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May 2015

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1. Title: A model of cardiopulmonary bypass staged training integrating technical and non-technical skills dedicated to cardiac trainees
Citation: Perfusion (United Kingdom), March 2015, vol./is. 30/2(132-139), 0267-6591;1477-111X (16 Mar 2015)
Author(s): Fouilloux V., Doguet F., Kotsakis A., Dubrowski A., Berdah S.
Language: English
Abstract: Objectives: To develop a standardized simulation-based curriculum to teach medical knowledge and technical, communication and critical thinking skills necessary to initiate and wean from cardiopulmonary bypass (CPB) to junior cardiac trainees (CTs) in France. Performance on post-curricular tests was compared between CTs who participated in the new curriculum to those who did not. Methods: The simulation-based curriculum was developed by content and education experts. Simulations sequentially taught the skills necessary for initiating and weaning from CPB as well as managing crises by adding fidelity and complexity to scenarios. Nine CTs were randomly assigned to the new curriculum (n=5) or the traditional curriculum (n=4). Skills were assessed using tests of medical knowledge and technical, communication (GRS) and critical thinking (SCT) skills. A two-sample Wilcoxon rank-sum test compared average scores between the two groups. Alpha of 0.05 was set to indicate statistically significant differences. Results: The results revealed that CTs in the new curriculum significantly outperformed CTs in the traditional curriculum on technical (18.2 vs 14.8, p=0.05) and communication (3.5 vs 2.2, p=0.013) skills. There was no significant difference between CTs in the new curriculum in the Script Concordance Test (16.5 vs 14.8, p=0.141) and knowledge tests (26.9 vs 24.6, p=0.14) compared to CTs in the traditional curriculum. Conclusion: Our new curriculum teaches communication and technical skills necessary for CPB. The results of this pilot study are encouraging and relevant. They give grounds for future research with a larger panel of trainees. Based on the current distribution of scores, a sample size of 12 CTs per group should yield significant results for all tests.
Publication type: Journal: Article
Source: EMBASE
Full text: Available EBSCOhost at Perfusion
Full text: Available EBSCOhost at Perfusion

2. Title: A systematic review of validity evidence for checklists versus global rating scales in simulation-based assessment.
Citation: Medical Education, 01 February 2015, vol./is. 49/2(161-173), 03080110
Author(s): Ilgen, Jonathan S, Ma, Irene W Y, Hatala, Rose, Cook, David A
Language: English
Abstract: Context The relative advantages and disadvantages of checklists and global rating scales (GRSs) have long been debated. To compare the merits of these scale types, we conducted a systematic review of the validity evidence for checklists and GRSs in the context of simulation-based assessment of health professionals. Methods We conducted a systematic review of multiple databases including MEDLINE, EMBASE and Scopus to February 2013. We selected studies that used both a GRS and checklist in the simulation-based assessment of health professionals. Reviewers working in duplicate evaluated five domains of validity evidence, including correlation between scales and reliability. We collected information about raters, instrument characteristics, assessment context, and task. We pooled reliability and correlation coefficients using random-effects meta-analysis. Results We found 45 studies that used a checklist and GRS in simulation-based assessment. All studies included physicians or physicians in training; one study also included nurse anaesthetists. Topics of assessment included open and laparoscopic surgery (n = 22), endoscopy (n = 8), resuscitation (n = 7) and anaesthesiology (n = 4). The pooled GRS-checklist correlation was 0.76 (95% confidence interval [CI] 0.69-0.81, n = 16 studies). Inter-rater reliability was similar between scales (GRS 0.78, 95% CI 0.71-0.83, n = 23; checklist 0.81, 95% CI 0.75-0.85, n = 21), whereas GRS inter-item reliabilities (0.92, 95% CI 0.84-0.95, n = 6) and inter-station reliabilities (0.80, 95% CI 0.73-0.85, n = 10) were higher than those for checklists (0.66, 95% CI 0-0.84, n = 4 and 0.69, 95% CI 0.56-0.77, n = 10, respectively). Content evidence for GRSs usually referenced previously reported instruments (n = 33), whereas content evidence for checklists usually described expert consensus (n = 26). Checklists and GRSs usually had similar evidence for relations to other variables. Conclusions Checklist inter-rater reliability and trainee discrimination were more favourable than suggested in earlier work, but each task requires a separate checklist. Compared with the checklist, the GRS has higher average
Abstract: Equipment-related malfunctions during minimally invasive surgery (MIS) are common and threaten patient safety. As they occur in the periphery of the surgeon’s vision, the surgical team requires a high level of situational awareness in order to intercept these errors timely. A serious game has been developed to train surgical residents to deal with equipment-related errors. This study investigates to what extent surgical educators and trainees would accept a serious game as a training method. Materials and Methods: A cross-sectional survey was conducted among 45 surgeons, surgical residents, and medical students who played the serious game at a scientific convention. The questionnaire contained statements on perceived realism, usefulness, teaching capability, user experience and application toward surgical training. Results were analyzed according to participants’ MIS experience (“expert," "intermediate," and "novice"). Results: The majority found that important medical constructs are represented realistically (64.4%-88.9%) and indicated the game to be particularly useful for training operating room nurses and surgical residents (75%-86%). Both educators and trainees found the game to be useful for surgical training (53%). Serious gaming was viewed as positive (78%) and challenging (60%), and 66% would play the game in their leisure time. Licensed surgeons perceived the game more frequently as boring than the intermediate-level and trainee groups (23.5% versus 6.7% and 8.3%; P=.045). Conclusions: This is the first study to show acceptance of a serious game as a training format in surgical training by educators and trainees. Future research should investigate whether the serious game indeed improves problem-solving and situational awareness in the operating room.

