

Brief Report

Short and Long-Term Success of a Surgery Residency Prep Course

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ABSTRACT

Introduction. This study aimed to assess the feasibility of evaluating the short-term and long-term effectiveness of a surgery residency prep course throughout the intern year.

Methods. The authors offered a surgery residency prep course to graduating medical students. We used an anonymous survey to assess the perceived confidence in medical knowledge, clinical skills and surgical skills pre-course, post-course, and at six months into residency. Participants also completed a pre- and post-course quiz.

Results. Eleven students completed the course and participated in a pre-course survey, seven completed the post-course survey, and four completed the six month survey. Students felt significantly more confident for intern year following the course compared to before the course (4.0 vs. 2.7, $p = 0.018$). There was no significant change in perceived confidence at six months compared to post-course results (4.0 vs. 3.9, $p = 0.197$). Objectively, there was a significant improvement in post-course quiz results compared to pre-course quiz results (12.9 vs. 10.6, $p = 0.004$).

Conclusions. This study demonstrates that a surgery prep course may have long-term positive effects on resident confidence when entering a surgery residency. *Kans J Med* 2023;16:321-323

INTRODUCTION

Every summer, training hospitals and medical colleges transition responsibilities and expectations to a new set of individuals. During this transitional period, interns are expected to proficiently examine patients, formulate plans, write orders, and perform life-saving bedside maneuvers. While most of these individuals will have upper-level resident or attending oversight, the oversight can be variable and may not be immediate. Certainly, this can create stressful environments for all training levels involved. Findings from a prior study show that surgical interns report feeling under-prepared to fulfill the expected responsibilities pertaining to patient care and medical knowledge.¹ Some programs have worked to ease the transition of responsibilities and instill confidence in interns through preparatory courses offered before the start of the intern year, with the goal of moderating the learning curve.² Resident confidence is multifactorial and includes personal experiences, individual skill development, and feedback,³ so it is useful to have courses that vary in what topics are included. Most courses include a variety of skills, didactics, and mock scenarios. Multiple studies have demonstrated the

feasibility and effectiveness of such preparatory courses.^{4,8} However, these studies often lack sufficient follow-up to assess any lasting effects. In the Antonoff study,⁸ course graduates were followed two months into their intern year, but were not followed past that time. Our study aimed to pilot the feasibility of assessing and comparing the short-term and long-term subjective and objective effectiveness of a residency prep course on surgical interns throughout a significant portion of their intern year.

METHODS

Our study involved assessing course participants' perceived confidence prior to, immediately following, and six months after completing a two-week surgery residency prep course. Participants in the elective course were graduating fourth-year medical students entering a surgical or surgery-related specialty. The course finished in May 2021 and the students' residencies began in July 2021. The course was designed based on the curriculum provided by the American College of Surgeons (ACS), Association of Program Directors in Surgery (APDS), and the Association for Surgical Education (ASE) Resident Prep Curriculum, with additional modifications to align with the specific resources available at our institution. The two-week course had three main categories of content: clinical skills, medical knowledge, and surgical skills. The study participants also completed a pre-course test and a post-course test over material covered in the course.

Using a multidisciplinary approach, course instructors came from various hospital training backgrounds and included pharmacists, respiratory therapists, surgical technologists, wound care nurses, anesthesiologists, surgical residents, and surgical attendings. Researchers organized the course content following the model established by Winter et al.⁴, delivering didactic lectures for clinical skills and medical knowledge topics, and providing hands-on workshops in either a surgical skills lab or simulation center for the surgical skills components.

The Ascension Via Christi Hospitals Wichita IRB and University of Kansas Medical Center IRB approved the study before its commencement. Participating students enrolled in the Spring 2021 course received a "Pre-Course Survey" to list three topics of most interest and three topics of least confidence. Students were then asked to use the Likert scale (1 = poor, 2 = fair, 3 = okay, 4 = good, 5 = very good) to rank their confidence in 16 different areas. Participants completed a pre-test which consisted of 15 multiple-choice questions related to surgical knowledge (see Appendix; appendix is available online at journals.ku.edu/kjm). A post-test with the same 15 multiple-choice questions was administered upon completion of the course. In December 2021, six months into residency, a similar, "Six-Month Follow-Up Survey" was sent to study participants. This final survey asked the same Likert-scale questions regarding confidence level in each of the 16 areas previously assessed.

