

**Appendix E. University of Minnesota refractory VF/VT ECPR protocol**

MRC refractory VF/VT inclusion criteria (must have all)	Exclusion criteria for early mobilization (presence of 1 would exclude the patient)	Cardiac catheterization process, ECMO, and angiography/PCI protocol	Post-resuscitation protocol
<ul style="list-style-type: none"> <li>• Out-of-hospital cardiac arrest (OHCA) with presumed cardiac etiology cardiac arrest.</li> <li>• First presenting rhythm was shockable (VF or VT).</li> <li>• Age 18 to 75 years.</li> <li>• Received at least 3 EMS delivered direct current (DC) shocks without sustained ROSC.</li> <li>• Received amiodarone 300 mg.</li> <li>• Body could accommodate a Lund University Cardiac Arrest (LUCAS)</li> <li>• System LUCAS automated CPR device.</li> <li>• Transfer time from the scene to the cardiac catheterization laboratory (CCL) of &lt; 30 min.</li> </ul>	<ul style="list-style-type: none"> <li>• Return of spontaneous circulation (ROSC) before 3 shocks were delivered (transferred to nearest hospital).</li> <li>• Nursing home residents.</li> <li>• Do not resuscitate/do not intubate.</li> <li>• Known terminal illness.</li> <li>• Traumatic arrest.</li> <li>• Pulseless electrical activity and asystole.</li> <li>• Significant bleeding.</li> <li>• Manual CPR as the only option.</li> </ul>	<ul style="list-style-type: none"> <li>• Patients with on-going CPR (LUCAS + impedance threshold device [ITD]) with refractory VF/VT that met the inclusion criteria enter the CCL.</li> <li>• Arterial and venous access under ultrasound during CPR.</li> <li>• Collect arterial blood gas and serum lactate.</li> </ul> <p>Angiogram of the left and right iliac and femoral arteries.</p> <ul style="list-style-type: none"> <li>• Can a 17–19 Fr extracorporeal membrane oxygenation (ECMO) arterial cannula (~5.5–6.0 mm diameter) fit in the groin?</li> <li>• Was the patient placed on the CCL table within ~ 60 min after the 911 call?</li> </ul> <p>Determine the presence of the CCL resuscitation discontinuation criteria. Patients with one or more of the following criteria: Terminate resuscitation.</p> <ul style="list-style-type: none"> <li>• ETCO<sub>2</sub> at arrival &gt; 10 mm Hg</li> <li>• PaO<sub>2</sub> &gt; 50 mmHg or O<sub>2</sub>Sat &gt; 85%</li> <li>• Serum lactate &lt; 18 mmol/L</li> </ul> <p>ROSC present: Coronary angiography (CAG) and percutaneous coronary intervention (PCI) as appropriate. No ROSC: initiate ECPR.</p> <ul style="list-style-type: none"> <li>• Place AV-ECMO with 25 Fr venous and 17–19 arterial cannulas and antegrade flow cannula.</li> </ul> <p>• Once hemodynamic/perfusion support is achieved, CAG is performed and revascularization accomplished as appropriate following ECLS.</p> <p>• When needed, additional hemodynamic support is achieved by placement of an intra-aortic balloon pump (IABP) or if PCI performed.</p> <p>Continue ACLS/ECLS for up to 90 min following CAG and PCI.</p> <ul style="list-style-type: none"> <li>• NO sustained organized electrical rhythm after 90 minutes: declare dead.</li> </ul> <p>• Sustained organized electrical rhythm with or without mechanical cardiac contraction: Admit to the Hospital (CICU).</p>	<ul style="list-style-type: none"> <li>• Patients received therapeutic hypothermia (TH) by standard protocol.</li> <li>• All patients received a baseline head computerized tomography (CT) radiograph.</li> <li>• Admission to the CICU under the care of interventional cardiology if return of cardiac function is achieved.</li> <li>• A multidisciplinary team of physicians and nurses provided continuous care to patients.</li> <li>• To achieve continuity of care, one attending (interventional cardiology) made all final decisions.</li> </ul>