Publication type: journal article
Source: CINAHL

Abstract: Combining technical and non-technical skills within a simulation-based ureteroscopy curriculum-a randomised controlled trial

Citation: European Urology, Supplements, April 2015, vol./is. 14/2(e489-e489a), 1569-9056 (April 2015)


Language: English

INTRODUCTION & OBJECTIVES: Whilst various individual training modalities exist and have been validated to varying degrees within ureteroscopy, little research has been conducted to integrate these within a curriculum. Furthermore, non-technical skills play a large role within surgical practice and errors but little has been done to combine these skills with technical skills teaching. This study therefore aimed to: 1. Develop a simulation based curriculum integrating technical and non-technical skills training and assessment 2. Validate the curriculum in terms of feasibility, acceptability, content validity and educational impact MATERIAL & METHODS: The curriculum was developed utilising the Delphi methodology with six experts. Three simulator modalities were incorporated into the curriculum; the URO Mentor, the Uro-Scopic Trainer and the distributed simulator for full immersion simulation. A randomised trial with 32 medical students subsequently evaluated the curriculum. Half underwent the curriculum with the other half acting as controls. Both were subsequently assessed within the full immersion environment to assess both skill sets. Videos of participants' performance were analysed by two blinded experts. Participants then filled out post-study questionnaires. RESULTS: Content validation was achieved through the curriculum development process. All parameters recorded demonstrated a significant improvement within the intervention cohort. The task was performed significantly faster (933 vs. 1617 seconds, p<0.001) with OSATS (23.5 vs. 14.8, p<0.001) and task specific checklist scores (73.4 vs. 60.4, p=0.011) significantly higher, demonstrating an improved technical skillset within the intervention group. Additionally, non-technical skills were improved as demonstrated by an improved NOTSS score (13.1 vs. 9.1, p<0.001). Post study questionnaire results demonstrated the curriculums acceptability and feasibility. CONCLUSIONS: The present study demonstrates a validated curriculum within ureteroscopy utilising the available training modalities. Additionally, it has been demonstrated that integrating the teaching and assessment of technical and non-technical skills within one training pathway is not only feasible, but also educationally valuable. This may be useful for the development of future curricula for other procedures. (Figure
5. Title: Current opinions of program directors on the role of simulation in urological residency training

Citation: Journal of Urology, April 2015, vol./is. 193/4 SUPPL. 1(e270-e271), 0022-5347 (April 2015)

Author(s): Eltahawy E., Powell R., Thrush C., Berry K., Lacefield E., Kamel M.

Language: English

Abstract: INTRODUCTION AND OBJECTIVES: Although simulation has become increasingly accessible, urology residency training has continued to teach technical skills through hands-on experience without a nationally-adopted curriculum for teaching and testing these skills. In this study, we survey the current usage of simulation, the receptiveness to incorporating a simulation curriculum if one were made available, and the barriers to implementing it into the residency training programs. METHODS: All residency program directors at the 122 ACGME-accredited urology training programs in the United States were invited to complete an anonymous electronic survey. A total of 43 completed surveys were received (35% response rate). The first portion of the study included 9 questions evaluating the program director experiences with, current usage of, and opinions of existing urology simulators. The second portion of the questionnaire elicited responder opinions on the receptiveness of incorporating a simulation program into the training curriculum and the barriers to implementing said curriculum RESULTS: Among responders, up to 40% had prior experience with simulators during residency training and 97% report having access to a simulation education center for their urology residents. Of those, 58% have incorporated simulation into their curriculum. Laparoscopic/Robotic simulators, and TURP are the most commonly used (95 and 26% respectively), and thought to be the most realistic and useful. 87% of Responders agree there is a role for a standardized simulator training curriculum and 90% agree that simulators are a useful tool for teaching surgical techniques and would improve performance in the OR. 64% agree cost is a limiting factor for using simulators in the training program. 12% agree on the cost-effectiveness of simulators, 15% agree on simulators have been validated as an educational tool, 55% agree on whether faculty would be willing to participate in administrating the simulation curriculum, 35% agree on whether there is an increased need for simulator education with the 80-hour work week limitations, and 38% agree on whether a simulation program would reduce patient risks and complications. CONCLUSIONS: The majority of program director respondents believe there is a role for incorporating a simulation curriculum as part of the urology training, but barriers to implementing this include cost burden, need for constant technology updates, need for advanced planning, and the willingness of the faculty to participate in administration.

