Introduction: In an era of growing public demand for the provision of high quality care and accountability, guidelines for continuing medical education are under constant review. The primary objective of our systematic review was to determine whether simulation-based education (SBE), in isolation or combined with alternative educational strategies, is an effective learning strategy independent practitioners in anesthesiology relative to Kirkpatrick’s model of educational outcomes. Our secondary goal was to describe the current use of simulation-based performance assessment.

Methods: A systematic search of online databases (MEDLINE, EMBASE, PubMed, CENTRAL, and CDSR) was conducted to include studies published from 1948 (MEDLINE) until January 31st, 2013. All original research describing SBE for attending anesthesiologists was considered eligible for inclusion. Data analysis and extraction was carried out independently by two authors with further review by a third author in cases of disagreement until consensus was reached. For simulation-based performance assessment, tool characteristics and sources of validity evidence were collated.

Results: Of 1963 studies screened, 22 studies met inclusion criteria. Only 8 studies recruited independent practicing anesthesiologists as their sole target group highlighting that this population remains understudied. Fifteen studies described the effectiveness of SBE (see table 2). With the exception of studies employing survey-based methodology, the effectiveness of SBE was evaluated in the simulated setting in 8 instances. Over two thirds of studies identified reported a positive effect on learning. All surveys describing the learner’s reaction and self-perceived impact on subsequent clinical practice reported high satisfaction scores with associated improved preparedness and/or performance. Seven studies reported the psychometric properties of simulation-based performance assessment as their sole objective. These predominantly recruited Anesthesiologists as a convenience sample to establish discriminative validity and concentrated on a single aspect of validity evidence.

Conclusions: Anesthesiologists perceive simulation as a positive experience with self-reported impact on performance in a wide variety of clinical settings. Limited evidence suggests that SBE is associated with improved learning both immediately and in the longer-term when compared to no other intervention. Few studies compared participation in SBE with other educational strategies. This limits our ability to comment on the effectiveness of simulation when compared to alternative, non-simulation-based CME activities. Although simulation-based assessment appears to discriminate between experienced and inexperienced practitioners, none of the studies identified specifically examined different aspects of construct validity or performance standards for experienced practitioners. Future research in this area should focus on the optimal modality and frequency of exposure, quality of assessment tools and the impact of simulation-based educational interventions beyond the individual towards improved patient safety.
References:

Table 2: Characteristics of studies describing the outcomes of a simulation-based educational intervention

<table>
<thead>
<tr>
<th>Learning outcome by Kirkpatrick model</th>
<th>Number of studies (% of total)</th>
<th>Number of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1: Participation in an educational experience and the learner’s reaction</td>
<td>3 (20%)</td>
<td>54</td>
</tr>
<tr>
<td>Level 2a: A change in the learner's attitudes and perceptions</td>
<td>4 (27%)</td>
<td>378</td>
</tr>
<tr>
<td>Level 2b: A change in the learner's knowledge and/or skills</td>
<td>7 (47%)</td>
<td>281</td>
</tr>
<tr>
<td>Level 3: Behavioural change</td>
<td>None</td>
<td>0</td>
</tr>
<tr>
<td>Level 4a: Change in professional practice</td>
<td>None</td>
<td>0</td>
</tr>
<tr>
<td>Level 4b: Benefits to patients</td>
<td>1 (6%)</td>
<td>272</td>
</tr>
</tbody>
</table>
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Robert McGraw, M.D - Emergency Medicine, Queen's University

Introduction: Traditionally, technical skills proficiency was assessed by direct observation. While direct observation and feedback are essential components in technical skills learning they demand considerable investment of faculty time, and as an assessment tool direct observation is inherently subjective and has been criticized as unreliable (1). The purpose of this study was to determine if quantitative electromagnetic motion tracking is feasible, and could discriminated between experts and non-experts during simulated ultrasound guided insertion of a central venous catheter guidewire.

