Identifying and Eliminating Deficiencies in the General Surgery Resident Core Competency Curriculum

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Importance
Although the Accreditation Council for Graduate Medical Education has defined 6 core competencies required of resident education, no consensus exists on best practices for reaching resident proficiency. Surgery programs must develop resourceful methods to incorporate learning. While patient care and medical knowledge are approached with formal didactics and traditional Halstedian educational formats, other core competencies are presumed to be learned on the job or emphasized in conferences.

Objectives
To test the hypothesis that our residents lack a foundation in several of the nonclinical core competencies and to seek to develop a formal curriculum that can be integrated into our current didactic time, with minimal effect on resident work hours and rest hours.

Design, Setting, and Participants
Anonymous Likert-type scale needs assessment survey requesting residents within a large single general surgery residency program to rate their understanding, working knowledge, or level of comfort on the following 10 topics: negotiation and conflict resolution; leadership styles; health care legislation; principles of quality delivery of care, patient safety, and performance improvement; business of medicine; clinical practice models; role of advocacy in health care policy and government; personal finance management; team building; and roles of innovation and technology in health care delivery.

Main Outcomes and Measures
Proportions of resident responses scored as positive (agree or strongly agree) or negative (disagree or strongly disagree).

Results
In total, 48 surgery residents (70%) responded to the survey. Only 3 topics (leadership styles, team building, and roles of innovation and technology in health care delivery) had greater than 70% positive responses, while 2 topics (negotiation and conflict resolution and principles of quality delivery of care, patient safety, and performance improvement) had greater than 60% positive responses. The remaining topics had less than 40% positive responses, with the least positive responses on the topics business of medicine (13% [6 of 48]) and health care legislation (19% [9 of 48]).

Conclusions and Relevance
General surgery residents in our program do not report being knowledgeable or comfortable with several areas of the nonclinical Accreditation Council for Graduate Medical Education core competencies. We developed a formal health care policy and management curriculum, with integration into preexisting protected surgical didactic time. This curriculum fulfills educational requirements, without negatively affecting resident work hours and without increased expense to the department of surgery. Future studies measuring the effect of this integrated program on resident education, knowledge, and satisfaction are warranted.
Acknowledging that the practice of medicine requires more than mastery of medical knowledge, in 1999 the Accreditation Council for Graduate Medical Education (ACGME) developed a core competency framework for integration into current residency education, with the goal of producing safe, competent physicians with a thorough understanding of a complex medical environment. Specifically, the 6 competencies defined as core components of resident education include patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice. Although residency programs were charged with the task of incorporating the nonclinical core competencies into their curriculum, no consensus exists as to how to best fulfill the requirement.

Consequently, residency programs have used multiple techniques to integrate the core competencies into the learning process. These include rigorous morbidity and mortality conferences, morning report, self-directed learning, web-based modules, and classic on-the-job Halstedian teaching. Patient care and medical knowledge are arguably the most facile to incorporate and test; didactic learning programs such as the Surgical Council on Resident Education curriculum are universally used in many residency programs, and surgical knowledge is annually tested with the American Board of Surgery In-Training Examination. However, other topics such as practice-based learning and improvement, interpersonal and communication skills, systems-based practice, and even professionalism are broad in scope and more difficult to structure into a curriculum. Surgical faculty may lack the expertise to competently teach such topics. Many programs have created an additional track for residents interested in health care policy, which frequently adds 6 months to 1 year to the resident’s term of training. Other programs have partnered with a master of public health, public policy administration, or business administration program to allow the resident to earn an additional degree during residency. We developed our curriculum following compelling recommendations of a group of resident authors, who suggested that health care policy education may best be integrated into overall surgical resident education. The integration would alleviate the need for prolonging residency training or for obtaining an additional degree. This approach would also allow all of the residents to benefit from the information shared, not just residents who would have been willing to add time to their training. We took this recommendation a step further in that the work group realized that health policy education alone was inadequate to fulfill ACGME requirements and that residents could benefit from instruction in broader topics, including leadership and management.

Our residency program uses many of the techniques described, but we hypothesized that our residents are not comfortable with several of the core competencies. An ideal solution would be the development of a formal curriculum that integrates with current didactic time, minimizing the effect on resident work hours and rest hours.