Data Analysis. Investigators evaluated changes in confidence levels among study participants using a Wilcoxon signed-rank test, with individual assessments conducted for each area within surgical skills, medical knowledge, and clinical skills. Indexes were created to assess the pre-, post-, and six-month course survey confidence level within each category. Pre- and post-test scores were compared as means. All analyses were conducted using SPSS release 19.0 (IBM Corp., Armonk, NY).

RESULTS

Study participants (N = 11) reported three areas of most interest and least confidence in a pre-course survey. All 11 participants completed the pre-course survey. The two most frequently noted areas of interest were “line access” and “chest tube insertion.” The two most reported areas of least confidence were writing orders and ventilator management.

We had 7 of 11 participants complete the post-course survey (63.6% response rate). Nearly every category that measured the participants perceived confidence improved by the end of the course (Table 1). Overall, mean confidence score rose from 2.7 to 4.0 (p = 0.018). Table 2 breaks down reported confidence scores in each course category and demonstrates that participants gained far more confidence in their clinical skills and procedural based skills compared to their medical knowledge. Significant improvement in confidence scores was seen in all three clinical skills areas, and in six of eight of the surgical skills areas. There was significant improvement in only two of five of the medical knowledge skills. Not only did perceived confidence improve, but overall competence also increased, as measured with a pre- and post-test of surgical knowledge. Pre-test scores averaged 71% correct, while post-test scores averaged 86% correct (p = 0.004).

Table 1. Wilcoxon signed-rank test of pre- and post-course surveys.

Survey	N	Mean	Std. Deviation	Min.	Max.
Pre-course	11	2.7	0.4	2.1	3.3
Post-course	7	4.0	0.6	3.0	4.6

Z = -2.366, p = 0.018.

Table 2. Wilcoxon signed-rank test comparison of pre- and post-course surveys per category (N = 7).

Category	Pre-Course Mean (SD)	Post-Course Mean (SD)	P value
Clinical skills			
Dictating	2.6 ± 1.0	3.4 ± 0.5	0.045
Writing orders	2.1 ± 0.7	4.0 ± 0.6	0.007
Answering pages	2.1 ± 0.7	4.0 ± 0.6	0.002
Medical knowledge			
Pharmacy: Anticoagulants/reversal	3.0 ± 0.6	3.4 ± 0.8	0.200
Pharmacy: Pressors and sedation	2.4 ± 1.0	3.3 ± 0.8	0.143
Pharmacy: Electrolytes	3.4 ± 0.6	3.7 ± 1.0	0.457
Radiology interpretation	2.9 ± 0.9	3.7 ± 1.0	0.045
Mechanical ventilation	1.9 ± 0.7	3.3 ± 1.0	0.025
Surgical skills			
Sterile technique - Set up	4.3 ± 0.8	4.7 ± 0.8	0.289
Wound care/wound vacs	3.1 ± 0.4	3.7 ± 0.5	0.103
Punch biopsies	3.7 ± 0.5	4.7 ± 0.5	0.004
Line access	2.4 ± 1.3	4.4 ± 0.7	0.007
Chest tube insertion	2.1 ± 0.7	4.4 ± 0.7	<0.001
Suturing/knot tying	4.0 ± 0.8	4.7 ± 0.5	0.008
Endoscopy	2.1 ± 0.9	4.00 ± 1.2	0.015
Anastomoses	1.9 ± 0.9	4.1 ± 0.9	<0.001

The six-month follow-up survey again asked participants to rate their perceived confidence. Only 4 of the 11 course participants responded (36.4% response rate). The overall mean confidence scores of the respondents at the six-month follow-up was compared to the post-course survey (3.9 and 4.0, respectively; p = 0.197). Table 3 reflects the confidence scores individuals had at post-course and at six months follow-up. Confidence levels were remarkably similar between the two groups.

Table 3. Wilcoxon signed-rank test comparison of post-course and six-month follow-up surveys per category (N = 7).