Methods: 10 resident physicians (FRCP PY1 and 2, CCFP-EM 1) and 10 staff (ICU fellows or attending physicians) were recruited. Electromagnetic sensor probes were used to capture hand motion during an ultrasound guided internal jugular cannulation on a standardized manikin. Hand, ultrasound and needle motion was analyzed for the following metrics: total path length, total time, translational movements and rotational movements. Subjects were also videotaped and evaluated using a global rating scale by a blinded expert.

Results: There was a significant difference in almost all examined motion parameters between experts and non-experts. Experts took 66% less time (50.2 vs. 148.7 sec, p<0.005), and had significantly less right hand and ultrasound motions (total path, translational and rotational movements). Left hand path distance was the only parameter that was not significantly different between groups (experts 2466.9 mm vs. non-experts 4120.8 p=0.08). Concurrent validity of motion parameters was established by strong correlations (r>0.74) to a previously published, modified global rating scale.

Discussion: We have demonstrated that electromagnetic hand and instrument motion analysis is technically feasible for assessing competence in the skills of ultrasound guided insertion of a central venous catheter guidewire in a simulated setting. In showing that is discriminates between the performances of non-experts and experts we have provided evidence for construct validity. It also shows excellent correlation with a modified version of a previously validated global rating scale; evidence of concurrent validity.

References:
38436 - PROFESSIONAL, HEALTH ADVOCATE AND SCHOLAR SIMULATION ASSESSMENT

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Background: In contrast to Medical Expert (ME) and other Intrinsic CanMEDS competencies, Professional, Health Advocate and Scholar (PHAS) have been difficult to define and assess during clinical practice and in simulations. (1) Our objective was to collect evidence to support construct validity of revised Generic Integrated Objective Structured Assessment Tool (GIOSAT) including content, response process, internal structure, relation to other variables and consequences using simulated scenarios targeting PHAS competencies.

Methods: Ethics Board approval and informed consent were obtained for a prospective single blind correlation study. Content: Two simulated scenarios were developed by a panel of experts highlighting PHAS competencies: Do-not resuscitate (DNR) and Morphine overdose (MOD) with disclosure.(2)(3) Response process: Four trained raters blinded from residents' level of training analyzed video recordings using the GIOSAT. Internal structure was analyzed with generalizability studies for ME and PHAS scores. Relation with other variables: Primary outcome: correlations between post-graduate year of residency (PGY) and average PHAS, Intrinsic, Medical Expert and Total scores. Secondary outcome: correlation between PHAS scores with other Intrinsic, ME and total GIOSAT scores excluding PHAS.

Results: Twenty one anesthesia residents participated in the study. Generalizability study: Participant (p) accounted for 20 % of variation component (VC). Scenario (s) and raters (r) did not account for important VC. However, the interaction between ps and psr accounted for 7 %VC and 17 %VC respectively. G-coefficient (overall reliability) was .66. Two raters and eleven scenarios using ME and PHAS are required to obtain a G-coefficient >.8. (Table 1) PGY correlated with PHAS (r=.59, p=.004), Intrinsic (r=.65, p=.002) and total scores (r=.46, p=.034) but not with ME (r=.26, p=.25). PHAS scores significantly correlated with other Intrinsic (r=.91, p<.000), ME (r=.7, p<.000) and Total excluding PHAS (r=.82, p<.0003).

Discussion: Our study demonstrated evidence of construct validity evidence for assessing PHAS and Intrinsic competencies using clinical simulation with a G-coefficient of .66. Previous studies have shown limited reliability for assessment of professionalism.(4,5) Results from this study are aligned with a systematic review focused on reliability of OSCEs, which found overall alpha coefficients of 0.62 and generalizability of 0.49. (6) Reliability increased with the number of stations and assessing less complex constructs such as medical history of physical examinations. More complex constructs such as PHAS competencies may need to accept lower reliability. The major limitation of this study is construct under-representation as we only had two scenarios. Although correlation between PHAS...
scores and PGY was positive, comparison with other scales (such as checklists) would be a good alternative to support relation with other variables. Future studies with similar methodology may support construct validity for PHAS competencies at high stakes level using two raters and eleven or more scenarios.

