INTRODUCTION
Mentorship is an important tool for professional progression and academic growth. However, the role of mentorship in anesthesia is poorly understood. This study explores the prevalence of resident mentorship nationally and resident perceptions regarding the benefits and barriers to mentorship.

METHODS
A national survey was conducted that included all of the program directors and anesthesia residents in the 17 Departments of Anesthesia in Canada between July, 2014 and June 2015. Research ethics approval for this study was obtained prior to commencing.

RESULTS
The prevalence of mentorship programs nationally was 73%. Only 63.3% of residents surveyed had a mentor. However, 91.1% of residents agreed that mentorship would be beneficial to their overall success as an anesthesiologist. Female residents had a more positive attitude than males towards mentorship in terms of benefitting their overall success as an anesthesiologist (p=0.02). Overall, residents felt mentorship relationships were beneficial for career development, academic productivity, personal goal achievement, development of clinical and teaching skills, and building confidence. Commonly cited barriers included lack of time amongst mentors, lack of formalized meeting times and objectives, lack of connection, and lack of mentors with similar personal and professional goals.

DISCUSSION
Overall, the results from this study highlight the mismatch between residents’ perceptions of the importance of formal mentorship programs in anesthesia and their actual prevalence. More needs to be done in Canadian anesthesia residency training programs to address this gap. Mentorship programs may benefit from clear objectives, specified meetings times and residents’ input with their mentor selection.

References:
N/A
BACKGROUND
Crises in the operating room (OR) during a pediatric case are fortunately rare with the incidence of cardiac arrest in non-cardiac patients being 2.7/10000\(^1\). This rarity means that increasingly few anesthesiologists can claim personal experience of the full range of potential OR emergencies. In order to address this, the Society for Pediatric Anesthesia developed cognitive aids in the form of Critical Event Checklists (SPA CECs). Several studies have demonstrated the benefit of cognitive aids in improving adherence to guidelines, performing critical tasks and improved Anesthesia Non-Technical Skills\(^2,3\). However, despite the presence of cognitive aids, individuals often do not use the aids frequently or use them incorrectly\(^4,5\). The way that trainees utilize cognitive aids can potentially be augmented through improved education/orientation surrounding the tool. The objective of the study was to investigate whether the presence of SPA CECs improved the performance of anesthesiology trainees during simulations and whether the mode of orientation (e-module vs. didactic) resulted in improved uptake of the cognitive aids.

METHODS
REB approval was attained from the local institution. A randomized, 2 x 2 factorial design was used. Subjects were randomized twice. The first randomization was whether the SPA CEC was available to the participant during the simulations. The second randomization was the mode of orientation (e-module vs. didactic). The simulations were videotaped and will be rated by two Pediatric Anesthesiologists using the Managing Emergencies in Pediatric Anesthesia (MEPA) scenario specific checklist and GRS.

RESULTS
In this work in progress, we have conducted 36 simulations. Preliminary results demonstrate that in 28% of simulated scenarios, residents used a cognitive aid when it is available to them. Of the seven MEPA scenarios that residents were exposed to, cognitive aids were utilized exclusively on two scenarios (Malignant Hyperthermia and Local Anesthetic Toxicity). The uptake rate of cognitive aids in these two scenarios was 62.5% amongst residents that had cognitive aids available. Additional results, specifically performance impact of the CECs, will be available for presentation at the time of the conference.
DISCUSSION
Preliminary results suggest that uptake of the cognitive aid is dependent on the type of critical event occurring as opposed to the orientation that residents receive. Specifically, participants are more likely to use the SPA CEC in events that are task list oriented (i.e. Malignant Hyperthermia and Local Anesthetic Toxicity). The significance of these results is that they indicate that cognitive aids should be created for specific critical events; therefore, this lends insight into ways to improve currently existing resources (i.e. SPA CEC) and direction towards creation of future resources.

References:

INTRODUCTION
Healthy habits have been linked with enhanced learning during medical school, motivating some medical schools to institute healthy self-care programs for students. Previous research has studied the health habits of medical students, but none specifically during operating room (OR) rotations, which can be challenging in many ways. Also, none of the previous studies have determined if medical students are meeting recommended healthy living guidelines. This study measured the health habits of medical clerks during OR rotations and compared the results with recommended health guidelines.

METHODS
We created a survey examining markers of a healthy lifestyle, including getting adequate amounts of exercise and sleep, and abstaining from excessive consumption of junk food, caffeine, and alcohol. The healthy levels for each habit were determined from scientific guidelines for healthy living (e.g., Canadian Society for Exercise Physiology). The survey received REB approval. We distributed this survey to a sample of medical clerks in Canada and the USA. A respondent was considered to meet the guideline if they performed the positive behavior (or conversely abstained from the negative behavior) on a frequent basis.

