

Resource Usage Implementing the Surgical Resident Prep Curriculum at a Single Institution

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OBJECTIVE: The Resident Prep Curriculum (RPC), published in 2014 and developed as a collaboration of the American College of Surgeons, Association of Program Directors in Surgery, and the Association for Surgical Education, was designed to improve the quality and consistency of medical student preparation for surgical residency. We aim to assess the feasibility of and resource usage for implementation of this curriculum at our institution.

DESIGN: Our institution expanded upon a pre-existing 2-week surgical preparatory course, adding modules designed to meet the goals and objectives of the RPC. We performed an evaluation of the resources required for these additions, namely time, logistics and incremental cost.

SETTING: The course took place at the Perelman School of Medicine, which is a large, academic medical center affiliated with the Hospital of the University of Pennsylvania.

RESULTS: Our course satisfied each of the six domains outlined in the RPC. In 2015, 22 students were enrolled in the course. It was run over a consecutive 4-week period in the spring of 2015, with 9 full and 9 half days. To meet the needs of the Curriculum, approximately 33 hours (38%) were spent in the classroom, 34 hours (39%) in a simulation center, and 20 hours (23%) in the anatomical laboratory. Seventy faculty-hours (from 5 disciplines) and 73 resident-hours (double-counting for cotaught modules) were required to support the course. Besides room availability, funding was required for certain aspects of the course such

as cadavers, dedicated anatomy teaching, and the costs of supplies in the simulation center. There is also a cost associated with the use of the Penn Medicine Simulation Center. Taking these into account, the total cost of implementing the curriculum amounted to \$30,627.10.

CONCLUSION: The implementation of the RPC was feasible but relied heavily upon faculty/resident time. As a result of the success of this initiative, our medical school seeks to expand the idea across multiple specialties. (J Surg Ed ■■■■-■■■. © 2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: surgery education, medical student education, ACS/ADPS resident preparatory curriculum, cost

COMPETENCIES: Patient Care, Medical Knowledge, Practice Based Learning and Improvement, Systems Based Practice, Professionalism, Interpersonal Skills and Communication

INTRODUCTION

Over the past 2 decades, the preparedness of surgical interns transitioning from medical school to residency has been called into question.¹⁻³ Moreover, differences in curricula and clinical experience in medical schools lead to variability in the skills of surgical interns when starting residency. It has been suggested that the stresses of the transition from medical school to residency could be mitigated in the fourth year of medical school, however, this is often not the case.⁴ The fourth year of medical school is frequently unstructured and may not properly prepare students for the difficult transition to residency.²

With the decline in training hours over the past 10 years along with medical student unpreparedness, an essential need to increase the efficiency of surgical training has been

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witnessed.⁵ Fourth year medical school electives designed to increase the clinical and technical competence of incoming interns have gained in popularity. These elective courses, sometimes referred to as “Capstone” courses, have been associated with increased medical student confidence, knowledge and skill going into residency.^{2,6-9}

Given the established need for preparatory courses and consistency in incoming surgical intern skill sets, the American College of Surgeons (ACS), Association of Program Directors in Surgery (APDS), and Association for Surgical Education (ASE) developed a curriculum for senior medical students entitled the Resident Prep Curriculum (RPC). Established in 2014, the curriculum aims to increase medical student preparedness for surgical residency by teaching essential knowledge-based and technical skills to matriculating surgery residents, thereby enabling program directors to have more uniform expectations of incoming interns.¹⁰ The curriculum has 6 domains based on the American College of Graduate Medical Education (ACGME) core competencies: patient care and medical knowledge, technical skills, professionalism, interpersonal skills and communication, practice-based learning and improvement and systems-based practice (www.acgme.org, accessed June 2017).

In 2015, our institution was one of a pilot of 47 institutions to implement the ACS/APDS/ASE RPC. Not surprisingly, the incorporation of such a curriculum presents several challenges including costs associated with implementation and logistics. To our knowledge, the feasibility of, as well as the resources required to implement the RPC, have not been reported. As such, the purpose of this study was to assess the feasibility of and resources required for implementation of this curriculum at our institution.

MATERIALS AND METHODS

The ACS/APDS/ASE RPC was first implemented at the Perelman School of Medicine (PSOM) as a 4-week elective course in April 2015. It should be noted that a less formal, 2-week intern prep course curriculum had been in place at our institution since 2009. The previous course was run by a faculty advisor and the students.

Skills sessions and didactic courses were targeted at each of the 6 domains of the RPC.¹⁰ The course was set across 3 different locations—namely, classrooms of the PSOM, an Advanced Anatomy Lab (AAL) and the Penn Medicine Clinical Simulation Center (PMCS). The AAL is housed within the medical school but is separate from the main anatomy laboratory used by the first-year medical students. It contains operating room instruments (deep retractors, long scissors and clamps, needle holders, vascular forceps, self-retaining retractors, etc.) and lighting. The PMCS is a 22,000 ft² facility that has dual accreditation from the ACS as a Level I Comprehensive Education Institution and from

the Society for Simulation in Healthcare. The PMCS is located off-site from the PSOM. It contains human patient simulators set in realistic inpatient wards, simulated operating rooms and task trainers for individual instruction in procedural skills.

Costs incurred were tabulated for resources associated with the curriculum including personnel, materials, facilities, and opportunity cost.¹¹ Personnel cost refers to the number of staff hours and the associated hourly wages. The material costs included the disposable supplies and cadavers used for teaching the advanced anatomy portions of the curriculum. Facility costs included the simulation center facility fee. The opportunity costs were calculated using lost clinical revenue due to interruption of the clinical practice time beyond prior teaching requirements. Of note, we did not include initial implementation capital expenses, cost of simulation equipment, or annual operational maintenance expenses. Finally, the average cost per student was calculated by dividing the overall cost by the number of students, excluding the cost for the use of the simulation center.

Data was managed using Microsoft Office Excel 2011. Given that this study does meet the regulatory definition of human research, a formal review by the IRB at the University of Pennsylvania was not required.

RESULTS

In 2015, there were 22 students enrolled in the course, all of whom completed it. The course took place over the course of 4 weeks, with 9 full days and 9 half days and consisting of a total of 87 student hours. Thirty-three hours of didactics sessions were held in classrooms in the PSOM. An additional 20 hours were spent in the AAL and the remaining 34 hours were spent on skills sessions and scenarios at the PMCS (Table 1). Table 2 demonstrates the 6 domains of the curriculum and examples of how they were met with our curriculum.

A multidisciplinary faculty of 20 were enrolled as course instructors. Representation of nursing, surgery, critical care, anesthesia, cardiology, and pharmacology was present. There were 70 faculty teaching hours which, when multiplied by the average number of faculty per hour and the average faculty salary per hour, amounted to a total cost for faculty participation of \$6,928.21. In addition, a total of 13 residents and fellows were involved in the implementation of the curriculum, which involved 73 resident-hours. When the number of residents per hour was factored in, and using the average salary of PGY-3 residents, this amounted to \$1065 in resident staff costs. There was no specific training required of the faculty and residents that were involved in the course. At this training institution, all of the surgical faculty and residents were involved in other educational and simulation activities therefore there were no additional resources used to train the educators.

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