References:
2. Circulation [Internet]. 2010 ;122(Suppl 3):S665–75. A

<table>
<thead>
<tr>
<th>Scenario</th>
<th>rater</th>
<th>competency</th>
<th>G</th>
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<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0.31</td>
</tr>
<tr>
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<td>2</td>
<td>0.42</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>2</td>
<td>0.54</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>2</td>
<td>0.44</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0.57</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>2</td>
<td>0.69</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>2</td>
<td>0.60</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>2</td>
<td>0.72</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>2</td>
<td>0.82</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>2</td>
<td>0.68</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>2</td>
<td>0.79</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
<td>2</td>
<td>0.87</td>
</tr>
</tbody>
</table>

D-Study for two scenarios: Do not resuscitate and morphine overdose, two competencies: PHAS (Professional, Health Advocate and Scholar) and Medical Expert. Twenty one anesthesia residents. G= Generalizability coefficient.
Introduction: Physical exam skills are declining amongst trainees at all levels,\textsuperscript{1-4} a trend common in specialties with access to technologies like echocardiography.\textsuperscript{5} In anesthesiology, a patient’s perioperative management includes the cardiac exam, and in emergencies, a preoperative echocardiogram may not be available. Anesthesiologists have distinct considerations for differing valvular pathologies that influence patient outcomes. Therefore, ensuring that trainees acquire cardiac auscultation skills is paramount.

With decreasing work hours, simulation-based medical education is an alternative for learning cardiac auscultation. While many clinicians suggest that direct supervision is essential when teaching clinical skills, providing a clinician’s time is resource intensive. One way to decrease costs is via self-regulated learning (SRL).

Engaging in SRL, trainees may benefit from being able to develop and learn from their own learning approaches. Unlike those who learn with an instructor (have to reconcile the instructor’s teaching approaches with their own learning approaches), the individualized experiences of SRL trainees’ may lead to more robust learning outcomes.

Methods: After receiving local ethics approval, we computer randomized first and second year medical students (n=32) to 2 conditions: (i) SRL, and (ii) one-on-one instructor-regulated learning (IRL). All participants practiced diagnosing murmurs and underwent 3 video-recorded testing scenarios including immediate post-test, retention and transfer tests (both 2 weeks later). For all tests, we assessed participants’ diagnostic accuracy. We documented the students’ sequence of practicing murmurs as a proxy for understanding their learning approaches. We subsequently performed semi-structured interviews aimed at clarifying each participant’s learning approaches for learning murmurs and for general learning, and their awareness of strategies for regulating learning.

Results: There was no significant between-group difference in: (i) time for all 3 sessions, (ii) diagnostic accuracy on immediate posttest and retention tests ($F(1,18)=1.037$, $p=0.322$), and (iii) diagnostic accuracy on the transfer test ($p=0.628$). Chi-squared analysis suggests no differences between instructors’ and students’ approaches to organizing murmur sequences for practice ($p=0.074$). Emergent themes from our qualitative work suggest that students use self-testing, start with familiar concepts, build on prior knowledge, and use confidence as a proxy for learning. Students express their need to seek social acceptance and exposed to normative pressures.

Discussion: Contrary to clinicians’ expectations, the outcomes did not differ on any test. SRL training appears to be efficient in that it provides equivalent learning outcomes without the added resource-intensive support of a clinician. Our interview data suggest that students prefer building on previous knowledge and normative pressures deter them from asking questions. In an era of increased physician time demands and decreased trainee work hours, SRL may be a plausible way of teaching cardiac auscultation skills to trainees.

References:
3. Mangione SA, L.Z. Cardiac auscultatory skills of internal medicine and family practice trainees. 


