Efficacy of a One-Day, Mannequin-Based Extracorporeal Membrane Oxygenation (ECMO) Training Course in Swine (*Sus scrofa*)

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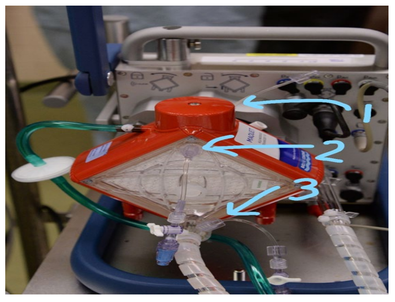
Background

- Extracorporeal membrane oxygenation (ECMO) is an advanced medical technology used to treat refractory respiratory failure, heart failure, or both.
- The coronavirus pandemic has resulted in a significant increase in patients treated with ECMO.
- The number of hospitals with ECMO capabilities and the number of ECMO trained physicians and nurses are limited.
- Further training of personnel in the initiation of ECMO therapy could expand this critical therapy.

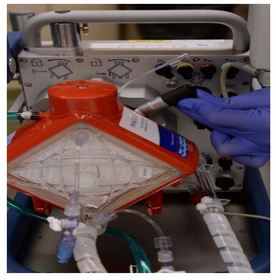
Objective

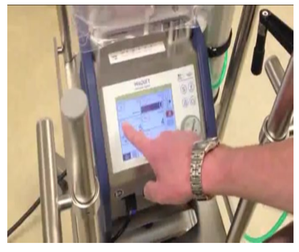
To evaluate the efficacy of our previously developed ECMO course using mannequin-based training in place of the currently existing live-tissue training model to determine if such a program was adequate and could be expanded to other facilities.



Methods

- Seventeen teams, each consisting of one physician and one nurse, were independently trained using prerecorded ECMO training lectures followed by hands-on practice of ECMO cannulation on two separate mannequin types.
- Each training session was approximately five hours in duration.
- The success of the training was evaluated via pre- and post-training knowledge and confidence assessments
- Research technicians observed and recorded each team independently attempting to initiate ECMO and trouble shoot common ECMO complications on a Yorkshire swine.





Results

- Seventeen teams completed the ECMO course.
- All teams were successful in priming and preparing the ECMO circuit.
- Sixteen of the 17 teams (94%, 95% CI = 71% - 100%) were able to successfully place the swine on veno-arterial ECMO. Of those 16 teams, 15 successfully transitioned to veno-arterial-venous ECMO.
- These results are similar to the success in our previous live-tissue training model.

Conclusion/Discussion

An abbreviated one-day lecture and hands-on, mannequin-based, ECMO course resulted in a high rate of successful skill demonstration and improvement in physicians' and nurses' knowledge assessments and confidence levels, similar to a previous live-tissue based training protocol.

Acknowledgements

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The views expressed are those of the authors and do not reflect the official views or policy of the Department of Defense or its Components. The experiments reported herein were conducted according to the principles set forth in the National Institute of Health Publication No. 80-23, Guide for the Care and Use of Laboratory Animals and the Animal Welfare Act of 1966, as amended. This study was conducted under a protocol reviewed and approved by the 59th MDW IRB in accordance with the approved protocol

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