Publication type: Journal: Conference Abstract
Source: EMBASE

Full text: Available Elsevier at Salisbury District Hospital Healthcare Library

6. Title: Current status of robotic simulators in acquisition of robotic surgical skills

Citation: Current Opinion in Urology, March 2015, vol./is. 25/2(168-174), 0963-0643;1473-6586 (06 Mar 2015)

Author(s): Kumar A., Smith R., Patel V.R.

Language: English

Abstract: This article provides an overview of the current status of simulator systems in robotic surgery training curriculum, focusing on available simulators for training, their comparison, new technologies introduced in simulation focusing on concepts of training along with existing challenges and future perspectives of simulator training in robotic surgery. RECENT FINDINGS: The different virtual reality simulators available in the market like dVSS, dVT, RoSS, ProMIS and SEP have shown face, content and construct validity in robotic skills training for novices outside the operating room. Recently, augmented reality simulators like HoST, Maestro AR and RobotiX Mentor have been introduced in robotic training providing a more realistic operating environment, emphasizing more on procedure-specific robotic training. Further, the Xperience Team Trainer, which provides training to console surgeon and bedside assistant simultaneously, has been recently introduced to emphasize the importance of teamwork and proper coordination. SUMMARY: Simulator training holds an important place in current robotic training curriculum of future robotic surgeons. There is a need for more procedure-specific augmented reality simulator training, utilizing advancements in computing and graphical capabilities for new innovations in simulator technology. Further studies are required to establish its cost-benefit ratio along with concurrent and predictive validity.

Publication type: Journal: Review
Source: EMBASE

7. Title: Debriefing after simulation-based non-technical skill training in healthcare: a systematic review of

Publication type: Journal: Conference Abstract
Source: EMBASE
The present study demonstrates such a validated curriculum within ureteroscopy. Additionally, this study characterized skills gained by the validated curriculum. The intervention cohort performed the task in less time (933 vs. 1617 seconds, p<0.001) with two objective rating scales demonstrating significantly better technical skills (OSATS = 23.5 vs. 14.8, p<0.001) and task specific checklist scores = 73.4 vs. 60.4, p=0.011). Non-technical skills were improved as demonstrated by increased NOTSS scores (13.1 vs. 9.1, p<0.001). Additionally, content validation was achieved via the development process with both acceptability and feasibility shown through post-study questionnaire results. CONCLUSIONS: Simulation-based training must not rely on individual use of models but instead should be used within a comprehensive curriculum. The present study demonstrates such a validated curriculum within ureteroscopy. Additionally, this study demonstrates that integrating technical and non-technical skills teaching and assessment within one training pathway is feasible and educational. (Figure Presented).

**Abstract:**

INTRODUCTION AND OBJECTIVES: Within ureteroscopy various training modalities have been developed, however for best utilization these must be utilised within a structured curriculum. Additionally, non-technical skills are a common cause of surgical errors but these are often not integrated with technical skills teaching. We therefore aimed to develop and evaluate a simulation-based ureteroscopy curriculum that combined technical and non-technical skills training and assessment. METHODS: Delphi methodology with six experts was used for the development of the curriculum. A virtual reality, bench top and full immersion training modality were incorporated within the curriculum to teach both skillsets together. Evaluation of the curriculum was conducted via a randomised controlled trial of 32 medical students. Sixteen participants underwent the full simulation-based curriculum with the other sixteen acting as controls. Assessment then took place within the full immersion environment to assess both skillsets. Video analysis of the participants performance was performed by two blinded assessors. All participants then filled out post-study questionnaires. RESULTS: Both technical and non-technical skills were improved within the intervention cohort. They performed the task in less time (933 vs. 1617 seconds, p<0.001) with two objective rating scales demonstrating significantly better technical skills (OSATS = 23.5 vs. 14.8, p<0.001 and task specific checklist scores = 73.4 vs. 60.4, p=0.011). Non-technical skills were improved as demonstrated by increased NOTSS scores (13.1 vs. 9.1, p<0.001). Additionally, content validation was achieved via the development process with both acceptability and feasibility shown through post-study questionnaire results. CONCLUSIONS: Simulation-based training must not rely on individual use of models but instead should be used within a comprehensive curriculum. The present study demonstrates such a validated curriculum within ureteroscopy. Additionally, this study demonstrates that integrating technical and non-technical skills teaching and assessment within one training pathway is feasible and educational. (Figure Presented).

**Title:** Development and validation of an integrated skills curriculum within ureteroscopy: a randomised controlled trial

**Citation:** Journal of Urology, April 2015, vol./is. 193/4 SUPPL. 1(e244-e245), 0022-5347 (April 2015)


**Language:** English
Abstract: Nowadays, accessibility to the operative room is becoming more limited for medical students and residents, principally due to decreasing operative time, increasing waiting list, ethical consideration and legal issue in case of any complications. Simulation models have gained in popularity and are now considered a major component in the training and skill development of medical students and residents before coming to the operative room. In this review, we summarized and discussed the relevant aspect of ureteroscopy training models and gave an overview of the advantage in skill acquisition while training with a high-fidelity model. RECENT FINDINGS: Currently, there is an increase in surgical programs trying to implement endourology training models into the curriculum. The training simulators that would allow the medical students and residents to rapidly reach an autonomous level are yet to be developed. Several ureteroscopy models have been described and validated; however, the transposition of skill acquisition into real-life surgery is not properly demonstrated. SUMMARY: Training reduces the learning curve for novice medical students or residents. However, further studies are still needed to better define the impact of skill acquisition in real life and its sustainability.