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Introduction: Crisis situations in medicine are low frequency, high-stakes events where poor management can negatively impact patient outcome(1). Anesthesiology has a long history with crisis resource management (CRM) training, which has demonstrated benefits in clinical practice(2). Medical crises are often managed by multiple physicians, which may lead to unclear leadership, poor communication and lack of a shared mental model(3). This differs from traditional CRM training, where teams often have single physician leadership. The gap between traditional CRM training and the complexities of interspecialty care in crises (e.g. leadership negotiation, etc.) may be problematic. To address this gap we developed, implemented and evaluated a simulation-based interspecialty team CRM training program for senior residents. Here we report a) the details of the program, b) the current amount of CRM and interspecialty training participants receive, c) reported clinical experiences in interspecialty crisis situations, and d) perceived benefits of the program.

Method: This study was approved by the Ethics Board at our institution. Senior residents from anesthesia, otolaryngology (OTL) and pediatric emergency medicine (PEM) participated in a half-day simulation-based program focusing on interspecialty CRM challenges. An interspecialty team constructed all training materials to emphasize potential areas of conflict and miscommunication unique to interspecialty teams. Debriefings following scenarios focused on a) interspecialty-specific issues (e.g. transfer of leadership, clear intra- vs. inter-specialty communication), and b) development of a shared mental model, where residents explore other specialties’ management approach and are able to create a cohesive management strategy. Residents completed a pre-course survey reporting previous CRM experience (including interspecialty), self-reported clinical experiences in interspecialty crises, and perceived CRM skill level. In a post-course survey residents reported perceived CRM skill level (including those relevant to interspecialty context).

Results: 14 anesthesia residents participated, of which 100% reported receiving previous simulation-based CRM training (compared to 56% (10/18) PEM and OTL residents). Only 31% reported receiving prior interspecialty training (33% (6/18) OTL and PEM residents). 57% (8/14) of anesthesia residents reported prior clinical experience in interspecialty crisis contexts (e.g. difficult airway management in ICU); narrative comments of interspecialty-specific issues encountered frequently included unclear leadership and poor communication. Participants self-reported significant increases in CRM skills following course participation (pre= 3.6(.13), post=4.0(.16), on a 5-point scale)(F(1,143)=17.4,p<0.005).

Conclusion: Anesthesia residents receive CRM training, but little with an interspecialty focus. Residents report involvement in interspecialty crisis situations in clinical practice, suggesting a training-to-practice gap. Results support the program continuation, as residents report increases in CRM skills.

References:
Introduction: Ultrasound (US) imaging to assist in invasive procedures, such as lumbar puncture (LP), is increasingly being used to improve procedural success and reduce complications. This technique may be more useful when the patient has congenital or degenerative spine abnormalities, or when the bony landmarks are not palpable as in obese patients. The main disadvantage of the ultrasound-guided technique is the long learning curve often required to gain competence.\(^1\) A training platform for ultrasound guidance, named Perk Tutor, has recently been developed for use as a training aid for various needle insertion procedures\(^2\). This platform displays the US image overlaying a 3-dimensional (3-D) image derived from a computed tomography (CT) scan and showing real-time needle position during the procedure. It also gives feedback to the trainee by computing motion economy parameters and time spent in each workflow step. Indeed, it has been successful in teaching spinal facet joint injection to novices\(^3,4\). Perk Tutor is part of the free 3D Slicer software, and integrates with most available ultrasound machines and position trackers, allowing low-cost replication at clinical simulation centers. Phantom models are commercially available, and spine models can be customized with recent 3-D printing technology. We proposed that Perk Tutor would help learners gain skill in ultrasound image interpretation and needle coordination, thereby enhancing LP success in challenging cases.