Methods

Institutional review board approval was not required for the study. Surveys were anonymous, with deidentified data. Oral informed consent was obtained from the participants, and they could decline to participate by simply not completing the survey. The health care policy and management curriculum began as an attempt to fulfill an educational requirement for the surgery residency during the course of a completely new rendering of the larger surgical education curriculum. We used established methods for curriculum development and included taxonomy terms for cognitive, affective, and psychomotor outcomes. Understanding that the course was going to be an established part of the residency program and had specific components that were compulsory, we created the foundational content of the curriculum without resident involvement. After the primary course content was established, we developed a 10-question survey in which our general surgery residents were asked to rate their understanding, working knowledge, or level of comfort on the following topics: (1) negotiation and conflict resolution; (2) leadership styles; (3) health care legislation; (4) principles of quality delivery of care, patient safety, and performance improvement; (5) business of medicine, including management principles, contract language, and insurance concepts; (6) clinical practice models; (7) role of advocacy in health care policy and government; (8) personal finance management; (9) team building; and (10) roles of innovation and technology in health care delivery (Figure 1). Responses were scored as positive (agree or strongly agree) or negative (disagree or strongly disagree). Surveys were distributed in September 2012 during grand rounds, protected didactic time for our residents, such that survey completion would be robust.

Concurrently, a work group composed of surgeons and pediatricians with MBA degrees and experience with curriculum development, as well as surgery resident representatives, met to establish a health care policy and management curriculum. The collaboration among clinical and academic faculty, department administration, and surgery residents sought to create a curriculum that fulfills ACGME requirements for resident education in professionalism, systems-based practice, interpersonal and communication skills, and practice-based learning and improvement. This was accomplished by organizing into the health care policy and management curriculum the study of policy, management, and leadership in health care, with a focus on skill sets needed for the current health care climate. The health care policy and management curriculum was presented to the department of surgery education committee for approval and implementation.

Results

The survey response rate among the residents was 70%, with 48 residents completing the survey. Responses were equally distributed among all resident levels and included categorical and noncategorical general surgery residents, as well as cat-
Knowledge Among 48 Surgery Residents

Table. Responses to Self-assessment Survey of ACGME Competency Knowledge Among 48 Surgery Residents

<table>
<thead>
<tr>
<th>Resident Understanding, Working Knowledge, or Level of Comfort</th>
<th>Positive Response, No. (%)a</th>
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<tbody>
<tr>
<td>Negotiation and conflict resolution</td>
<td>33 (69)</td>
</tr>
<tr>
<td>Leadership styles and associated strengths and weaknesses</td>
<td>35 (73)</td>
</tr>
<tr>
<td>Health care legislation and past or potential effect</td>
<td>9 (19)</td>
</tr>
<tr>
<td>Principles of quality delivery of care, patient safety, and performance improvement</td>
<td>32 (67)</td>
</tr>
<tr>
<td>Business of medicine, including management principles, contract language, and insurance concepts</td>
<td>6 (13)</td>
</tr>
<tr>
<td>Clinical practice models and their strengths and weaknesses</td>
<td>15 (31)</td>
</tr>
<tr>
<td>Role of advocacy in health care policy at state and federal government levels</td>
<td>16 (33)</td>
</tr>
<tr>
<td>Personal finance management and asset protection</td>
<td>17 (35)</td>
</tr>
<tr>
<td>Team building and management</td>
<td>36 (75)</td>
</tr>
<tr>
<td>Roles of innovation and technology in health care delivery and practice</td>
<td>35 (73)</td>
</tr>
</tbody>
</table>

Abbreviation: ACGME, Accreditation Council for Graduate Medical Education.
* Positive response defined as agree or strongly agree.

Table 1 shows responses to the self-assessment survey of ACGME competency knowledge among 48 surgery residents. The results indicate varying levels of understanding across different areas, with negotiation and conflict resolution having the highest positive response rate (69%).

Discussion

The ACGME core competencies are necessary, albeit challenging, addition to the already substantial surgery curriculum. With...
Surgery Resident Core Competency Curriculum

Figure 2. Resident Learning Objectives

1. Recognize how major health care legislation has impacted health care practice in the United States and the health of its citizens.  
2. Analyze broad legal issues in health care policy, as well as more specific practice-based potential legal pitfalls applying principles of management and ethics.  
3. Develop an appreciation of the structure and policies of US health care and understand the role of advocacy and its impact on policy in state and federal government.  
4. Apply principles of communication, negotiation, and team building.  
5. Build an appreciation of importance of health care innovation and technology and the possibilities of extending beyond basic health information storage into transformation of the entire way clinicians are trained and health care is delivered.  
7. Obtain a basic vocabulary for the business of medicine, including basic management principles, contract language, clinical practice models, and insurance concepts.  
8. Identify leadership styles with their associated strengths and weaknesses.  

The health care policy and management curriculum work group defined 9 resident learning objectives.

