Improvement in American Board of Surgery In-Training Examination Performance With a Multidisciplinary Surgeon-Directed Integrated Learning Platform

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BACKGROUND: The American Board of Surgery In-Training Examination (ABSITE) is a predictor of resident performance on the general surgery–qualifying examination and plays a role in obtaining competitive fellowships. A learning management system (LMS) permits the delivery of a structured curriculum that appeals to the modern resident owing to the ease of accessibility and all-in-one organization. This study hypothesizes that trainees using a structured surgeon-directed LMS will achieve improved ABSITE scores compared with those using an unstructured approach to the examination.

STUDY DESIGN: A multidisciplinary print and digital review course with practice questions, review textbooks, weekly reading assignments, and slide and audio reviews integrated within an online LMS was made available to postgraduate year (PGY)-3 and PGY-4 residents in 2008 and 2009. Surveys were emailed requesting ABSITE scores to compare outcomes in those trainees that used the course with those who used an unstructured approach. Statistical analysis was conducted via descriptive statistics and Pearson chi-square with p < 0.05 deemed statistically significant.

RESULTS: Surveys were mailed to 508 trainees. There was an 80% (408) response rate. Residents who used structured approaches in both the years achieved the highest scores, followed by those who adopted a structured approach in PGY-4. The residents using an unstructured approach in both the years showed no significant improvement.

CONCLUSION: Residents who used a structured LMS performed significantly better than their counterparts who used an unstructured approach. A properly constructed online education curriculum has the potential to improve ABSITE scores. (J Surg 71:689-693. © 2014 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: ABSITE, learning management system, LMS, in-service scores, resident education

COMPETENCIES: Medical Knowledge, Practice-Based Learning and Improvement, Systems-Based Practice

INTRODUCTION

The American Board of Surgery In-Training Examination (ABSITE) has been implemented annually since 1975 to measure resident surgical knowledge.[1] It is an evaluation tool to objectively quantify resident familiarity with essential concepts in surgery, and hence is used by fellowship programs to gauge the competitiveness of an applicant. Furthermore, success on the ABSITE has been correlated with success on the American Board of Surgery (ABS)–qualifying examination. General surgery programs face the prospect of probation if multiple graduating residents do not pass the qualifying examination in consecutive years. Overall, the ABSITE is an important examination for both residents and general surgery programs for a variety of reasons.

Owing to the importance of this examination, a substantial amount of didactic time and financial resources are allocated toward resident education to improve outcomes on the ABSITE. Programs have implemented a variety of techniques, including didactic sessions, problem-based learning, practice questions, case-based discussions, and simulation-based training.[2,3] Although these have all proven to be successful strategies, they are inflexible as they require a fixed time away from the operating room and follow a

curriculum that is not individualized for resident postgraduate year (PGY) or rotation.[4-6] With the 80-hour workweek, residents spend less time in the hospital and mandated teaching sessions reduce time spent on clinical service and in the operating room.[7]

There is no dearth of educational resources available to general surgery residents. Practice questions can be purchased in book form or online and more than 50 ABSITE review books, applications, and courses are available.[8] The sheer volume of material available creates a hurdle for the resident in terms of how best to structure their study time and which resources to rely upon. The use of a structured curriculum that organizes quality resources to make learning more efficient and effective can be achieved through the use of a learning management system (LMS).[9]

An LMS permits the online, web-based delivery of an interactive, structured curriculum that appeals to the modern resident owing to its ease of accessibility, all-in-one organization, deployment of multimedia content, and individual progress tracking. We created an online, surgeon-led LMS portal that combined a weekly reading program with problem-based learning, a didactic series, and real-time competency assessments based on the ABS curriculum that was easily accessible to all surgery residents.

This study hypothesizes that trainees using a structured surgeon-directed LMS would achieve improved ABSITE scores compared with those who studied in an unstructured format using the various resources available to them.

METHODS

Study Design

A multidisciplinary print and digital review course with practice questions, review textbooks, weekly reading assignments, and slide and audio reviews integrated within an online LMS (Surgisphere Corporation, Durham, NC)[10] was made available to PGY-3 and PGY-4 residents from university and community general surgery training programs around the country. Residents and program directors were contacted directly between 2008 and 2009 to see whether they would be willing to participate in this study. All research residents and preliminary residents were excluded. Surveys were emailed to only residents who completed the yearlong LMS course to request their ABSITE scores to compare outcomes in those trainees who used the course to those who used an unstructured approach.

Study participants were divided into 3 groups. "Structured" learning was defined as completing all of the reading assignments, viewing all of the multimedia presentations, and completing all of the practice questions within the LMS as ascertained by program completion metrics and user logs. "Unstructured" was defined as using any self-study program that does not use commercial

review courses or resources apart from textbooks. The first group of residents used an unstructured approach for ABSITE preparation in PGY-3 and PGY-4 (no LMS). The second group of residents used an unstructured approach for ABSITE preparation in PGY-3, but signed up for the structured review program in PGY-4 (no LMS in PGY-3 and LMS in PGY-4). The third group of residents used a structured approach for ABSITE preparation in PGY-3 and PGY-4 (LMS in both PGY-3 and PGY-4). Residents were then asked to complete the survey, requesting information about their PGY-3 and PGY-4 ABSITE results, at the start of their PGY-5.

The number of residents who completed the review course was determined by the online course management system, which keeps track of resident progress with reading material and practice examination performance. The surgeon-directed learning platform, curriculum, and content were developed by faculty and residents from surgery training programs around the United States.

Course Materials

The review course includes online access to a surgery review textbook, an interactive question review program that divides 1000 general surgery board-style questions into major subject areas, slide presentations, and audio/video lectures on key topics, and a course architecture that provides immediate feedback on performance and progress. A published copy of the Clinical Review of Surgery textbook, the surgical educational printed textbook, was also provided to all participants. There was no fee to participate in this program regardless of whether the course was completed by the resident. The cost for the course for residents who did not participate in this study was $99.95 per year.

As part of this educational program, residents were asked to complete weekly reading assignments and problem-based learning modules. The format of the course followed the content outline published by the ABS on the surgery written examination.[11] Residents completed all the reading material, approximately 1000 practice questions, slide presentations on all major body systems and surgical disciplines, and reviewed audio/video lectures.

Survey Instrument

An online survey was sent to all participants in the study (Table 1).

Statistics

Data were deidentified and placed into a Microsoft Excel spreadsheet. Summary statistics and subgroup analysis by year of clinical training was completed. Statistical analysis was conducted via descriptive statistics and the Pearson chi-square with $p < 0.05$ deemed statistically significant.