Methods: After obtaining local research ethics board approval and voluntary informed consent, we recruited 20 anesthesia and surgery residents. They were randomly assigned to either the Perk Tutor (P) group or the Control (C) group and asked to perform an LP on a lumbar spine part-task trainer. The trainer was fitted with one of three different custom spine inserts of varying types of spinal pathology. Group P was trained on model one and two using the 3-D display along with conventional ultrasound imaging, while Group C had access to only conventional ultrasound imaging. The groups were then compared using model three and both groups were only allowed the conventional ultrasound during this phase of the study. We measured success rate, potential tissue damage (area that the needle swept inside the tissue model), needle path in tissue, and total procedure time.

Results: Nine out of 10 participants in Group C and all 10 participants in Group P were successful within the testing time of 10 minutes. Needle trajectory analysis revealed that potential tissue damage was significantly lower in the Group P vs Group C (39.7 cm\(^2\) vs. 173.2 cm\(^2\), \(p=0.01\)). Needle path inside the tissue also trended lower in Group P (233.0 mm vs. 630.0 mm), as did total procedure time (151s vs. 254s), however these values did not reach statistical significance at our sample size.

Discussion: This pilot study has demonstrated that learning ultrasound-guided lumbar puncture in pathological spine models may be improved by augmented reality 3-D visualization, and warrants further study.

References:
Introduction: Recent data suggests that graduating physicians are becoming less interested in an academic career. Within anesthesia, there has also been a documented decline in both basic and clinical research over the last two decades. It has been proposed that fostering resident interest in fellowship training and research can promote future academic physicians. This study aimed to determine preferences of Canadian anesthesia residents towards fellowships, academic practice, and future research activities and elucidate factors that affect those preferences.

Methods: An anonymous online survey was sent to all anesthesiology residents currently enrolled in an accredited Canadian anesthesiology residency program. Local ethics committee approval was obtained prior to survey distribution. Information relating to demographics, and data on fellowship training, practice setting, and research were collected from the survey. A multivariable logistic regression model was used to determine significant factors associated with the decision to pursue a fellowship, an academic practice, and research after residency.

Results: The response rate of the survey was 44.7% (244 respondents) of all Canadian anesthesia residents. The mean age of residents was 30 years (SD 4.1). Thirty-five residents (14.3%) possessed a Master’s degree and 11 residents (4.5%) possessed a PhD. Seventy percent of residents indicated that they plan on pursuing fellowship training. The top three sought after fellowships were regional anesthesia (34.1%), intensive care (32.3%), and acute/chronic pain (25.0%). Enhanced employability, personal interest, and interest in an academic career were the top factors most influential in the decision to pursue a fellowship. Male gender significantly predicted a resident’s decision to pursue fellowship training (adjusted odds ratio (OR) 1.87, 95% CI 1.03 to 3.40, p = 0.04) while presence of a graduate degree reduced a resident’s decision (adjusted OR 0.52, 95% CI 0.30 to 0.91, p = 0.02). Fifty-seven percent of residents preferred to work at an academic institution upon graduating. Although 70% of residents indicated current involvement in research activities, only 34% indicated a desire to incorporate research into their future practice. Interest, lifestyle demands, and lack of experience were top factors most influential in the decision to pursue research after residency. Current research activity (adjusted OR 3.50, 95% CI 1.56 to 7.90, p = 0.003) and publishing while in residency (adjusted OR 4.40, 95% CI 2.02 to 9.56, p < 0.001) were the only significant factors associated with the intention of future research activities.

Discussion: Although the majority of Canadian anesthesia residents intend on pursuing fellowship training, only a third intend on pursuing research activities after residency. Several factors have been identified that influence an anesthesia resident’s decision to pursue a fellowship, academic practice, or future research. Initiatives to promote future research activities should focus on promoting interest and exposure to research while in residency.

References:
Introduction: Simulation-based learning is increasingly used by healthcare professionals to safely learn and practice non-technical skills related to crisis resource management (CRM). This systematic review was conducted to better understand the impact of simulation-based CRM teaching in terms of transfer of learning to the workplace and subsequent changes in patient outcomes.