RESULTS
A total of 543 medical students completed the survey. The proportion of respondents meeting recommended guidelines for each health habit are shown in Figure 1. 4.1% of students concurrently met all health guidelines and 4.8% concurrently met none. 45% of medical students met a majority of the health guidelines.

DISCUSSION
It is concerning that medical students report a severe lack of exercise; a lack of exercise has been associated with difficulty learning and ‘burnout’. This study was not designed to determine the causes of unhealthy habits, e.g., whether they stem from a lack of time, energy, motivation, or knowledge. This research supports the need for healthy self-care programs for medical students.
References:

152880 - ANESTHESIA CAREER EXPLORATION: A STRUCTURED OBSERVERSHIP PROGRAM

Author(s)
Isabella Devito
University of Toronto
Presenting Author

Co-Authors(s)
Ehtsham Baig - University of Toronto
Clyde Matava - Hospital for Sick Children, University of Toronto

INTRODUCTION
Medical student’s exposure to anesthesia is very limited in the pre-clerkship years, and often their only exposure is during their clerkship rotations. This is often late for decisions regarding residency programs. A study of final year medical students found that 50% of students who had not ranked anesthesia in the top three would have considered doing so had they completed their anesthesia rotation prior to deciding on a career pathway. (1) As a remedy to this problem, we developed a learner initiated and led structured anesthesia pre-clerkship observership program.

METHODS
The Anesthesia Career Exploration (ACE) pilot program was approved by our undergraduate education program. Students in their second year of medical school were invited to apply to the ACE program. This was held at the end of second year over a one week period. Each morning students would rotate through hospitals with focused areas of expertise. In the afternoon, tutorials led by residents and fellows, were held focusing on topics relating to an introduction to anesthesia, obstetrical anesthesia, pediatric anesthesia, regional/pain management and trauma/resuscitation. This was followed by workshops where students had the opportunity to learn clinical and procedural skills through participation in simulation using part task trainers and high fidelity simulation. The week ended with gamification to challenge students on their new clinical and technical skills. Students completed a pre and post survey assessing motivation, attitudes and impact of the ACE program.

RESULTS
Eighty percent of students enrolled had prior exposure to anesthesia through observerships or faculty mentors. The two highest rated external motivators for participation in ACE were “I was really inspired by an anesthesiologist” and “Someone has suggested to me that I should consider a career in Anesthesia”. The most popular internal motivator was “Anesthesia is challenging”. The ACE program was highly evaluated with a mean score of 4.67/5. The clinical exposure was the most popular aspect of the program. Students remained highly motivated to explore anesthesia as a career option. Knowledge regarding work/life balance, academic career, scope of clinical work and patient contact increased (see table). Student comments included “This was a fantastic program and I will definitely be recommending it to the first years.”
DISCUSSION
While in this initial pilot project, many of the students did have very limited, but prior exposure to anesthesia, as the number of students participating and the competition for available spots increases in this program, this could potentially expose more students to anesthesia with improved impact on career choice and education on the Anesthesiologists role in patient care. This was also an ideal format for increasing the role of resident involvement in formal teaching of medical students.

References:
INTRODUCTION
The goal of pre-clerkship is to teach general medical competencies, using teachers from a range of specialties [1-3]. Both anesthesiologists and students benefit from anesthesiology’s involvement in pre-clerkship. Students benefit from the unique expertise of anesthesiologists, while anesthesiologists benefit by meeting their academic deliverables, increasing the standing of their profession, and improving faculty career satisfaction. Previously, Canadian anesthesiology departments have played a variable role in pre-clerkship [4]. However, the perceived adequacy of anesthesiology’s contribution may vary between the anesthesiology department and the undergraduate medical education (UGME) office. This study describes the involvement of Canadian anesthesiology departments in pre-clerkship for the 2014-2015 academic year. It also examines the perception of three leadership groups i.e. Anesthesiology Department Heads, Anesthesiology UGME Directors, and Associate Deans of UGME, regarding anesthesiology’s contribution.

METHODS
We acquired a local REB approval and developed three surveys based on a previous survey [4]. We then conducted preliminary testing of the survey validity using computational linguistics analysis and cognitive interviews. In July 2015, we sent the surveys to the three aforementioned leadership groups at the 17 Canadian medical schools. Questions extracted the information uniquely available to each party. Instruction outcomes included the proportion of anesthesiologists taking on teaching responsibilities. Additional questions assessed perceptions regarding the adequacy of anesthesiology’s contribution, the ability of anesthesiologists to contribute, the duty of
anesthesiologists to contribute, and the indispensability of anesthesiology’s contribution. We compared the perceptions of the three leadership groups.

