding, recent surgery, recent intracranial injury).
   2. For patients with respiratory failure, if mechanically ventilated for longer than seven days.
   3. For patients with cardiac failure, when a VAD or transplantation is contraindicated (e.g., the patient has preexisting renal failure, preexisting hepatic failure, significant aortic valve insufficiency, or inadequate social support).
   4. Other characteristics that may exclude some patients from receiving ECMO include advanced age, morbid obesity, neurologic dysfunction, or poor preexisting functional status.

D. Standard durations with ECMO vary by condition. It is initiated with the expectation that cardiorespiratory function will improve sufficiently to allow discontinuation of ECMO within 14-21 days.

E. ECMO should be discontinued if there is no hope for healthy survival (severe brain damage, no heart or lung recovery, or no hope of organ replacement by VAD or transplant).

F. Patients undergoing ECMO treatment should be periodically reassessed for clinical improvement. ECMO should not be continued indefinitely and should be considered for discontinuation if the following criteria are met:
   1. The patient has neurologic devastation as defined by the following:
a. Consensus from two attending physicians that there is no likelihood of an outcome better than “persistent vegetative state;” AND
b. At least one of the attending physicians is an expert in neurologic disease and/or intensive care medicine; AND
c. Determination made following studies including CT, EEG, and exam.

2. Inability to provide aerobic metabolism, defined by the following:
   a. Refractory hypotension and/or hypoxemia; OR
   b. Evidence of profound tissue ischemia based on creatine phosphokinase (CPK) or lactate levels, lactate-to-pyruvate ratio, or near-infrared spectroscopy (NIRS)

3. Presumed end-stage cardiac or lung failure without “exit plan (i.e., declined for assist device and/or transplantation).

IV. Administrative Guidelines

A. Prior authorization is not required because ECMO is generally provided on an emergency basis. However, after the initiation of ECMO, a written and signed treatment plan must be made available to UHA upon request, which documents the following:
   1. Discussion with patient or patient’s representative of advance care planning;
   2. Explanation of ECMO’s use as a temporary measure for life-threatening conditions; and
   3. Estimated timetable for withdrawal of ECMO support, given scenarios of various clinical parameters (e.g., discontinuation of ECMO if no clinical improvement in identified time frame).

   Note: Use beyond 21 days must be justified on clinical grounds specific to the affected patient.

B. UHA reserves the right to perform retrospective review using the above or other generally accepted criteria to validate if services rendered met payment determination criteria and to ensure proper reimbursement is made.

C. ECMO services provided for more than 14 days or that have a contraindication listed in Limitations/Exclusions above will be reviewed by a Medical Director. Supporting documentation must be submitted with the claim for review.

D. This policy may apply to the following codes. Inclusion of a code in the table below does not guarantee that it will be reimbursed.

<table>
<thead>
<tr>
<th>CPT Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>33946</td>
<td>Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; initiation, veno-venous</td>
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<tr>
<td>33947</td>
<td>Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; initiation, veno-arterial</td>
</tr>
<tr>
<td>33948</td>
<td>Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; daily management, each day, veno-venous</td>
</tr>
<tr>
<td>33949</td>
<td>Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; daily management, each day, veno-arterial</td>
</tr>
<tr>
<td>33951</td>
<td>Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; insertion of peripheral (arterial and/or venous) cannula(e), percutaneous, birth through 5 years of age (includes fluoroscopic guidance, when performed)</td>
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<tr>
<td>33952</td>
<td>Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; insertion of peripheral (arterial and/or venous) cannula(e), percutaneous, 6 years and older (includes fluoroscopic guidance, when performed)</td>
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| 33953    | Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; insertion of peripheral (arterial and/or venous) cannula(e), open, birth through 5 years of
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<td>Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; reposition peripheral (arterial and/or venous) cannula(e), percutaneous, birth through 5 years of age (includes fluoroscopic guidance, when performed)</td>
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<tr>
<td>33987</td>
<td>Arterial exposure with creation of graft conduit (e.g., chimney graft) to facilitate arterial perfusion for ECMO/ECLS (List separately in addition to code for primary procedure)</td>
</tr>
<tr>
<td>33988</td>
<td>Insertion of left heart vent by thoracic incision (e.g., sternotomy, thoracotomy) for ECMO/ECLS</td>
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V. Policy History

- **Policy Number:** MPP-0006-120101
- **Current Effective Date:** 01/09/2019
- **Original Document Effective Date:** 01/01/2012
- **Previous Revision Dates:** 09/01/2016, 12/01/2017
- **PAC Approved:** 01/01/2012