Figure 3. Health Care Policy and Management Curriculum

<table>
<thead>
<tr>
<th>Health Care Systems and Policy</th>
<th>Management and Clinical Practice</th>
<th>Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advocacy</td>
<td>Basic management principles</td>
<td>Personal leadership styles, their strengths and weaknesses</td>
</tr>
<tr>
<td>Medical economics and Finance</td>
<td>Quality, performance improvement, patient safety</td>
<td>Power and influence: organization psychology</td>
</tr>
<tr>
<td>History and consequences of major legislation</td>
<td>Coding and billing compliance</td>
<td>Negotiation and conflict resolution</td>
</tr>
<tr>
<td>Innovation in health care</td>
<td>Legal issues, litigation, risk management</td>
<td>Communication</td>
</tr>
<tr>
<td>Health information technology</td>
<td>Clinical practice models</td>
<td>Ethics</td>
</tr>
<tr>
<td>Comparative effectiveness</td>
<td>Contracts, relative value units (RVUs), surgical practice specifics</td>
<td>Six Sigma</td>
</tr>
<tr>
<td>Health care disparities</td>
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</tr>
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Major and minor topics.

reduction of work hours, surgery residents and faculty already perceive that residents’ technical training is at risk, with fewer operative cases,15–18 and that patient continuity and coordination of patient care will suffer.19 The addition of laparoscopic skills certification20 and endoscopy case requirements21 further reduces time for the inclusion of the core competencies. While it may be tempting and appealing to use current conferences such as morning report4 and morbidity and mortality5 as an aid for teaching these core competencies, we have found that residents perceive these current methods are insufficient to develop an adequate knowledge base or skill set.

Our goal was to develop a curriculum that would not require time from the residents’ clinical or personal schedules but would be comprehensive enough to fulfill ACGME requirements, plus create a foundation for further learning in leadership, health care management, and legislation. The inclusion of competency training into current didactic time, protected learning time for our residents, is a cornerstone of our plan and could be used by even smaller surgery programs as satisfaction surveys, should be implemented, starting with this curriculum. Ideally, precurriculum and postcurriculum testing of knowledge within each curricular element, as well as future evaluations may include pretesting the residents to determine if their perceived deficiencies matched actual lack of knowledge. A criticism of this study may be that we did not stratify the survey based on resident level; however, this would have made the response numbers too small to gain anything but anecdotal information. Future surveys with stratification will be confounded by the current existence of a focused health care policy and management education and may not provide accurate information regarding deficits in resident education. Our institution has recently hired a PhD educator (May 2013), who will be able to assist us in further development of this curriculum. Ideally, precurriculum and postcurriculum testing of knowledge within each curricular element, as well as satisfaction surveys, should be implemented, starting with our 2013 intern class and stratified by year to follow accumulation and retention of competency knowledge. Resident feedback is essential for improvement of the curriculum. Becoming an expert in any of the core competencies will require further postgraduate training. Our goal is for our residents to

use of local resources can potentially be repeated at other residency programs, even those that are within a community and not attached specifically to an academic institution. Residents and faculty enthusiastically received the novel and thought-provoking additions to the curriculum.

Although the introduction of this curriculum into our didactic learning experience has been a positive initial step in integrating nonclinical topics into surgical residency education, we recognize that more rigorous studies of its effect on resident education, knowledge, and satisfaction are a necessary function of the final step of curriculum development.23 Future evaluations may include pretesting the residents to determine if their perceived deficiencies matched actual lack of knowledge. A criticism of this study may be that we did not stratify the survey based on resident level; however, this would have made the response numbers too small to gain anything but anecdotal information. Future surveys with stratification will be confounded by the current existence of a focused health care policy and management education and may not provide accurate information regarding deficits in resident education. Our institution has recently hired a PhD educator (May 2013), who will be able to assist us in further development of this curriculum. Ideally, precurriculum and postcurriculum testing of knowledge within each curricular element, as well as satisfaction surveys, should be implemented, starting with our 2013 intern class and stratified by year to follow accumulation and retention of competency knowledge. Resident feedback is essential for improvement of the curriculum. Becoming an expert in any of the core competencies will require further postgraduate training. Our goal is for our residents to
obtain a fundamental knowledge base through this integrated longitudinal curriculum, conveying the idea that competency can be achieved without earning additional degrees or certificates.

Conclusions

We have developed a formal health care policy and management curriculum that is fully integrated into the surgical education program using existing protected didactic time for residents. This curriculum helps fulfill the ACGME core competency requirements, without affecting resident work hours or rest hours, with no requirement of additional degrees or certificates, and at no cost to the department of surgery for this enhancement to surgery resident education. This curricular addition may serve as a template for other surgical residencies to integrate educational content with minimal resident and department expenditure. Future studies measuring the effect of the program are warranted.

ARTICLE INFORMATION

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Author Contributions: Drs Tapia and Braxton had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: All authors. Acquisition, analysis, or interpretation of data: Tapia, Braxton. Drafting of the manuscript: All authors. Critical revision of the manuscript for important intellectual content: All authors. Statistical analysis: Tapia. Study supervision: Braxton.

Conflict of Interest Disclosures: None reported.

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REFERENCES


