

PS9.2

Innovative Nursing

13:15 Room 221

Use of a Locally Developed Novel Silicone Cannulation Model to Enhance Patient Safety in Extracorporeal Membrane Oxygenation*Lai PCK**Adult Intensive Care Unit, Queen Mary Hospital, Hong Kong***Introduction**

Extracorporeal Membrane Oxygenation (ECMO) is a high risk life-saving technology. Physicians must be competent in ultrasonography-guided ECMO cannulation but the required skill is more advanced than that for usual insertion of central venous catheter. Any procedural error may result in fatal complications.

Methodology

We designed a prototype model for ECMO cannulation training in 2015. The cannulation model was made of platinum-catalyzed silicones. In 2017, an ECMO cannulation simulation system was created to enhance the simulated blood vessel anatomy, venous compressibility and product durability.

Results

Our model is the first and the only cannulation model in the world designed particularly for training of ultrasonography-guided ECMO cannulation. The model had been on trial in physician training courses in Hong Kong, Qatar, Japan and Singapore in these two years. 78 clinicians were trained in the courses in Hong Kong. Mean product evaluation rating among clinicians was 4.53 ± 0.60 on a 5-point scale (high rate implied high realism). Mean perceived confidence score of participants before and after cannulation workshops were 4.3 ± 2.4 and 7.1 ± 2.1 on a 10-point scale ($p < 0.01$). Mean perceived competency score of participants before and after cannulation workshops were 4.6 ± 2.9 and 6.8 ± 2.3 on a 10-point scale ($p < 0.01$). For the intensive care units in Hong Kong which adopted its use in the training programme, major incident related to ECMO cannulation was reduced to zero. Based on unpublished ECMO data, we estimated that the relative risk reduction is 88.8% and the number needed to treat is 12.5 per year. The cost for each cannulation model was USD\$100 and it could withstand multiple punctures with large bore ECMO cannulas.

Conclusion

Ultrasonography-compatible silicone ECMO cannulation model can replace animal model for physician training, skill enhancement and competency assessment. It can simulate various body sites and incorporate into different ECMO cannulation situations according to training needs. This technology is replicable, cost-effective and can significantly enhance patient safety.