Publication type: Journal: Review
Source: EMBASE

10. Title: Innovative approach using interprofessional simulation to educate surgical residents in technical and nontechnical skills in high-risk clinical scenarios
Citation: JAMA Surgery, March 2015, vol./is. 150/3(201-207), 2168-6254 (01 Mar 2015)
Author(s): Nicksa G.A., Anderson C., Fidler R., Stewart L.
Language: English
Abstract: Importance: The Accreditation Council for Graduate Medical Education core competencies stress nontechnical skills that can be difficult to evaluate and teach to surgical residents. During emergencies, surgeons work in interprofessional teams and are required to perform certain procedures. To obtain proficiency in these skills, residents must be trained. Objective: To educate surgical residents in leadership, teamwork, effective communication, and infrequently performed emergency surgical procedures with the use of interprofessional simulations. Design, Setting, and Participants: SimMan 3GSwas used to simulate high-risk clinical scenarios (15-20 minutes), followed by debriefings with real-time feedback (30 minutes). A modified Oxford Non-Technical Skills scale (score range, 1-4) was used to assess surgical resident performance during the first half of the academic year (July-December 2012) and the second half of the academic year (January-June 2013). Anonymous online surveys were used to solicit participant feedback. Simulations were conducted in the operating room, intensive care unit, emergency department, ward, and simulation center. A total of 43 surgical residents (postgraduate years [PGYs] 1 and 2) participated in interdisciplinary clinical scenarios, with other health care professionals (nursing, anesthesia, critical care, medicine, respiratory therapy, and pharmacy; mean number of nonsurgical participants/session: 4, range 0-9). Thirty seven surgical residents responded to the survey. Exposures: Simulation of high-risk clinical scenarios: postoperative pulmonary embolus, pneumothorax, myocardial infarction, gastrointestinal bleeding, anaphylaxis with a difficult airway, and pulseless electrical activity arrest. Main outcomes and measures: Evaluation of resident skills: communication, leadership, teamwork, problem solving, situation awareness, and confidence in performing emergency procedures (eg, cricothyroidotomy). Results: A total of 31 of 35 (89%) of the residents responding found the sessions useful. Additionally, 28 of 33 (85%) reported improved confidence doing procedures and 29 of 37 (78%) reported knowing when the procedure should be applied. Oxford Non-Technical Skills evaluation demonstrated significant improvement in PGY 2 resident performance assessed during the 2 study periods: communication score increased from 3 to 3.71 (P = .01), leadership score increased from 2.77 to 3.86 (P < .001), teamwork score increased from 3.15 to 3.86 (P = .007), and procedural ability score increased from 2.23 to 3.43 (P = .03). There were no statistically significant improved scores in PGY 2 decision making or situation awareness. No improvements in skills were seen among PGY 1 participants. Conclusions and Relevance: The PGY 2 residents improved their skills, but the PGY 1 residents did not. Participants found interprofessional simulations to be realistic and a valuable educational tool. Interprofessional simulation provides a valuable means of educating surgical residents and evaluating their skills in real-life clinical scenarios.

Publication type: Journal: Article
Source: EMBASE

11. Title: Is there a correlation between technical skills and non-technical skills performance within ureteroscopy?
Citation: Journal of Urology, April 2015, vol./is. 193/4 SUPPL. 1(e268-e269), 0022-5347 (April 2015)
Language: English
Abstract: INTRODUCTION AND OBJECTIVES: A surgeon requires much more than just good technical skills, with non-
Conscientiousness may correlate with resident technical performance. Level of training alone does not seem to correlate with technical and non-technical communication scores (p=0.09). CONCLUSIONS: Resident level of training and laparoscopic experience correlated assessed, level of training correlated with dimension of the BFI correlated with technical score (p=0.03) and pass/fail rating (p=0.04). Of the 4 NOTSS domains technical performance (13.8 vs 10.1, p=0.03). Technical score correlated with NOTSS score (p<0.01) and pass/fail rating (p=0.01). Only the conscientiousness relationship between technical skills and non-technical skills is best correlated with technical skills performance, demonstrating how crucial all skillsets are. The demonstration of the correlation between these skillsets shows how these two skillsets should not be treated as separate entities, but instead should be trained and assessed together.