RESULTS
At the time of this preliminary analysis, all 17 Department Heads and 17 Anesthesiology UGME Directors had responded; 10 of Associate Deans had completed the survey. On a national level, only 12.9% of anesthesiologists had a teaching role in pre-clerkship; participation at individual institutions ranged from 1.1-46.1% of anesthesiologists. The accompanying figure compares the perceptions of the three leadership groups.

DISCUSSION
A minority of academic anesthesiologists in Canada contribute to pre-clerkship education; only 1 in 8 currently teach in pre-clerkship! Not unexpectedly, all the leadership groups think that the current contribution is inadequate. The three leadership groups differ regarding the profession’s contribution; compared to UGME Directors and Department Heads, UGME Associate Deans believe more strongly that anesthesiologists have a duty to contribute, but of some concern, they see this contribution as not being indispensable. In summary, anesthesiologists have an opportunity, and likely an unfilled obligation, to teach in pre-clerkship. Increasing the profession’s contribution would benefit students, and increase the profile of the specialty.

References:
BACKGROUND
According to the Royal College of Physicians and Surgeons of Canada’s CanMEDS 2015 Physician Competency Framework, as Scholars, “physicians demonstrate a lifelong commitment to excellence in practice through continuous learning and by teaching others, evaluating evidence, and contributing to scholarship” (1). Key concepts in training needed to support this commitment include practices of: Lifelong learning, teaching, evidence-informed decision making, and research. Our department has recently updated our curriculum to align with the new CanMEDS framework. Here we describe the development of a ‘Scholar in Anesthesiology’ curriculum to support the pedagogical needs of anesthesiology residents in their pursuit of the Scholar competencies required by CanMEDS 2015.

METHODS
Following publication of CanMEDS 2015, experts in education, research, and clinical practice followed an iterative process to identify methods and metrics to teach and assess competence in the role of Scholar in anesthesiology. The expert panel evaluated longitudinal and episodic curriculum elements that could be appropriately matched to the key competencies outlined in CanMEDS 2015. Chosen curriculum elements were then developed for educational implementation, supported by curated resources and mentorship structures. Specific deliverables were mapped to the overall competency-based residency program curriculum.

RESULTS
Longitudinal curriculum elements were identified and developed to address the key concepts of Evidence-informed decision making and Research. To develop and assess competence in evidence-informed decision making, residents will develop a structured research query to address a clinical topic, search the medical literature to identify a relevant article, and critically appraise this article to address their question. Prior to graduation, residents will address a broader topic and appraise and grade multiple sources of evidence to address this clinical issue. To develop competency in research
skills, residents will complete a project to generate new health-related knowledge and submit for peer-review. There will be structured assessments at established time points.

Residents will complete written reflections to support their development as lifelong learners and teachers, as well as to develop skills in evidence-informed decision-making. For example, residents will reflect on personal learning plans and/or methods for monitoring practice (lifelong learning); case preparation and sources of evidence drawn on to prepare for rare or complex cases (evidence-informed decision-making); and incorporation of medical evidence into teaching roles (teacher).

Development of competency in the Scholar role is further supported by an ‘Evidence Based Medicine’ seminar in Year 1, a ‘Residents as Teachers’ workshop delivered by the Postgraduate Medical Education office at the University, and completion of the TCPS-2 Ethical Conduct for Research module.

DISCUSSION
To our knowledge, this is the first ‘Scholar in Anesthesiology’ curriculum designed specifically for CanMEDS 2015. Implementation and evaluation of this curriculum is ongoing and will be reported in the future.

References:

(1) Frank et al. RCPSC 2015
CADAVER LAB BOOSTS RESIDENT CONFIDENCE IN INVASIVE AIRWAY MANAGEMENT

Author(s)
Miguel K. Fernandez
The University of British Columbia
Presenting Author
Co-Author(s)
Steven Green - The University of British Columbia
Henrik Huttunen - Vancouver General Hospital

INTRODUCTION
Airway patency is required to maintain ventilation and oxygenation under general anesthesia. The “can’t intubate, can’t ventilate” (CICV) scenario is a life-threatening emergency, occurring in less than approximately 0.01-2 per 10,000 elective cases.1 Without rapid expert management, this situation can rapidly lead to brain injury, cardiopulmonary arrest, and death of the patient.2 The American Society of Anesthesiologists’s Difficult Airway Algorithm ends with “emergency invasive airway access,” defined as “surgical or percutaneous airway, jet ventilation, and retrograde intubation.” Given the low incidence of CICV cases, most anesthesiology residents graduate without this important clinical experience.

