The American Journal of Surgery (2014) 207, 165-169

The American Journal of Surgery®

Association for Surgical Education

American College of Surgeons/Association for Surgical Education medical student simulation-based surgical skills curriculum needs assessment

Charity C. Glass, M.D.[a], Robert D. Acton, M.D.[b], Patrice G. Blair, M.P.H.[c], Andre R. Campbell, M.D.[d], Ellen S. Deutsch, M.D.[e], Daniel B. Jones, M.D.[a,f,*], Kathleen R. Liscum, M.D.[g], Ajit K. Sachdeva, M.D.[c], Daniel J. Scott, M.D.[h], Stephen C. Yang, M.D.[i]

[a]Harvard Medical School, Boston, MA, USA; [b]University of Minnesota Medical School, Minneapolis, MN, USA; [c]Division of Education, American College of Surgeons, Chicago, IL, USA; [d]School of Medicine, University of California, San Francisco, San Francisco, CA, USA; [e]Children's Hospital of Philadelphia, Philadelphia, PA, USA; [f]Beth Israel Deaconess Medical Center, 330 Brookline Avenue, Boston, MA 02215, USA; [g]Baylor College of Medicine, Houston, TX, USA; [h]University of Texas Southwestern Medical Center, Dallas, TX, USA; [i]Clerkship Directors Committee, Association for Surgical Education, Springfield, IL, USA

KEYWORDS:
Simulation;
Medical education;
Medical student education

Abstract

BACKGROUND: Simulation can enhance learning effectiveness, efficiency, and patient safety and is engaging for learners.

METHODS: A survey was conducted of surgical clerkship directors nationally and medical students at 5 medical schools to rank and stratify simulation-based educational topics. Students applying to surgery were compared with others using Wilcoxon's rank-sum tests.

RESULTS: Seventy-three of 163 clerkship directors (45%) and 231 of 872 students (26.5%) completed the survey. Of students, 28.6% were applying for surgical residency training. Clerkship directors and students generally agreed on the importance and timing of specific educational topics. Clerkship directors tended to rank basic skills, such as examination skills, higher than medical students. Students ranked procedural skills, such as lumbar puncture, more highly than clerkship directors.

CONCLUSIONS: Surgery clerkship directors and 4th-year medical students agree substantially about the content of a simulation-based curriculum, although 4th-year medical students recommended that some topics be taught earlier than the clerkship directors recommended. Students planning to apply to surgical residencies did not differ significantly in their scoring from students pursuing nonsurgical specialties.

The authors declare no conflicts of interest.

This report was presented in poster form at the American College of Surgeons Clinic Congress, October 2012.

* Corresponding author. Tel.: +1-617-667-5101; fax: +1-617-667-4704.
E-mail address: djones1@bidmc.harvard.edu

Manuscript received January 4, 2013; revised manuscript June 20, 2013

0002-9610/$ - see front matter © 2014 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.amjsurg.2013.07.032

High-fidelity simulation has been credited with allowing students to practice medicine "without risk" to actual patients. This presents a somewhat unique opportunity to allow students to "care" for acutely ill patients before they are confronted with similar situations as interns, at which point real patients' lives are at stake and mistakes could have grave consequences.[1]

Students expressed high enthusiasm for simulation training. In a study at the Bonshoft School of Medicine in Ohio that looked at 90 randomized students, subjects preferred simulation to problem-based learning using a group discussion format.[2] Studies that have examined students' responses to human patient simulation have found high levels of satisfaction.[1,3–5]

Learners benefited significantly from simulation on several different outcome measures. A randomized controlled trial of 31 4th-year medical students at the University of California, Los Angeles, found that students "who learn critical assessment and management skills using full-scale, high fidelity simulation perform better than students who acquire similar skills in an interactive problem-based learning format."[6] A 2005 study demonstrated that "simulation-based rapid-response team training [in the emergency department] correlated with improved team functioning and adherence to American Heart Association guidelines in real in hospital emergencies."[7] A 2006 study by Morgan et al[8] of 299 4th-year medical students showed statistically significant improvement in written and simulation-based examination scores after participation in experiential learning.

Simulation is now a well-recognized means of assessing competency in surgical education. It is being used in various forms in the new movement in surgical education toward boot-camp courses to help prepare 4th-year medical students for surgical internships. These courses use task trainers to teach technical skills such as chest tube placement, cadavers to teach basic incisions and surgical techniques, and standardized patients to teach skills such as communication.[9] These courses have been shown to increase students' confidence before and during their internships.[10,11] Researchers at Stanford University have shown that competency measures at the beginning of the intern year for chest tube insertion and central line placement are greater for interns who participate in a surgical skills boot camp before the beginning of internship.[12] Tremendous research has been done into the appropriate elements of a simulation curriculum for 4th-year medical students, and the American College of Surgeons (ACS) and Association of Program Directors in Surgery national skills curriculum has provided a very useful template for the training of residents, but no such comprehensive, standardized, simulation-based curriculum exists for medical students in years 1 to 3.[13] The ACS and the Association for Surgical Education (ASE) are creating this curriculum for students, with planned widespread dissemination, such that educators and learners both may benefit. The curriculum focuses on basic surgical procedural and exam skills thought to be relevant to the education of medical students in years 1 to 3 pursuing any subsequent career area. The members of the ACS/ASE committee tasked with this project believe that the input and opinions of learners as well as surgery clerkship directors involved in assessing medical students are important considerations in the development of this curriculum.

The curriculum will be Web based and will be housed in the public domain, where it can be used by medical schools throughout the United States and beyond. Each module contains both information for training as well as recommendations for performance assessment. The objective of this study is to conduct a needs assessment of clerkship directors and medical students to aid in the determination of the content of a simulation curriculum for medical students in years 1 to 3, in addition to which year in medical school survey respondents thought the modules should be taught.

Methods

Questionnaire development

These 2 surveys were developed by the ACS and the ASE committee for simulation. This committee is made up of approximately 20 educators in academic surgery across the nation. These educators are clerkship directors, directors of simulation centers, and researchers in surgical education. This expert panel created a list of basic surgical and examination skills that could potentially be included in a simulation-based medical student curriculum. This list was discussed at the meetings of the ACS and ASE committee for simulation until unanimous consensus was obtained by this expert panel of surgical educators. Forty-two curricular elements were listed for potential inclusion in the final curriculum. The surveys were identical, except that medical students were additionally asked what medical schools they attended and whether they intended to apply for surgical specialties. A 5-point, Likert-type scale was used to determine respondents' opinions about whether the topic should be included in the curriculum. If a respondent answered in the affirmative, he or she was then asked to indicate in which year of medical school the topic should be incorporated. Both clerkship directors and students were given space to include any further comments they might have. Clerkship directors were surveyed in December 2010 and students in March 2011. The surveys were hosted on SurveyMonkey.com. This study was done with institutional review board approval.

Subjects and selection criteria

All surgery clerkship directors in the United States were invited via e-mail to participate in the survey via an e-mailed link. Then 4th-year medical students from 5 medical schools in different geographic regions—Harvard Medical School, the University of California, San Francisco, School