**Publication type:** Journal: Conference Abstract

**Source:** EMBASE

**Full text:** Available Elsevier at Salisbury District Hospital Healthcare Library

**Full text:** Available Elsevier at Journal of Urology, The

1.2. Title: Laparoscopic IVC injury management training-predicting technical & non-technical skills

**Citation:** Journal of Urology, April 2015, vol./is. 193/4 SUPPL. 1(e244), 0022-5347 (April 2015)

**Author(s):** Lee J., Blankstein U., Hoang R., Ordon M., Pace K.

**Language:** English

**Abstract:** INTRODUCTION AND OBJECTIVES: Major vascular injuries during laparoscopic surgery, though rare, can lead to significant patient morbidity. Simulation-based team training (SBTT) provides an opportunity to experience such rare OR crisis scenarios in a safe environment, working on both technical & non-technical skills. We developed a unique SBTT laparoscopic IVC injury scenario and conducted an observational study to determine predictors of surgeon performance. METHODS: Urology residents from our institution were recruited to participate in a SBTT laparoscopic nephrectomy exercise (trainees were unaware of complications). Residents completed both a demographic & multidimensional personality questionnaire (BFI) and were instructed to play the role of staff urologist. Study confederates included an anesthesiologist, surgical assistant, and scrub nurse. A vasovagal response to pneumoperitoneum and an IVC injury event were scripted into the scenario. Resident performance in managing these events was video-recorded. All scenarios ended with either successful repair of the IVC injury, decision to convert to open repair, or max blood loss (2.5L). Technical and non-technical (NOTSS) skills were assessed by expert laparoscopic surgeons using validated tools. The Chi-square, Mann-Whitney U, ANOVA, and Pearson and Spearman correlations were utilized as indicated for statistical analysis. RESULTS: Fifteen urology residents participated (10 Jr & 5 Sr residents). Mean EBL was 1.98L and 5 residents were unable to complete the exercise safely. Sr residents had more laparoscopic nephrectomy experience (p<0.01) but were similar to Jr residents in prior SBTT experience and on baseline BFI personality scores. Sr residents outperformed Jrs on both technical (15.1 vs 9.9, p<0.01) and NOTSS performance (13.8 vs 10.1, p=0.03). Technical score correlated with NOTSS score (p<0.01) and pass/fail rating correlated with technical performance (p<0.01), NOTSS score (p=0.02), and EBL (p<0.01). Only the conscientiousness dimension of the BFI correlated with technical score (p=0.03) and pass/fail rating (p=0.04). Of the 4 NOTSS domains assessed, level of training correlated with situation awareness, decision making, and leadership scores but not with communication scores (p=0.09). CONCLUSIONS: Resident level of training and laparoscopic experience correlated with technical and non-technical performance during a simulated laparoscopic IVC injury scenario. Conscientiousness may correlate with resident technical performance. Level of training alone does not seem to predict communication & teamwork skills.

**Publication type:** Journal: Conference Abstract

**Source:** EMBASE
13. Title: Randomized controlled trials: a systematic review of laparoscopic surgery and simulation-based training.

Citation: Global journal of health science, Mar 2015, vol. 7, no. 2, p. 310-327, 1916-9736 (March 2015)
Author(s): Vanderbilt, Allison A, Grover, Amelia C, Pastis, Nicholas J, Feldman, Moshe, Granados, Deborah Diaz, Murithi, Lydia K, Mainous, Arch G

Abstract: This systematic review was conducted to analyze the impact and describe simulation-based training and the acquisition of laparoscopic surgery skills during medical school and residency programs. This systematic review focused on the published literature that used randomized controlled trials to examine the effectiveness of simulation-based training to develop laparoscopic surgery skills. Searching PubMed from the inception of the databases to May 1, 2014 and specific hand journal searches identified the studies. This current review of the literature addresses the question of whether laparoscopic simulation translates the acquisition of surgical skills to the operating room (OR). This systematic review of simulation-based training and laparoscopic surgery found that specific skills could be transferable to the OR. Twenty-one studies reported learning outcomes measured in five behavioral categories: economy of movement (8 studies); suturing (3 studies); performance time (13 studies); error rates (7 studies), and global rating (7 studies). Simulation-based training can lead to demonstrable benefits of surgical skills in the OR environment. This review suggests that simulation-based training is an effective way to teach laparoscopic surgery skills, increase translation of laparoscopic surgery skills to the OR, and increase patient safety; however, more research should be conducted to determine if and how simulation can become apart of surgical curriculum.

Source: Medline

Full text: Available ProQuest at Global Journal of Health Science

14. Title: Rescuing the obese or burned airway: are conventional training manikins adequate? A simulation study.

Citation: British journal of anaesthesia, Jan 2015, vol. 114, no. 1, p. 136-142 (January 2015)
Author(s): Howes, T E, Lobo, C A, Kelly, F E, Cook, T M