Methods: Research Ethics Board approval was not required. Studies published up to September 2012 on CRM, crisis management, crew resource management, teamwork, and simulation were searched in Medline, EMBASE, CINAHL, Cochrane Central Register of Controlled Trials, and ERIC. All studies that used simulation based CRM teaching with outcomes measured at Kirkpatrick level 3 (transfer of learning to workplace) or 4 (patient outcome) were included. Studies where technical skills and nontechnical skills could not be separated and studies that only measured reaction of learners or simple learning (Kirkpatrick level 1 or 2) were excluded. No limitations were placed on the level of learners or study design. All titles and abstracts identified were independently reviewed for eligibility by two authors.

Results: We identified nine articles for inclusion that measured transfer of simulation-based CRM learning into the clinical setting, and/or translated to improved patient outcomes. All studies concluded that simulation-based CRM training may offer an additive benefit to the traditional didactic instruction, enhance CRM healthcare crisis management teaching impact provider’s performance, and/or may have a positive impact on patients’ management and outcomes.

Discussion: Despite an abundance of existing literature on simulation-based education and CRM, we identified only nine articles that examined transfer of learning to workplace for healthcare providers or changes in patient outcome after simulation-based CRM training. The vast majority of the literature has been limited to lower level outcomes, such as reaction of participants and learning that has been measured using further simulation scenarios which leaves the studies open to the criticism that learners may have only been taught to perform well in the simulator, and not necessarily in real life. Based on a small number of studies, this systematic review found that CRM skills learnt at the simulation center are transferred to clinical settings, and that the acquired CRM skills can translate to improved patient outcomes.

References:
N/A
Introduction: Anaesthesia is difficult to practice safely in the developing world where there are severe shortages of personnel, drugs, equipment and training. Non-technical skills are critical in an environment with major clinical demands, few mentors, and scarce resources. Fostering communication skills amongst healthcare professionals is critical for patient safety. This pilot study investigates whether low-fidelity instructor-driven simulation can provide effective teaching of anaesthetists' non-technical skills (ANTS) in a developing world context.

Methods: Study participants were anaesthesia technicians and residents. The study took place between July 2012 and January 2013. Baseline observations were made of 20 anaesthesia providers during elective and urgent Caesarean sections to assess non-technical skills using the established ANTS framework. More than one observer was used therefore observer calibration was done prior to starting the study. After the first observation participants were randomized to either the control or intervention group. Observers were blinded to participant allocation. The intervention group underwent training of ANTS using low-fidelity instructor-driven simulation with debriefing. All 20 participants were then observed again.

Results: The primary outcome was the overall ANTS score out of 16. Median ANTS score of the simulation group was 13.5 (11, 16) and that of the control group 8 (8, 9) and was statistically significant at p = 0.0016. Simulation participants showed statistically significant improvement in both subcategories and in the overall ANTS score compared with ANTS score prior to simulation exposure. The category with the most significant improvement was team working. Observer concordance was established with a Kendall W coefficient that was significant.

<table>
<thead>
<tr>
<th>Second observation ANTS scores</th>
<th>Simulation group (N = 10)</th>
<th>Control group (N = 10)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task management (median, interquartile range)</td>
<td>3 (3, 4)</td>
<td>2 (2, 2)</td>
<td>0.0017</td>
</tr>
<tr>
<td>Team working (median, interquartile range)</td>
<td>4 (2, 4)</td>
<td>2 (2, 2)</td>
<td>0.0061</td>
</tr>
<tr>
<td>Situational awareness (median, interquartile range)</td>
<td>3 (3, 4)</td>
<td>2 (2, 2)</td>
<td>0.0052</td>
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<tr>
<td>Decision making (median, interquartile range)</td>
<td>3.5 (3, 4)</td>
<td>2.5 (2, 3)</td>
<td>0.0087</td>
</tr>
<tr>
<td>Overall score (median, interquartile range)</td>
<td>13.5 (11, 16)</td>
<td>8 (8, 9)</td>
<td>0.0016</td>
</tr>
</tbody>
</table>
**Discussion:** Anaesthesia providers show an improvement in their non-technical skills in the operating room environment with as little as one teaching session using low fidelity instructor driven simulation with debriefing. High fidelity simulators involve computer driven interactive mannequins that recreate an authentic environment. This set up has been used successfully to teach anaesthetists’ non-technical skills (ANTS). However, high fidelity simulators are unaffordable in most developing countries. Psychological fidelity, or the degree to which the simulation captures the skills needed in the actual task, could be as important as physical fidelity. With this in mind, low fidelity, instructor-driven simulation has the potential to create a valuable learning situation. This method of training could be applied to many resource-limited settings to improve non-technical skills for anaesthesia providers with the goal of making surgery safer.

