Doctor of Nursing Practice Project
Extracorporeal Membrane Oxygenation (ECMO): A Protocol Implementation for Quality Improvement

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Background

- ECMO use increased during COVID-19 to care for critically ill patients.
- ECMO use at project facility
  - 2019: 10 patients
  - 2021: 45 patients
- In 2020, mortality rates at the project facility were below the national average (Extracorporeal Life Support Organization, 2021).
- A lack of an ECMO protocol was identified.
- A well-formulated ICU protocol enhances clinical decision-making and demands constant attention to patient status details (Wall et al., 2001).
- Nursing care directly impacts improving the clinical condition of ECMO patients.
- Specific skills and standardized protocols are prioritized for nurses to effectively care for these complex patients (Conceição et al., 2019).

Purpose

- To implement a protocol for the ECMO population at a Midwestern level II trauma center.

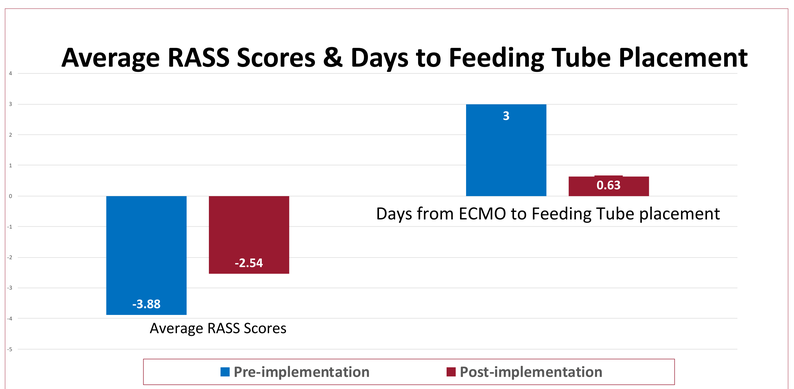
Method

- Developed and implemented an ECMO protocol that utilized EBP and Enhanced Recovery After Surgery (ERAS) elements.
- Provided educational sessions and materials to ECMO healthcare providers.
- Nurses completed a pre- and post-implementation survey.
- Analyzed pre- and post-protocol data for ECMO patients.
  - Survival rates
  - Richmond agitation and sedation score (RASS)
  - Nutrition
  - Mobility

Results

Nurse Survey

Questions 1= strongly disagree 5= strongly agree	Pre-implementation Mean and *SD* *n*=39	Post-implementation Mean and SD *n*=23	*p*-value and effect size
I know what ERAS entails	3.18 (1.30)	3.74 (1.10)	$p = .09$, $d = -.46$
Incorporating ERAS into the care of our ECMO patients is essential.	**3.81 (.97)**	**4.78 (.42)**	**$p < .001$, $d = -1.21$**
I feel confident implementing ERAS when caring for ECMO patients.	**3.18 (1.37)**	**3.91 (1.04)**	**$p = .03$, $d = -.58$**
Implementing ERAS when caring for our ECMO patients is beneficial to their outcomes.	**4.00 (1.04)**	**4.70 (.77)**	**$p = .01$, $d = -.74$**
Implementing ERAS into the care of ECMO patients is beneficial for nursing staff.	**3.82 (1.01)**	**4.52 (.67)**	**$p = .01$, d = -.79**
Implementing ERAS into the care of ECMO patients benefits our program and facility.	**4.00 (.96)**	**4.78 (.42)**	**$p < .001$, $d = -.98$**



Discussion

- Based on the nurse survey, knowledge levels improved post-implementation.
- ECMO nurses surveyed stated a better understanding and confidence in caring for ECMO patients post-protocol implementation.
- The EBP protocol implementation resulted in better patient outcomes
  - Improved sedations scores (RASS) (decreased from -3.88 to -2.54)
  - Improved nutritional status (ECMO initiation to feeding tube placement improved from 3 days to an average of 0.63 days)
  - Improved survival rates (increased from 40% to 60%)
- Limitations
  - Small sample size
  - Results dependent on accurate charting
  - Time constraints

Conclusion

- The complexity of ECMO patients and an increase in the use of ECMO demands consistency and continuity in care.
- A well-designed protocol effectively cares for the critically ill (Conceição et al., 2019; Wall et al., 2001).
- The project facility will continue to using the protocol.
- Recommendations
  - Larger sample size
  - Reliable metrics for mobility data,
  - Longer project timeline
  - Collect patient/hospital cost savings

References, ECMO protocol, & RASS scoring available upon request