Abstract: Percutaneous tracheal access is required in more than 40% of major airway emergencies, and rates of failure are high among anaesthetists. Supraglottic airway management is more likely to fail in patients with obesity or neck pathology. Commercially available manikins may aid training. In this study, we modified a standard ‘front of neck’ manikin and evaluated anaesthetists’ performance of percutaneous tracheal access. Two cricothyroidotomy training manikins were modified using sections of belly pork to simulate a morbidly obese patient and an obese patient with neck burns. An unmodified manikin was used to simulate a slim patient. Twenty consultant anaesthetists were asked to manage a ‘can’t intubate, can’t ventilate’ scenario involving each of the three manikins. Outcome measures were success using their chosen technique and time to first effective breath. Success rates using first-choice equipment were: ‘slim’ manikin 100%, ‘morbidly obese’ manikin 60%, and ‘burned obese’ manikin 77%. All attempts on the ‘slim’ manikin succeeded within 240 s, the majority within 120 s. In attempts on the ‘morbidly obese’ manikin, 60% succeeded within 240 s and 20% required more than 720 s. All attempts on the ‘burned obese’ manikin succeeded within 180 s. Significantly greater technical difficulty was experienced with our ‘morbidly obese’ manikin compared with the unmodified manikin. Failure rates and times to completion were considerably more consistent with real-life reports. Modifying a standard manikin to simulate an obese patient is likely to better prepare anaesthetists for this challenging situation. Development of a commercial manikin with such properties would be of value. © The Author 2014. Published by Oxford University Press on behalf of the British Journal of Anaesthesia. All rights reserved. For Permissions, please email: journals.permissions@oup.com.

Source: Medline

15. Title: Self-regulated learning in simulation-based training: a systematic review and meta-analysis.

Citation: Medical Education, 01 April 2015, vol./is. 49/4(368-378), 03080110
Author(s): Brydges, Ryan, Manzone, Julian, Shanks, David, Hatala, Rose, Hamstra, Stanley J, Zendejas, Benjamin, Cook, David A

Language: English

Abstract: Context Self-regulated learning (SRL) requires an active learner who has developed a set of processes for managing the achievement of learning goals. Simulation-based training is one context in which trainees can safely practise learning how to learn. Objectives The purpose of the present study was to evaluate, in the simulation-based training context, the effectiveness of interventions designed to support trainees in SRL activities. We used the social-cognitive model of SRL to guide a systematic review and meta-analysis exploring the links between instructor supervision, supports or scaffolds for SRL, and educational outcomes. Methods We searched databases including...
16. Title: Simulation for Skills-based Education in Pulmonary and Critical Care Medicine.
   Citation: Annals of the American Thoracic Society, Apr 2015, vol. 12, no. 4, p. 579-586 (April 2015)
   Abstract: The clinical practice of pulmonary and critical care medicine requires procedural competence in many technical domains, including vascular access, airway management, basic and advanced bronchoscopy, pleural procedures, and critical care ultrasonography. Simulation provides opportunities for standardized training and assessment in procedures without placing patients at undue risk. A growing body of literature supports the use and effectiveness of low-fidelity and high-fidelity simulators for procedural training and assessment. In this manuscript by the Skills-based Working Group of the American Thoracic Society Education Committee, we describe the background, available technology, and current evidence related to simulation-based skills training within pulmonary and critical care medicine. We outline working group recommendations for key procedural domains.
   Source: Medline
   Full text: Available ProQuest at Annals of the American Thoracic Society

17. Title: Simulation in the intensive care setting
   Citation: Best Practice and Research: Clinical Anaesthesiology, March 2015, vol./is. 29/1(51-60), 1521-6896;1532-169X (01 Mar 2015)
   Author(s): Eisold C., Poenicke C., Pfalzter A., Muller M.P.
   Language: English
   Abstract: About 10 years ago, the first human patient simulators were introduced to intensive care units (ICUs). Since then, there has been a rapid development of both technical and non-technical aspects in medical education. The aim of this review is to elaborate how simulation training is already used in the intensive care setting, the role of different types of commercially available mannequins and which benefits can be achieved for participants by using this teaching method. Furthermore, a practical example describes how a simulation curriculum can be designed, which challenges might need to be faced and which steps need to be taken to make the most out of the training. Human patient simulation is an effective tool in the education of health-care professionals and will surely become an important part in the training of ICU physicians as well.
   Publication type: Journal: Review
   Source: EMBASE

18. Title: Simulation in the operating room
   Citation: Best Practice and Research: Clinical Anaesthesiology, March 2015, vol./is. 29/1(41-50), 1521-6896;1532-169X (01 Mar 2015)
   Author(s): Murray A.W., Beaman S.T., Kampik C.W., Quinlan J.J.
   Language: English
   Abstract: Simulation has become a significant training tool in the operating room (OR). It can be used in both simple task training and complex scenarios. The challenge for simulation in the OR is how to translate that which is learned,
and perceived to beneficial, into behavioral change and improved patient outcomes. Simulation in the developing world is progressing, but is still hampered by a shortage of material, personnel funding.