Category	Post-Course Mean (SD)	Six-Month Follow-Up Mean (SD)	P value
Clinical skills			
Dictating	3.5 ± 0.6	3.8 ± 1.0	0.391
Writing orders	4.0 ± 0.0	4.5 ± 0.6	0.182
Answering pages	4.0 ± 0.0	4.8 ± 0.5	0.058
Medical knowledge			
Pharmacy: Anticoagulants/reversal	3.3 ± 1.0	3.0 ± 0.8	0.391
Pharmacy: Pressors and sedation	3.0 ± 0.8	3.0 ± 0.8	
Pharmacy: Electrolytes	4.0 ± 0.8	4.3 ± 0.5	0.391
Radiology interpretation	3.8 ± 1.3	3.8 ± 1.3	
Mechanical ventilation	3.3 ± 0.5	3.3 ± 1.3	1.000
Surgical skills			
Sterile technique - Set up	5.0 ± 0.0	4.8 ± 0.5	0.391
Wound care/wound vacs	4.0 ± 0.0	4.5 ± 0.6	0.182
Punch biopsies	4.8 ± 0.5	5.0 ± 0.0	0.391
Line access	4.3 ± 0.5	3.8 ± 0.5	0.182
Chest tube insertion	4.3 ± 0.5	3.5 ± 1.0	0.215
Suturing/knot tying	4.8 ± 0.5	4.8 ± 0.5	
Endoscopy	4.0 ± 0.8	3.3 ± 0.5	0.058
Anastomoses	4.0 ± 0.8	2.5 ± 1.3	0.014

DISCUSSION

Our findings demonstrate the value of a residency prep course and its insight regarding the long-term effects of surgical skills training. While prior studies have looked at the immediate effect surgery prep courses offer,^{1,4-8} very few have evaluated outcomes at time points into their residency^{6,8} and none have followed six-months into residency. Our study provides data on the confidence retained after six months; however, it is significantly limited by its small sample size, singular year of study, lack of a control group, and poor retention of survey participants. To gain a deeper understanding of the implications of a surgery prep-course, additional studies with larger sample sizes are needed. It would also be interesting to know if these courses can provide a clinical benefit by asking upper-level residents or attendings to rate the intern’s skill level. However, we should not overlook the importance of moderating

the learning curve. It is more likely that a prep-course can demonstrate to the trainee the attainability of such skills and improve their ability to learn in the first few months of residency. These prep courses are designed to supplement a training program where skills and knowledge will be further refined.

Seven of the eleven study participants completed the post-course survey, and their overall confidence level reflected a significant increase over the duration of the course. This result aligns with previous research by Winter et al.,⁴ demonstrating that participants enhanced their overall confidence, with a median score increasing from 2.4 pre-course to 3.8 post-course. The long-term effects of a prep course were assessed with a six-month follow-up survey which again assessed the participants perceived confidence. We had poor retention of respondents with only four of the original 11 participants responding. Their perceived confidence remained stable and suggests the course may have long-term benefits. However, the retention of the perceived confidence cannot be definitively attributed to the prep course as these individuals did have an additional six months of training and were not compared to a control group.

In addition to the reported confidence, clinical knowledge showed improvement. What is not known is how well this improvement in knowledge and confidence translates to better clinical preparation during residency. Future studies should incorporate the opinions of clinical educators or residency program directors on the clinical skills of residents who attend a pre-residency surgical prep course.

While this course has been offered for several years at our institution, our study is limited to data from the 2021 course. It would be beneficial to have multiple years and far more study participants to further investigate the long-term benefits of a surgery prep course. The study also is limited by its small sample size, lack of a control group, and poor retention of survey participants.

CONCLUSIONS

Our study provides some insight on the long-term efficacy a surgery prep course may have on incoming interns. Perceived confidence appears to be retained at six months although confidence does not appear to continue growing over this time. The study objectively showed that overall knowledge increased as a result of completing a surgery prep course. However, it is still unclear how far into residency a surgery prep course can provide an educational advantage. Further studies using larger sample sizes with the addition of a comparative measure of clinical skill are needed to definitively evaluate the long-term effects of a surgery prep course.

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