



Peer-led Surgical Clerkship Programming Support Through the General Surgery Interest Group at the Vanderbilt University School of Medicine

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OBJECTIVE: We present a systematic, sustainable, student-led model for supporting the Surgical Clerkship experience.

DESIGN: Our model includes student-led suturing and knot-tying classes, operating room tours, skills sessions, and shelf review sessions provided systematically for each of 5 Surgical Clerkship blocks in the 2017 to 2018 academic year.

SETTING: Vanderbilt University School of Medicine.

PARTICIPANTS: Vanderbilt University School of Medicine Surgical Clerkship students and senior medical student instructors.

RESULTS: Successful implementation of a peer-led support program for the Surgical Clerkship with a majority of students rating the helpfulness of both the operating room tours and the skills sessions a 4 or 5 on a Likert scale.

CONCLUSION: Our student-led model for a Surgical Clerkship support program can be successfully implemented and demonstrates positive initial indicators of effectiveness. (J Surg Ed 76:1451–1455. © 2019 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: surgical clerkship, peer teaching, student-led

COMPETENCIES: Practice-Based Learning & Improvement, Patient Care, Systems-Based Practice, Interpersonal and Communication Skills

INTRODUCTION

Peer education is a critical component of medical student education. Regulatory bodies, such as the Accreditation Council for Graduate Medical Education, have affirmed the need for trainees to enhance their teaching skills through peer-assisted learning (PAL).^{1,9} PAL advocates state that it helps near-peer teachers consolidate knowledge and skills,^{2,3,6,8} become more effective communicators,¹⁰ and eases the transition from student to clinician.^{9,11} Systemic benefits include a decreased burden on faculty instructors^{1-3,6} and an additional level of educational support for learners.^{2-4,7} Medical student learners have also reported more meaningful learning experiences and increased comfort in the learning environment.^{4,5,7,11} Surgical skills training is 1 domain in which PAL has been shown to be particularly successful.^{1,2,5,12} Here, we describe a systematic, sustainable, student-led model, designed by the Vanderbilt University School of Medicine's (VUSM) General Surgery Interest Group (GSIG) leadership, for supporting the Surgical Clerkship experience (Fig. 1). It is worth noting that at VUSM, students participate in clerkships during their second year. Therefore, clerkship students mentioned in this article are MS2s and upperclassmen are postclerkship MS3 and MS4s. An institution following the traditional 2 years of didactic and 2 years of clinical experience could easily modify this programming accordingly.

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FIGURE 1. Clerkship support programming: block timeline.

SURGICAL CLERKSHIP PROGRAMMING SUPPORT

Surgical Clerkship Orientation Day

Planning of the Orientation Day remains the prerogative of the Surgical Clerkship Director (CD) and staff. However, the GSIG assists with 3 key programming elements: knot tying classes, suturing classes, and operating room (OR) tours.

Longitudinal Peer Mentoring

In addition to the events detailed below, members of the GSIG leadership and several senior medical students applying into surgical residencies provide their contact information to the clerkship students on the first day of the rotation. While this is not a formalized mentoring process, clerkship students are encouraged to utilize these senior medical students as an additional resource during the clerkship. This has been well-received and we have seen this utilized for a range of questions, from surgical etiquette to the location of call rooms in the hospital.

Knot Tying and Suturing Classes

Each student is provided with a 1-hour course on knot-tying. We emphasize a 2-handed knot tying technique using the *Ethicon* knot-tying board and then advance to silk sewing thread. Each student is also provided with a 1-hour course on suturing. While suturing can be taught using cloth, fruit, or synthetic skin models, Vanderbilt clerkship students learn to close skin incisions with lightly embalmed cadavers.

To support these classes, the GSIG recruits senior medical students interested in surgery to serve as volunteer instructors. A ratio of 3 to 5 clerkship students per student instructor is effective for knot-tying practice. Similarly, a ratio of 8 clerkship students per cadaver with 1 to 2 peer instructors is effective for suturing practice. Clerkship classes contain approximately 20 students, therefore knot tying and suturing classes can be completed with approximately 4 to 6 and 2 to 3 peer instructors, respectively. Equipment is provided by the CD (Fig. 2a and b).

