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Invited Commentary

# Surgical skills curricula in American College of Surgeons Accredited Education Institutes: An international survey

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Simulation;
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ACS-AEIs

**Abstract**

**BACKGROUND:** A clear understanding of simulation-based curricula in use at American College of Surgeons Accredited Education Institutes (ACS-AEIs) is lacking.

**METHODS:** A 25-question online survey was sent to ACS-AEIs.

**RESULTS:** The response rate approached 60%. The most frequent specialties to use the ACS-AEIs are general surgery and obstetrics/gynecology (94%). Residents are the main target population for programming/training (96%). Elements of the ACS/Association of Program Directors in Surgery Surgical Skills Curriculum are used by 77% of responding ACS-AEIs. Only 49% of ACS-AEIs implement the entire curriculum and 96% have independently developed their own surgical skills curricula. "Home-grown" simulators have been designed at 71% of ACS-AEIs. Feasibility (80%), evidence of effectiveness (67%), and cost (60%) were reasons for curriculum adoption. All programs use operative assessment tools for resident performance, and 53% use Messick's unitary framework of validity. Most programs (88%) have financial support from their academic institute. Majority of ACS-AEIs had trainees evaluate their faculty instructors (90%), and the main form of such faculty evaluation was post-course surveys (97%).

**CONCLUSION:** This study provides specific information regarding simulation-based curricula at ACS-AEIs.



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Over the past decade, general surgery postgraduate medical education has gradually but persistently shifted away from the traditional apprentice training paradigm. While the cause of this evolution is multifactorial, some of the downstream effects have included increased standardization in training, stricter oversight of work hours, and a focus on skill proficiency and assessment. Meanwhile, the breadth of medical knowledge and the range of technical skills housed beneath the umbrella of graduate surgical education continue to expand. Given these realities and the goal of graduating competent surgeons, surgical educators have recognized the need to improve the efficiency and effectiveness of training.

The use of simulation as an adjunct to training has played a large role in these ongoing curriculum reform efforts. The creation of the American College of Surgeons (ACS)/Association of Program Directors in Surgery (APDS) national skills curriculum,[1] the emphasis on simulation as an adjunct to training,[2] and the introduction of a structured assessment of operative performance have been part of a national strategy intended to meet these changing educational needs.[3] In 2005, the ACS/APDS Surgical Skills Curriculum Task Force was formed. The goal of this task force was to design a national skills curriculum to enhance the training of surgical residents, emphasizing the use of simulation-based practice to better prepare trainees for their experience in the operating room.[1] The final product of this effort, the ACS/APDS skills curriculum, was designed around the Accreditation Council for Graduate Medical Education core competencies and consists of 3 phases. Phase 1 includes 20 fundamental surgical skills modules; phase 2 includes 15 advanced surgical skills modules; and phase 3 includes 10 team-based skills modules.[4] The curriculum provides criterion-based goals designed to elevate a given resident's performance to a predetermined level of proficiency, giving residency programs an affordable, reproducible, and proficiency-based collection of surgical skills modules to use in surgical training.

In 2006, the ACS launched the ACS-Accredited Education Institutes (AEIs) program, forming a Consortium of ACS-AEIs gathered together in the interest of furthering simulation-based surgical education. The goals of the ACS-AEIs were to improve patient safety, assist practicing surgeons in meeting their requirements for Maintenance of Certification, and address the core competencies required for surgical trainees.[5] After nearly a decade of growth, 81 simulation centers across the United States, Canada, Europe, Asia, and the Middle East have successfully joined the Consortium.[6] These centers have been accredited by the ACS Division of Education according to comprehensive and focused accreditation standards for simulation-based education and training.[7]

In theory, the ACS-AEIs represent our profession's best efforts in simulation-based surgical training. They have been identified by leaders within the surgical profession as meeting high standards in the delivery of this particular type of surgical education. It is important, therefore, to understand how ACS-AEIs are in fact operationalizing the delivery of simulation-based training. As surgical education seeks to further innovate, it is important to understand what has "worked" within ACS-AEIs, and what has not. Inability to implement an innovative new simulation-based curriculum in an ACS-AEI would bode poorly for meaningful dissemination across all residency programs.

Our understanding of current practices and curricula at ACS-AEIs is presently very limited. Previous published reports of curricula and simulator use at these centers have relied heavily on survey responses from general surgery program directors. These reports have generated data regarding the size and location of the centers, their access to various simulators, and estimates of the implementation cost of the ACS/APDS Skills Curriculum.[8] No previous study has explored the simulators and simulation-based curricula currently in use or detailed institutional-specific issues and challenges across existing ACS-AEIs. The aim of this study was to collect data regarding these important characteristics of existing ACS-AEIs.

## Methods

Upon receiving Institutional Review Board approval from the University of Arizona College of Medicine, an online survey was sent to all ACS-AEIs (81 programs in 12 countries). This online survey was developed by the authors through an iterative process and included 25 multiple choice and short-answer questions, designed to capture data regarding descriptive characteristics of responding sites and detailed information related to aspects of their educational program. Specifically, the survey asked respondents to describe their learner populations, report on the presence of protected time for those learners, the types of curricula (ACS/APDS National Skills Curriculum vs other) in use, the rationale for those curricula choices, the types of instructional design in use, and the application of assessment tools. Sites were also asked to report their use of or awareness of assessment tool validation theory, the use of the site for remediation and faculty development, and types of faculty evaluation and feedback currently in place. Finally, sites reported their sources of funding for programming.

Information was collected using an electronic survey tool (Fluidsurveys.com). An initial e-mail was sent to all programs in January 2015. It included a cover letter stating the objectives of the study, an electronic link to the online questionnaire, and instructions to forward the e-mail to the most appropriate respondent at their program. Two follow-up electronic reminders were sent to the programs that did not respond in April 2015 and June 2015, to increase the response rate. The programs that did not respond to the