**References:**


![ANTS Score Control Group vs Simulation Group](image-url)
Introduction: Previous studies have found that trainees do not routinely receive instruction in how to effectively perform disclosure, despite the existence of guidelines. (1,2) Trainees are often excluded from disclosure meetings, missing a valuable learning experience. Assessing complex skills such as ability to perform communication and professionalism skills necessary for a successful disclosure meeting during a clinical rotation is difficult.

The objective of our study was to explore how anesthesia residents prepare for a disclosure meeting after the occurrence of an adverse event in a simulated environment.

Methods: REB approval and informed consent were obtained from 21 anesthesia residents from a single academic institution. A tripartite simulation scenario was constructed which comprised of: a clinical emergency (treating a morphine overdose), preparation for a disclosure meeting, and the actual meeting. The resident was given 10 minutes to prepare for this meeting, the patient’s chart was provided and also internet access, telephone and a hard copy of the CPSI disclosure guidelines and the CMPA disclosure toolkit within line of sight.

Preparation for disclosure was classified as the chart only or the chart consultation plus other modality. Communication and Professional performances were scored using a previously described Generic Integrated Objective Assessment Tool (GIOSAT). Four trained raters blinded form residents’ identity and preparation modality scored the disclosure videos. Comparison: Our primary outcome was the comparison between preparation modality with Communication and Professional scores. Our secondary outcome was the correlation between post-graduate year of residency (PGY) with Communicator and Professional scores. Students’ t test and Pearson correlation coefficients were performed using SPSS version 21.

Results: Twenty one residents participated in the study. Most participants used only the chart to prepare for disclosure. (Table 1) We found significant differences in communication scores (chart only 4.0 SD .41, Other modality 4.5 SD .52, p=.02) but Professional scores were not significant (chart only 4.37 SD ± .55, other modality 4.9 SD ± 81, p=.08. There was significant correlation between Professional scores and PGY (r=0.56, p=.008), but correlations between PGY Communication scores (r=.36, p=.10) did not reach significance.

Debriefing session revealed that most residents did not know about the disclosure guidelines and that they don’t receive formal teaching this topic. Complications are rare and most of the time the staff performs the disclosure. They found the guidelines useful to prepare disclosure.

Conclusions: Disclosure seems to be not part of the formal curriculum for anesthesia residents. Disclosure is recommended to be formally taught by multiple institutions. Simulation could be an option to fill the gap between the formal and hidden curriculum in some professionalism topics such as disclosure, not only for learning but also for assessing.

The availability, knowledge and application of the disclosure guidelines appear to improve communication skills in anesthesia residents disclosing harmful events to patients.

References:
2. www.cmpra-acpm.ca
3. Canadian journal of anaesthesia60 (3), 280-289.
<table>
<thead>
<tr>
<th>Preparation</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only use the Chart</td>
<td>15 (71.4)</td>
</tr>
<tr>
<td>Use the CMPA Guidelines</td>
<td>4 (19)</td>
</tr>
<tr>
<td>Call Staff</td>
<td>1 (4.7)</td>
</tr>
<tr>
<td>Clarify with the nurse</td>
<td>1 (4.7)</td>
</tr>
</tbody>
</table>

N= 21 anesthesia residents. CMPA: Canadian Medical Protective Association.