In 2011, the Royal College of Anesthetists recommended that the technique of cannula cricothyroidotomy be taught to the highest standards, and that anesthetists should be trained to perform a surgical airway.3 "Local University" Uhosts an annual workshop where anesthesiology residents practice surgical and percutaneous airway skills on deceased porcine tracheas. In an effort to improve anatomical fidelity and practice procedural skills, senior anesthesiology residents recently participated in an invasive airway workshop utilizing fresh-frozen human cadavers. Since this was the first such workshop at "Local University", we aimed to determine if the experience made a difference for the positive.

METHODS
Ethics: Approval was obtained from the local Behavioural Research Ethics Board.
Study Design: Prospective pre- and post-educational.
Inclusion Criteria: PGY-4 anesthesiology residents in the 5th month of the academic year.

Exclusion Criteria: Formal invasive airway training prior to anesthesiology residency. (Not found to be applicable to any of the participants.)
Number of participants: 8 (limited by cadaver availability).
Surveys: Documented previous invasive airway training and/or experience, and used a unipolar horizontal visual analogue scale (VAS) to measure resident confidence, before and after the workshop, in the following four areas:

i. Management of a CICV scenario.
ii. Use of a cricothyroidotomy kit.
iii. Performing surgical cricothyroidotomy independently.
iv. Performing Seldinger cricothyroidotomy independently.

Interventions:
1. Didactic lecture reviewing the following:
   i. ASA difficult airway algorithm.
   ii. Anatomy and surface landmarks of the adult airway.
   iii. Invasive airway equipment
   iv. Step-by-step video demonstration of surgical &
   Seldinger cricothyroidotomy techniques.
2. Wet-lab utilizing fresh-frozen human cadavers and the Cook Medical Melker
   Universal Emergency Cricothyrotomy Catheter Set, allowing residents to practice the
   following emergency airway procedures:
   i. Surgical cricothyroidotomy.
   ii. Seldinger technique (wire-guided) cricothyroidotomy.

RESULTS
Please note that this online interface is not allowing me to insert my data set.
In brief, all residents showed an improvement in confidence in all categories
(management of a CICV scenario, use of a cricothyroidotomy kit, performing surgical
Cricothyroidotomy independently, and performing Seldinger cricothyroidotomy
independently.) In relative terms, the residents were 2.8, 1.9, 7.5, and 2.5 times more
confident in the previously mentioned categories, respectively.

DISCUSSION
All subjects demonstrated an increase in confidence across all categories. We believe
the hands-on cadaver lab played the greatest role in increasing resident confidence;
however, we cannot ignore the potential contributions of the didactic lecture and airway
videos. Also, the pre- and post-intervention survey were conducted on the same day, so
we do not know if the observed increase in confidence is permanent or if it declines with
time. Subsequent study design might consider surveying participants three, six, and
twelve months after the intervention.

References:
1. Heard a. MB, Green RJ, Eakins P. The formulation and introduction of a “can’t
   intubate, can’t ventilate’ algorithm into clinical practice. Anaesthesia. 2009;64(6):601-

2. Apfelbaum JL, Hagberg C a., Caplan R a., et al. Practice guidelines for management
   of the difficult airway: an updated report by the American Society of Anesthesiologists
   Task Force on Management of the Difficult Airway. Anesthesiology. 2013;118(2):251-
   270. doi:10.1097/ALN.0b013e31827773b2.

3. Katz J a. 4th National Audit Project of the Royal College of Anaesthetists and The

A SCOPING REVIEW OF PODCASTS IN E-LEARNING: DETERMINANTS OF SUCCESS

Author(s)
Fahad Alam
Sunnybrook health Sciences/University of Toronto

Presenting Author

Co-Author(s)
Devin Singh - Queens University
Clyde Matava - The Hospital for Sick Children

BACKGROUND & INTRODUCTION
Podcasting has become popular in medication largely for the advantages such as easy to create, cheap costs for distribution and ease of portability. However, there is no data describing factors associated with success or quality of podcasts. The goal of our study was to identify successful podcasts in anesthesia and identify factors associated with success.

METHODS
Independent reviewers performed a systematic search of anaesthesia related podcasts on iTunes Canada. Data and metrics recorded for each podcast included: podcast’s authorship, number posted, podcast duration target audience, format, and social media presence. Descriptive statistics and ANOVA were used to analyze data.