**Publication type:** Journal: Review

**Source:** EMBASE

**19.Title:** Simulation-based medical education in pediatrics

**Citation:** Academic Pediatrics, March 2015, vol./is. 15/2(134-142), 1876-2859;1876-2867 (01 Mar 2015)

**Author(s):** Lopreiato J.O., Sawyer T.

**Language:** English

**Abstract:** The use of simulation-based medical education (SBME) in pediatrics has grown rapidly over the past 2 decades and is expected to continue to grow. Similar to other instructional formats used in medical education, SBME is an instructional methodology that facilitates learning. Successful use of SBME in pediatrics requires attention to basic educational principles, including the incorporation of clear learning objectives. To facilitate learning during simulation the psychological safety of the participants must be ensured, and when done correctly, SBME is a powerful tool to enhance patient safety in pediatrics. Here we provide an overview of SBME in pediatrics and review key topics in the field. We first review the tools of the trade and examine various types of simulators used in pediatric SBME, including human patient simulators, task trainers, standardized patients, and virtual reality simulation. Then we explore several uses of simulation that have been shown to lead to effective learning, including curriculum integration, feedback and debriefing, deliberate practice, mastery learning, and range of difficulty and clinical variation. Examples of how these practices have been successfully used in pediatrics are provided. Finally, we discuss the future of pediatric SBME. As a community, pediatric simulation educators and researchers have been a leading force in the advancement of simulation in medicine. As the use of SBME in pediatrics expands, we hope this perspective will serve as a guide for those interested in improving the state of pediatric SBME.

**Publication type:** Journal: Review

**Source:** EMBASE

**20.Title:** Simulation-based training improves nontechnical skills of general surgery residents: A pilot study

**Citation:** FASEB Journal, April 2015, vol./is. 29/1 Meeting Abstracts, 0892-6638 (April 2015)

**Author(s):** Nguyen N., Elliott J., Watson W., Dominguez E.

**Language:** English

**Abstract:** Background: Failures in non-technical skills (NTS) rather than technical expertise are frequently at the root of medical errors in the operating room (OR). NTS are the cognitive (decision making and situation awareness) and interpersonal (communication and teamwork) skills that are recognized, but not formally addressed in surgical training. Purpose: To examine the effect of simulation-based training (SBT) on NTS performance of surgical residents during laparoscopic cholecystectomy (LC). Setting: The study was carried out in a simulated OR that was arranged with standard equipment for LC, a high-fidelity patient simulator and a real OR team. Design: 11 surgery residents completed 2 identical SBT Sessions. For each Session, the resident was briefed on the LC case, completed the case in the simulated OR and debriefed his/her videotaped performance with a content expert. Assessment: 4 raters, blinded to the residents’ PGY level and the order of the videotaped Sessions, reviewed the recordings and scored the residents’ NTS using a perioperative Time Out checklist and Intraoperative LC checklist. Results: Scores on both checklists improved from Session 1 to Session 2, p<0.05, suggesting that SBT is effective for improving the NTS that underpin surgical proficiency. Conclusion: It could be reasonably argued that improved NTS of surgeons would reduce medical errors and improve patient safety in the OR.

**Publication type:** Journal: Conference Abstract

**Source:** EMBASE

**21.Title:** Surgeons' and trainees' perceived self-efficacy in operating theatre non-technical skills.

**Citation:** The British journal of surgery, May 2015, vol. 102, no. 6, p. 708-715 (May 2015)

**Author(s):** Pena, G, Altree, M, Field, J, Thomas, M J W, Hewett, P, Babidge, W, Maddern, G J

**Abstract:** An important factor that may influence an individual’s performance is self-efficacy, a personal judgement of capability to perform a particular task successfully. This prospective study explored newly qualified surgeons’ and surgical trainees' self-efficacy in non-technical skills compared with their non-technical skills performance in simulated scenarios. Participants undertook surgical scenarios challenging non-technical skills in two simulation sessions 6 weeks apart. Some participants attended a non-technical skills workshop between sessions. Participants completed pretraining and post-training surveys about their perceived self-efficacy in non-technical skills, which were analysed and compared with their performance in surgical scenarios in two simulation sessions. Change in performance between sessions was compared with any change in participants' perceived self-efficacy. There were
40 participants in all, 17 of whom attended the non-technical skills workshop. There was no significant difference in participants' self-efficacy regarding non-technical skills from the pretraining to the post-training. However, there was a tendency for participants with the highest reported self-efficacy to adjust their score downwards after training and for participants with the lowest self-efficacy to adjust their score upwards. Although there was significant improvement in non-technical skills performance from the first to second simulation sessions, a correlation between participants' self-efficacy and performance in scenarios in any of the comparisons was not found. The results suggest that new surgeons and surgical trainees have poor insight into their non-technical skills. Although it was not possible to correlate participants' self-belief in their abilities directly with their performance in a simulation, in general they became more critical in appraisal of their abilities as a result of the intervention. © 2015 BJSM Society Ltd Published by John Wiley & Sons Ltd.

