Anesthesia Machine Fundamentals: Improving Clinical Performance Through Adjunct Video Review

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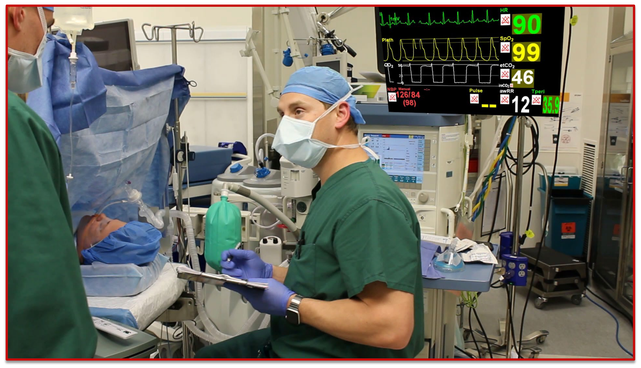
Introduction

- Resident Registered Nurse Anesthetists (RRNAs) must be armed with a strong foundational understanding of the anesthesia machine to confidently provide safe patient care.
- Novice RRNAs lack the experience & hands-on training required to confidently execute a basic anesthesia machine checkout & troubleshoot faults. Senior RRNAs stand to improve their knowledge retention & troubleshooting skills.
- **Implementation of a video learning adjunct applying the fundamentals of anesthesia machine to clinical practice may lead to improved confidence & clinical performance of RRNAs**.



Background & Significance

- Inadequate anesthesia machine checkout, *human error*, & unfamiliarity with anesthesia equipment have been attributed to *preventable critical anesthesia incidents.*
- Utilization of social media such as YouTube has been identified as a potential learning tool to stimulate & motivate the millennial learner.
- Combining a video-based educational tool with traditional classroom learning can effectively enhance acquisition of new skills, reduce time to complete tasks, increase confidence, & improve clinical performance.

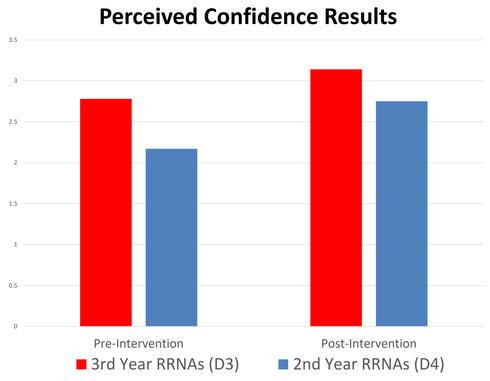
https://www.youtube.com/channel/UCJ1Z1341am3FKdtgdQ-w5ag

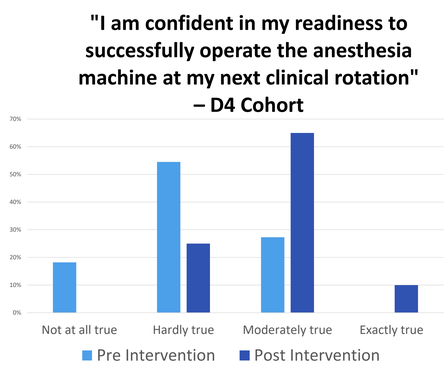
- YouTube channel, created by Rutgers Nurse Anesthesia Program (RNAP) graduates, provides template to create evidence-based videos & offers a platform to reach RRNAs across the globe.

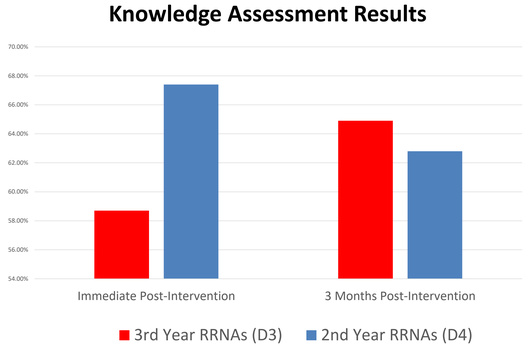
Methodology

- **Research Design**: IRB-approved, multicohort, descriptive, prospective study.
- **Study Population**: 3rd Year (D3) & 2nd Year (D4) RNAP students (N=43).
- **Study Intervention**: RRNAs participated in group viewing sessions of five short videos created by the authors. Videos focused on the subject of anesthesia machine fundamentals, checkout procedure, & trouble shooting, with attention to four commonly encountered anesthesia machines. Videos were uploaded to the Total Recall YouTube channel.
- **Outcomes Measured:** pre- & post-intervention perceived confidence surveyed using Likert-scale ratings, adapted from the general self-efficacy scale; knowledge & knowledge retention assessed using a multiple choice quiz given immediately post-intervention & repeated 3 months post-intervention.
- **Data Collection & Analysis:** descriptive statistics (mean, median, mode) to evaluate central tendency; Wilcoxon-Mann-Whitney tests & Wilcoxon signed-rank tests to compare results between cohorts completed utilizing Qualtrics online software and SPSS.

Results







Discussion & Limitations

- 91% of participants reported they would refer to these anesthesia video reviews in the future.
- Confidence improved for all participants 2.45 pre, 2.93 post ($p<0.05$); greatest increase in overall junior RRNA responses post-intervention.
- Positive feedback received from clinical preceptors regarding junior RRNA comfort/competence operating anesthesia machine.
- Many external factors may have influenced knowledge assessment scores: concurrent didactic learning, habits formed during clinical training, preparation for standardized exams, inexperience of question-writers.
- Limitations include small sample size in a single urban nurse anesthesia program.

Implications

- Opportunity to address area of weakness in RRNA knowledge translation & retention: anesthesia machine refresher to be added to senior RRNA curriculum.
- Videos posted on free, open access site allow access and utilization by other nurse anesthesia programs.
- Videos may be used to assist organizations in creating continuing education programs focusing on Equipment and Technology for NBCRNA Core Module requirements.

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