OR Tours

OR tours are a unique element of Vanderbilt GSIG-supported orientation that we are particularly excited to share. OR tours are peer-led experiences in which clerkship students are given time to familiarize themselves with the ORs before joining their surgical service. During this 90-minute experience, students are shown the layout of the OR floor(s) as well as the set-up of the individual OR. They are provided time to practice scrubbing, gowning, and gloving. In addition, instrument trays are

PLANNING CHECKLIST: KNOT-TYING CLASS

- Send email requesting senior peer instructors
 - 1 peer instructor per 3-5 clerkship students
- Send reminder email to volunteers one week prior
- Coordinate with Clerkship Director for:
 - Room reservation
 - Equipment:
 - Ethicon* knot-tying boards.
 - Silk sewing thread or 1-0 silk ties

PLANNING CHECKLIST: SUTURING CLASS

- Send email requesting senior peer instructors
 - 1-2 peer instructors per 8 clerkship students per cadaver
- Send reminder email to volunteers one week prior
- Coordinate with Clerkship Director for:
 - Room reservation
 - Equipment:
 - Cadaver access
 - Alternative suturing model (cloth, fruit, chicken)
 - Needle drivers
 - Pick-ups
 - Scissors
 - Suture
 - Gloves

FIGURE 2. (a) Planning checklist: knot-tying class. (b) Planning checklist: suturing classes.

available so that students may learn the names and functions of commonly used instruments. During this time, students are allowed to explore the OR, in many cases for the first time, and to ask the senior medical students leading the tour any questions that they may be hesitant to ask residents or faculty leadership.

Planning the OR tours requires advance communication and preparation, including coordination with both the CD and OR administrative staff. The OR staff provides 1 to 2 empty ORs at the end of the day. Either OR staff or the CD will provide several surgical gowns, sterile gloves, and instrument trays. Senior medical students leading the tour act as scrub-technicians to assist the clerkship students with gowning and gloving. It is important to notify all clerkship students to bring scrubs to Orientation Day, to coordinate closely with OR staff, and to comply with all OR policies during this tour experience (Fig. 3).

For the 2017 to 2018 school year, students were asked to respond to the question “How worthwhile was the tour of the OR by the GSIG?” using a Likert scale (Likert anchors: 1 = “not at all worthwhile”, 5 = “very worthwhile”). The mean Likert score from respondents ($n = 61$) was 3.94 with 71.6% of students responding with a Likert score of 4 or 5 (Table 1). Of note, these OR tours may not be necessary or may be poorly attended during the last 2 clerkship blocks, as most students will have had prior experience with the ORs by that point in the year and interest decreases.

Surgical Skills Simulation Sessions

Simulation provides an excellent opportunity for senior medical students to support the learning of clerkship students. The GSIG leadership at Vanderbilt, with the support of the CD, designed a hands-on training experience for clerkship students at the beginning of their block. The purpose of this session is to familiarize students with the techniques for commonly performed procedures before being required to assist with these procedures on service. Students rotate through four 25-minute sessions

PLANNING CHECKLIST: OR TOUR

- Email Clerkship Director for permission to contact OR administrative staff
- Email OR administration staff with:
 - Brief description of your group
 - Goal of your OR tours
 - A request for:
 - 1 – 2 empty ORs at the end of the day
 - Equipment:
 - Surgical gowns
 - Surgical gloves
 - Instrument Tray
 - Note: Equipment may also be provided by Clerkship Director
- Send email requesting senior peer instructors
 - 1-2 peer instructors per 8-10 clerkship students
- Remind clerkship students to bring scrubs to Orientation Day

FIGURE 3. Planning checklist: operating room tours.

that teach chest tube insertion, endotracheal intubation, central line placement, as well as arterial and intravenous line placement, each guided by a senior medical student volunteer instructor. In addition to teaching basic technical skills, the student instructors discuss the risks, benefits, and indications for these procedures.

Quality control of student instructors of invasive procedures is achieved by several mechanisms. First, all student instructors have received multiple iterations of instruction on these invasive procedures during their critical care, trauma, and general surgery rotations. Second, senior medical student instructors with prior experience performing these procedures offer refresher training to student instructors before, and support during, the skills sessions. Finally, an attending surgeon is always present during these sessions and continuously circulates to ensure the correct techniques are being taught.

