Strengthening Expertise Among Experts: A Cricothyrotomy Simulation

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Background

- Cricothyrotomy is an emergent, front of neck airway access performed in cannot intubate, cannot oxygenate (CICO) events
- CICO events account for up to 25% of anesthesia related deaths
- Incidence of cricothyrotomy is rare, making it a high risk, low frequency event, and clinicians have little opportunity to practice the skill
- Anesthesia providers report a lack of confidence in their ability to perform a cricothyrotomy
- A survey of 971 anesthesiologists found that only about 57% of respondents feel confident in having to perform a cricothyrotomy
- Of cricothyrotomies attempted by anesthesia providers, 65% of them fail
- Lack of confidence among anesthesia providers leads to poor outcomes related to CICO events
- **PICO Question:** Among anesthesia providers, does the implementation of a cricothyrotomy simulation improve self-perceived confidence in performing emergent cricothyrotomy?

Objectives

- Anesthesia provider self-perceived confidence in performing emergent cricothyrotomy will be improved after participation in a realistic cricothyrotomy simulation
- Anesthesia provider self-perceived confidence to recreate a realistic and cost-effective cricothyrotomy simulation will be improved following a video demonstration on model assembly

Methodology

Literature search was conducted on PubMED, Google Scholar, and CINAHL databases with findings limited to the past 10 years:

- Key terms: cricothyrotomy, simulation, self-efficacy, confidence, and anesthesia
- Yielded 531 results from all databases and a total of 6 publications were chosen to answer the PICO question

Recommendations for Practice

Anesthesia providers need opportunities to practice the skill of cricothyrotomy

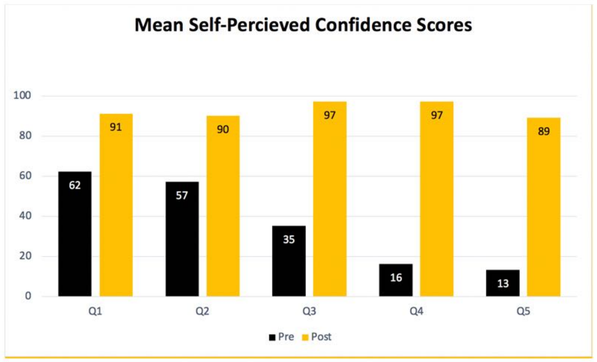
Simulation is effective in improving self-perceived confidence in performing cricothyrotomy

A realistic, cost-effective cricothyrotomy model can be assembled using porcine tissue to replicate human anatomy for cricothyrotomy simulation

The scalpel-finger-bougie method of cricothyrotomy is recommended as the most simple, rapid technique, requiring minimal equipment that is available in most settings where anesthesia is delivered

Translation

- A realistic, cost-effective cricothyrotomy simulation course was developed utilizing the Real Cric Trainer, a cricothyrotomy simulation model that incorporates the use of porcine tissue, a 3D-printed trachea, "bleeding," and a flash of air once the cricothyroid membrane is punctured
- A total of 11 CRNAs attended the cricothyrotomy simulation hosted at Cedar Crest College, School of Nursing
- Participants completed the pre-simulation and post-simulation surveys electronically via QR code to assess their self-perceived confidence levels regarding cricothyrotomy and ability to assemble a cricothyrotomy simulation model
- Data was analyzed using a paired *t*-test by SPSS to compare pre- and post-simulation self-confidence scores
- Data analysis revealed a significant increase in anesthesia provider self-confidence levels in their ability to perform an emergent cricothyrotomy following simulation



Key:

- Q1 - Use of the ASA difficult airway algorithm
- Q2 - Ability to identify the cricothyroid membrane
- Q3 - Ability to identify cricothyrotomy supplies
- Q4 - Ability to perform a cricothyrotomy
- Q5 - Ability to assemble a cricothyrotomy simulation model

Conclusion

- Cricothyrotomy is an essential, life-saving airway skill that anesthesia providers must be confident in performing during a CICO event
- The infrequency of cricothyrotomy prevents anesthesia providers from becoming proficient
- Simulation is an effective way of increasing anesthesia provider confidence with cricothyrotomy by providing an opportunity for practicing this skill
- Use of a cost-effective porcine tissue model provides a realistic simulation experience
- Simulation should be utilized for practicing high-risk low frequency scenarios

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