Source: Medline

22. Title: Teaching a 'good' ward round.
Author(s): Powell, Natalie, Bruce, Christopher G, Redfern, Oliver
Abstract: Ward rounds are a vital part of hospital care and junior doctors play a key role in their delivery. Despite the importance of ward rounds to patient care and experience, we believe that junior doctors may lack the training and skills to carry them out most effectively. We designed a simulation-based training session focusing on ward round skills themed to key patient safety issues and have delivered the training to over 100 learners (medical students and foundation year one doctors). Few learners had any prior training in ward rounds. The session was highly valued by all participants and surveys completed both before and after the session showed statistically significant improvements in confidence in leading and documenting ward rounds. In addition, 94% of final year medical students and 93% of doctors felt such training should be included in the undergraduate curriculum. We believe there is a current gap in training around ward round skills and would strongly encourage simulation-based ward round training to be developed for undergraduates. Further sessions following qualification may then consolidate and develop ward round skills adapted to the level of the doctor. © 2015 Royal College of Physicians.
Source: Medline
Full text: Available ProQuest at Clinical Medicine

23. Title: The role and validity of surgical simulation.
Citation: International surgery, Feb 2015, vol. 100, no. 2, p. 350-357, 0020-8868 (February 2015)
Author(s): Agha, Riaz A, Fowler, Alexander J
Abstract: In the last three decades, simulation has become a key tool in the training of doctors and the maintenance of patient safety. Simulation offers an immersive, realistic way of learning technical skills. Recent changes to the training schemes in many surgical specialties mean that the hours spent working between senior house officer and consultant have been reduced. This, combined with other pressures (such as reduced operating hours), means that surgery has moved away from its traditional apprenticeship model and toward a competency-based one. Simulation can be a standardized and safe method for training and assessing surgeons. Use of simulation for training has become significant alongside the development of laparoscopic techniques, and evidence suggests that skills obtained in simulation are applicable in real clinical scenarios. Simulation allows trainees to make mistakes, to ask the "what if?" questions, and to learn and reflect on such situations without risking patient safety. Virtual reality simulators have been used to allow experts to plan complicated operations and assess perioperative risks. Most recently, fully immersive simulations, such as those with whole theater teams involved, and patient-centered simulations allow development of other key skills aside from purely technical ones. Use of simulation in isolation from traditional teaching methods will furnish the surgeon in training with skills, but the best time and place to use such skills comes only with experience. In this article we examine the role of simulation in surgical training and its impact in the context of reduced training time.
Source: Medline

24. Title: The role of simulation in continuing medical education for acute care physicians: A systematic review
Citation: Critical Care Medicine, January 2015, vol./is. 43/1(186-193), 0090-3493;1530-0293 (01 Jan 2015)
Author(s): Khanduja P.K., Bould M.D., Naik V.N., Hladkowicz E., Boet S.
Language: English
Abstract: Objectives: We systematically reviewed the effectiveness of simulation-based education, targeting independently practicing qualified physicians in acute care specialties. We also describe how simulation is used for performance assessment in this population. Data Sources: Data source included: DataMEDLINE, Embase, Cochrane Database of Systematic Reviews, Cochrane CENTRAL Database of Controlled Trials, and National Health Service
Economic Evaluation Database. The last date of search was January 31, 2013. Study Selection: All original research describing simulation-based education for independently practicing physicians in anesthesiology, critical care, and emergency medicine was reviewed. Data Extraction: Data analysis was performed in duplicate with further review by a third author in cases of disagreement until consensus was reached. Data extraction was focused on effectiveness according to Kirkpatrick's model. For simulation-based performance assessment, tool characteristics and sources of validity evidence were also collated. Data Synthesis: Of 39 studies identified, 30 studies focused on the effectiveness of simulation-based education and nine studies evaluated the validity of simulation-based assessment. Thirteen studies (30%) targeted the lower levels of Kirkpatrick's hierarchy with reliance on self-reporting. Simulation was unanimously described as a positive learning experience with perceived impact on clinical practice. Of the 17 remaining studies, 10 used a single group or "no intervention comparison group" design. The majority (n = 17; 44%) were able to demonstrate both immediate and sustained improvements in educational outcomes. Nine studies reported the psychometric properties of simulation-based performance assessment as their sole objective. These predominantly recruited independent practitioners as a convenience sample to establish whether the tool could discriminate between experienced and inexperienced operators and concentrated on a single aspect of validity evidence. Conclusions: Simulation is perceived as a positive learning experience with limited evidence to support improved learning. Future research should focus on the optimal modality and frequency of exposure, quality of assessment tools and on the impact of simulation-based education beyond the individuals toward improved patient care.

Publication type: Journal: Review
Source: EMBASE
Full text: Available Critical care medicine at Critical Care Medicine

25. Title: The role of simulation in teaching pediatric resuscitation: current perspectives.
Citation: Advances in medical education and practice, Jan 2015, vol. 6, p. 239-248 (2015)
Author(s): Lin, Yiqun, Cheng, Adam
Abstract: The use of simulation for teaching the knowledge, skills, and behaviors necessary for effective pediatric resuscitation has seen widespread growth and adoption across pediatric institutions. In this paper, we describe the application of simulation in pediatric resuscitation training and review the evidence for the use of simulation in neonatal resuscitation, pediatric advanced life support, procedural skills training, and crisis resource management training. We also highlight studies supporting several key instructional design elements that enhance learning, including the use of high-fidelity simulation, distributed practice, deliberate practice, feedback, and debriefing. Simulation-based training is an effective modality for teaching pediatric resuscitation concepts. Current literature has revealed some research gaps in simulation-based education, which could indicate the direction for the future of pediatric resuscitation research.
Source: Medline

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