TABLE 1. Utility of OR Tour

Academic Year	Clerkship Block	Respondents (n)	Mean Likert Scale (1-5)	Percent of Respondents Rating 4 or 5 on Likert Scale (%)
2017-2018	1	19	4.5	94
	2	16	4.3	81
	3	10	3.6	60
	4	12	4.3	73
	5	4	3	50
2018-2019*	1	15	3.9	93
	2	19	3.2	94

*Academic year to date of publication.

PLANNING CHECKLIST: SURICAL SKILLS SIMULATION

- Send email requesting senior peer instructors
 - Minimum 4 peer instructors
- Send reminder email to volunteers one week prior
 - Include video links to procedures for review
- Coordinate with Clerkship Director for:
 - Simulation lab reservation
- Coordinate with Simulation Center staff for:
 - Equipment for:
 - Chest tube insertion
 - Endotracheal intubation
 - Central line placement
 - Arterial and intravenous line placement

FIGURE 4. Planning checklist: surgical skills simulation.

At Vanderbilt, the CD schedules the time in the simulation center and our simulation staff provide the equipment. The GSIG leadership recruits volunteer instructors. Volunteer instructors are assigned teaching topics in advance and provided with a brief video link to review each topic. During the event itself, GSIG leaders are responsible for orienting instructors to their area, ensuring that all equipment is in place, and coordinating timing (Fig. 4).

For the 2017 to 2018 school year, students were asked to respond to the question “How worthwhile was the Surgical Skills session?” on a Likert scale (Likert anchors: 1 = “not at all worthwhile”, 5 = “very worthwhile”). The mean Likert score from respondents ($n = 91$) was 4.42 with 91% of students responding with a Likert score of 4 or 5 (Table 2).

Shelf Exam Review Session

GSIG leadership organizes a review session for the Surgery Shelf Exam for each clerkship block. We utilized the free Kahoot website (<https://kahoot.com/>) to design an interactive, competitive, multiple-choice review

game. The General Surgery Residency Program, the Surgical Clerkship, and the GSIG all contribute portions of their budget to provide pizza for this session’s attendees. After each review session, GSIG leadership reaches out to the CD, all medical student instructors, and to the clerkship students for feedback to ensure continuous improvement of review session quality (Fig. 5).

Transition Plan

The GSIG leadership created a detailed transition manual to inform their successors and to ensure that GSIG leadership transitions do not negatively impact programming for the following year. We suggest that students interested in implementing this programming create a similar document to ensure sustainability. The corresponding author would be happy to provide a template upon request.

RESOURCES AND FUNDING

The implementation of this programming was made possible with the logistic support of the VUSM Surgical Clerkship Program and the financial support of the General Surgery Residency Program and Student Organizational Funding. The main logistic requirements were room space, equipment, and volunteer time. The primary cost incurred during the implementation of this programming was food and drinks for the review session. This cost was split between the annual GSIG budget and the General Surgery Residency Program. We suggest that students interested in implementing this programming contact their Surgical CD, their General Surgery Residency Program Director, and their Student Organization leadership to coordinate funding. However, this curriculum can be implemented with very minimal financial input and there are low-cost options for every component of this program which the authors would be happy to suggest upon request.

TABLE 2. Utility of Surgical Skills Simulation

Academic Year	Clerkship Block	Respondents (n)	Mean Likert Scale (1-5)	Percent of Respondents Rating 4 or 5 on Likert Scale (%)
2017-2018	1	19	4.4	89
	2	16	4.6	93
	3	20	4	75
	4	19	4.3	95
	5	17	4.8	100
2018-2019*	1	18	4.7	95
	2	19	3.9	79

*Academic year to date of publication.

PLANNING CHECKLIST: SURGICAL SHELF REVIEW

- Send email requesting 1-2 senior peer instructors
- Send reminder email to volunteers one week prior
- Create Katoof™ review game
 - Send to Clerkship Director for review and approval
 - Send to instructors in advance
- Coordinate funding sources for review game refreshments
- Send feedback forms to instructors and clerkship students

FIGURE 5. Planning checklist: shelf review session.

CONCLUSION

We present systematic, sustainable, student-led model for supporting the Surgical Clerkship experience that is repeated for each of 5 clerkship blocks during the academic year. This ensures that every clerkship student receives consistent and reliable peer-support during their time on the Surgical Clerkship.

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SUPPLEMENTARY INFORMATION

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