

The Minnesota Resuscitation Consortium Systems-Based Approach to Out of Hospital Cardiac Arrest due to Refractory Ventricular Fibrillation. A one-year report.

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Background: In December of 2015, the Minnesota Resuscitation Consortium implemented a systems-based protocol of early mobilization to a tertiary academic hospital for patients presenting with out-of-hospital refractory shockable rhythms (VF/VT). We report the outcomes of 63 patients treated within the 1st year of the protocol.

Methods: Two major emergency medical services systems serving the Minneapolis-St. Paul metro area participated in the protocol. Inclusion criteria included age 18-75 years, body habitus accommodating automated LUCAS CPR, and estimated transfer time from the scene to the cardiac catheterization laboratory of ≤ 30 minutes. Exclusion criteria included known terminal illness, DNR/DNI status, traumatic arrest, and significant bleeding. Refractory VF/VT arrest was defined as failure to achieve sustained ROSC after treatment with 3 direct current (DC) shocks. Patients were transported to the University of Minnesota hospital where emergent advanced perfusion strategies (ECMO), followed by coronary angiography and PCI, were performed, when appropriate.

Results: Over the first 12 months of the protocol, 63 patients presented with refractory VF and were transported directly to the cardiac catheterization laboratory. Of these, 50 patients met the perfusion inclusion criteria upon arrival (lactic acid < 18 , ETCO₂ > 10 mmHg, SaO₂ $> 88\%$) and

resuscitation efforts were continued. ECMO was placed in 80%. 76% of patients had significant coronary artery disease and 67% received PCI. 82% of patients survived to hospital admission and 52% (26/50) survived to hospital discharge with 48% (24/50) achieving good neurologic function (CPC 1 and 2). Two patients developed significant lower extremity ischemia due to ECMO but had no chronic complications

Conclusions: A systems based approach for the management of OHCA refractory VF/VT protocol with early mobilization to an ECMO/PCI capable hospital is feasible in a large US metropolitan area and leads to a high functionally favorable survival rate with few complications.