SUMMARY OF RESULTS
21 podcasts related to anesthesia were included in the final analysis. Only a third were still active. The median longevity of the podcasts series was only 15 months (IQR: 3-28 months). Less than 10% of podcasts had user ratings. Factors associated with success were: podcasts created by professional associations and industry; content that included clinical topics and procedural topics of posting (P

DISCUSSION AND CONCLUSIONS
We have developed a novel tool for assessing the success for a podcasts. The majority of anesthesia podcasts have a short half-life of only 15 months. Successful podcasts are associated with professional associations or industry. Inclusion of review process may help with increasing usage of podcasts. Reasons for this may be the need for fresh and quality content and good editing by users. The lack of these maybe associated with the early demise of a podcast series.

Take-home messages: Podcast creators and users should consider these factors associated with success when creating podcasts.
References:


153038 - OPEN-SOURCE SOFTWARE TO DEVELOP LOW-COST 3D MEDICAL PHANTOMS

Author(s)
Stephanie Zhou
Department of Anesthesia/University of Toronto
Presenting Author

Azad Mashari
Department of Anesthesia/University of Toronto
Primary Author

Co-Authors(s)
Eitan Aziza - Department of Anesthesia/University of Toronto
Massimiliano Meineri - UHN - Toronto general Hospital
Matt Ratto - University of Toronto/Faculty of Information
Josh Qua Hiansen - Toronto General Hospital/University of Toronto
Stephanie Zhou - University of Toronto
Eitan Aziza - University of Toronto
Matt Ratto - University of Toronto
Josh Qua Hiansen - university of Toronto
Azad Mashari - University of Toronto

INTRODUCTION
Studies have advocated for the extended use of medical simulators as an adjunct teaching methodology to increase the comfort and competency of medical practitioners in a variety of tasks\(^1\text{--}^2\). A variety of simulators, referred to as phantoms, are available as teaching tools. These phantoms range from home-brewed solutions to professional grade, expensive, mannequins. Increasingly, 3D printed patient-specific phantoms have been described\(^3\text{--}^6\), however, many of these were printed with industrial-grade printers and proprietary software suites\(^6\). The maturation of commercially-targeted 3D printers has significantly reduced the cost of 3D printing infrastructure while increasing printer capabilities and the range of usable materials. Additionally, the ever-growing library of free/libre open-source software (FLOSS) suites allows for streamlined medical image segmentation and low-cost 3D model augmentation. Presently, we demonstrate the efficacy of a FLOSS, low-cost 3D printer tool-chain to develop accurate, functional and extremely low-cost 3D printed patient-specific phantoms.

METHODS
After REB approval, anonymized patient CT DICOM data sets were downloaded from a free, online DICOM repository [www.osirix-viewer.com/datasets](http://www.osirix-viewer.com/datasets). For this experiment, two DICOM sets were chosen: one with adequate resolution of the patient’s spine and the other focused on the patient’s upper airway. DICOM data was viewed in free medical segmentation software ITK-SNAP; a semi-automated, region-growth selection module was used to generate a voxel model of the patient’s thoracic spine and upper airway. These voxel models were exported as a stereolithographic (.stl) file type and opened in free 3D modelling suite Meshmixer (Autodesk, Inc., San Rafael, CA, US).
Within Meshmixer, models were repaired and surface deformities were smoothed. Modified spine/airway models were prepared for 3D printing within the FLOSS program, Slic3r, as a 3D printer readable .gcode file. Models were then uploaded to commercial 3D printer Lulzbot Taz 5 (Aleph Objects Inc.) for fabrication. The produced spine model was tested via ultrasound to examine the model's imaging quality and the airway model was examined via bronchoscopy.

RESULTS
In total, thoracic spine and patient airway phantoms required approximately 17 and 7 hours respectively to print. The raw materials cost for the spine and airway phantoms were approximately $7.00 and $3.00 to produce. Imaging the spine with ultrasound resulted in slightly hyperechogenic surface quality; however, still represented anatomical features accurately. Furthermore, bronchoscopy revealed a realistic view of the internal geometries of the airway and very closely replicated the techniques necessary to manipulate a bronchoscope in vivo (table 1).

DISCUSSION
We have demonstrated the efficacy of FLOSS software and low-cost 3D printers to develop patient-specific thoracic spine and upper-airway medical phantoms. Relatively fast print-times extremely low production costs and demonstrated efficacy for medical training collectively provide impetus for further investigation into the development of more complex and accurate 3D printed phantoms.

References:


