IMPROVING ECMO OUTCOMES IN RESPIRATORY FAILURE PATIENTS

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**Introduction:** The mortality for Severe ARDS remains high, even in the modern era. Initial management includes treating treatable causes, low tidal volume ventilator strategy as described in ARDSnet, and consideration of more conventional advanced therapies such as prone positioning, inhaled Nitric Oxide and epoprostenol. ECMO is also considered in severe ARDS, however it needs to be considered early, and for those patients who are potentially recoverable.\(\text{(1)}\) In the CESAR trial, Peek and colleagues reported a substantial benefit to ECMO for the management of severe adult respiratory distress syndrome. As compared to the control group, the experimental group saw an improvement in survival without severe disability. The control group had a survival at 6 months of 47\%, whereas the experimental group had a 6 month survival of 63\%.\(\text{(2)}\) The number of VV ECMO patients has grown substantially. Over the past ten years, the number of ECMO centers has grown from 115 to 223, with the number of cases increasing from 1967 to 4357, according to the The Extracorporeal Life Support Organization (ELSO).\(\text{(3)}\) With the use of ECMO as part of the therapy in selected patients with influenza A (H1N1) in Australia and New Zealand, the growth of both ECMO programs and numbers of patients on ECMO has accelerated.\(\text{(4)}\) Our outcomes were not in line with National and International centers. We wanted to improve our processes, care pathways and ultimately to improve patient outcomes.

**Objectives:** Objective was to utilize Processes Mapping and PDSA as quality tools, to identify the strength and weakness of our ECMO program, to map a pathway for improvement. Based on these tools we developed a Multidisciplinary team, mutually agreed on protocol, addressed variations in care, reviewed outcomes and held each other accountable.

**Methods:** First step was identifying that we didn't have a process for ECMO placement in these patients and it was based on individual physician's discretion and decision making. It showed that variations in care was one of the primary weakness in our program. We developed a process map for these patients, developed an inclusion/exclusion criteria, treatment protocol, case reviews, etc. This was based on multiple PDSA cycles which we had to do with team member including, surgeons, Intensivists, Perfusionists, Nurses, Respiratory therapist, pulmonologists. In order to accommodate the increase case load we had to reinvent the care model from full time perfusionist at bedside to a Nurse ECMO specialist model with oversight from Perfusionist.

**Results:** From the 2011 and 2012 we were able to reduce mortality among respiratory cases of ECMO from 80\% to almost 23\% by September 2014. This translates to almost 75\% reduction in mortality among this high risk category. Also we were able to increase the volume of cases from 14 cases to 21 (and counting) cases leading to a 50\% increases in number of cases. This number which will increase more as the flu season hasn't started.

**Conclusion:** From the 2011 and 2012 we were able to reduce mortality among respiratory cases of ECMO from 80\% to almost 23\% by September 2014. This translates to almost 75\% reduction in mortality among this high risk category. Also we were able to increase the volume of cases
from 14 cases to 21 (and counting) cases leading to a 50% increase in number of cases. This number which will increase more as the flu season hasn’t started. Quality improvement tools have to go hand in hand with clinical tools in order to provide excellent care for patients.

**References:**