Curricular Innovation in the Surgery Clerkship: Can Assessment Methods Influence Development of Critical Thinking and Clinical Skills?

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OBJECTIVE: Although key clinical skills have been defined in the Core Entrustable Professional Activities, there is a need to improve medical school curricula with standardized training opportunities and assessments of these skills. Thus, we aimed to develop an innovative curriculum that emphasized critical thinking and clinical skills. We hypothesized that we would be able to observe measurable improvement on assessments of students’ critical thinking and clinical skills after the implementation of the new curriculum.

DESIGN: Prospective, Quasi-Experimental study with the use of historical controls.

SETTING: This study took place through the third-year surgical clerkship at the University of Texas Medical Branch at the Galveston, Houston, and Austin, Texas, locations.

PARTICIPANTS: A total of 214 students taking the third-year surgical clerkship for the first time during the periods of interest were included.

RESULTS: Although the students with traditional curriculum improved 9.5% on a short answer exam from preclerkship to postclerkship completion, the students with new curriculum improved by 40%. Students under the new curriculum performed significantly better on the Objective Structured Clinical Exam; however, their shelf scores were lower.

CONCLUSIONS: Under this new curriculum and grading system, we demonstrated that students can be incentivized to improve critical thinking and clinical skills, but this needs to be balanced with knowledge-based incentives. (J Surg Ed)
number of ways the EPAs can be incorporated into curricula including mock pages, patient simulations that include order writing and radiographic interpretation, simulation-based technical skills training, and virtual or cadaveric anatomy training. These new implementations are promising, but further evaluation of the effectiveness of these and other curriculum changes needs to be assessed.

Traditional assessments of student performance on surgery clerkships rely heavily on the NBME shelf exam and subjective clinical assessments by faculty and residents. The shelf exam incentivizes students to focus on multiple choice test questions, which may result in prioritizing study time over going to the operating room or participating in other clinical learning opportunities. The end-of-clerkship assessments have been associated with numerous biases, and may incentivize students to be “likeable” over other priorities.

Thus, we aimed to develop an innovative curriculum that disrupted traditional behavioral incentives established by traditional grading criteria. We incorporated the EPAs and promoted critical thinking and clinical skills acquisition through the learning objectives, instructional methods and assessments. We used elements of motivation theory and positive psychology, radically straying from the traditional independent study method currently implemented at many institutions by altering grade incentives and creating an environment that guided self-learning to areas beyond basic knowledge acquisition. We hypothesized that by implementing these changes, we would be able to observe measurable improvement on assessments of students’ critical thinking and clinical skills (short answer exams and Observed Structured Clinical Examinations (OSCEs)) without seeing a decrease in knowledge based exam scores (Shelf).

TABLE 1. Entrustable Professional Activity-Based Learning Objectives

<table>
<thead>
<tr>
<th>EPA</th>
<th>Learning Objective</th>
<th>Taught</th>
<th>Practiced</th>
<th>Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2, 3</td>
<td>Gather a history and perform a physical examination, develop a prioritized differential diagnosis with a working diagnosis, recommend and interpret appropriate diagnostic tests for a real or simulated patient with the following conditions</td>
<td>Didactics, small group</td>
<td>Clinical patient care, small group, portfolio, CRI exercise</td>
<td>Small group facilitator, clinical evaluation, portfolio review, SAE, OSCE, shelf</td>
</tr>
<tr>
<td>1, 2, 12</td>
<td>Evaluate a wound, describe the wound accurately, and recommend appropriate treatment or referral</td>
<td>TBL</td>
<td>CRI exercise, wound clinic</td>
<td>OSCE, SAE</td>
</tr>
<tr>
<td>4, 5, 6</td>
<td>Given a real or simulated patient hospitalized for a surgical condition: 1) Provide documentation of rounding encounter in a SOAP note format 2) Provide a concise, accurate oral presentation of daily rounds encounter 3) Write/enter appropriate orders for the patient’s condition, either on paper or in the EMR</td>
<td>Orientation, didactics, TBL, simulation, clinical care teams</td>
<td>Clinics, in-patient care</td>
<td>Competency check-off, OSCE, SAE</td>
</tr>
<tr>
<td>7</td>
<td>Formulate a clinical question around the presentation, workup or treatment of a surgical patient, retrieve and synthesize evidence to present a clear answer to the question.</td>
<td>Orientation</td>
<td>Small group, portfolio, clinical patient care</td>
<td>Small group facilitator; clinical evaluation, portfolio review</td>
</tr>
<tr>
<td>8, 9, 11, 13</td>
<td>Contribute as a professional member of the surgical health care teams as expected for a third-year medical student</td>
<td>Orientation, clinical care teams</td>
<td>Clinics, in-patient care</td>
<td>Clinical evaluations</td>
</tr>
<tr>
<td>10</td>
<td>Recognize a patient requiring urgent or emergent care, initiate evaluation and treatment, and seek appropriate assistance</td>
<td>TBL</td>
<td>Clinical patient care, self-directed learning, Sim Lab</td>
<td>OSCE, SAE</td>
</tr>
<tr>
<td>12</td>
<td>Perform the procedures of a general physician</td>
<td>Orientation</td>
<td>Clinical patient care, Sim Lab</td>
<td>Competency check-off</td>
</tr>
</tbody>
</table>

*Additional learning objective detail omitted for brevity. Full learning objective matrix can be found in the appendix.
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