Talking About Ethical Issues in Surgery—Results of a Novel Online Pilot Curriculum

Michael F. Amendola, MD, MEHP, FSVS, FACS,[*,†] Gundula Bosch, PhD, MEHP,[‡] and Brian Kaplan, MD, FACS[*,†]

[*]Virginia Commonwealth University Health System, Richmond, Virginia; [†]Virginia Commonwealth University School of Medicine, Richmond, Virginia; and [‡]Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland

OBJECTIVES: Surgical ethics has been suggested as a distinct field of study apart from clinical ethics due to a unique practice type and treatment dynamic. At our institution, most if not all teaching of clinical ethics is undertaken by nonsurgical faculty. We introduced a novel online Surgical Ethics Program (SEO) in a pilot form (SEO-P) for initial presentation to learners in our environment. The overall goal of our educational intervention was to enhance knowledge, understanding and appreciation for surgical ethics in medical students and to evaluate our curriculum.

SETTING: SEO-P was undertaken over a 4-week period in 2018 with 9 fourth-year medical students enrolled in a surgery elective at our institution. These learners all had career plans in general surgery or a surgical subspecialty. There was 3 weeks of content: (1) background in clinical ethics as it applies to surgical practice, (2) surgical consents and autonomy, and (3) the impaired physician. All pilot learners were evaluated with: (1) postprogram final exam assessment (compared to preprogram knowledge base test), (2) self-reflection essay of ethical practice in surgery, (3) evaluation of 2 case studies, and (4) an assessment of participation in online discussion forums. Postprogram survey of the learners was also undertaken in an anonymous fashion.

RESULTS: Four of 9 or 44.4% of students scored greater than or equal to 80% on the postprogram knowledge assessment test. A preprogram knowledge-based examination of all learners yielded a mean and standard deviation of 57.1 ± 6.0%. Postprogram knowledge-based test with mean and standard deviation was 78.8 ± 15%. This was a statistically significant increase in scores ($p = 0.004$; *t* test). All 9 passed the course with a mean final summative course grade of 95.2 ± 3.2%. From the postprogram evaluation survey, all 7 students who responded felt that the SEO-P would help them become an "ethical" practitioner. Surprisingly, only half of the learners (57.1%) thought "technology used to support the SEO Course (i.e., the chosen curriculum management system) was effective in conducting the course."

CONCLUSIONS: We set forth to use "web-based" technology to enhance exposure of medical students in our institution to surgical ethics. Hence, we designed our pilot curriculum to be a completely online offering. We feel that the utilization of the surgical voice, that is a surgical ethics curriculum developed by surgeons to explore surgically related clinical ethical issues, is an essential theme and goal of our program. Future challenges will be to present this voice in an effective manner with either an improved curriculum delivery system or by potentially utilizing a blended approach. (J Surg Ed 76:1562–1568. Published by Elsevier Inc. on behalf of Association of Program Directors in Surgery.)

KEY WORDS: clinical ethics, curriculum development, surgical ethics, online education

COMPETENCIES: Professionalism, Medical Knowledge, Interpersonal and Communication Skills

INTRODUCTION

The practice of medicine and surgery are both endeavors that involve a diversity of clinical ethical decision-making. Patients with illness are at times vulnerable and often have invasive interventions to help them heal. These procedures, when addressed in surgery, create a potential conflict dynamic.[1]

Medical ethics emerged in the 1970s as a priority within health care institutions and among educators.[2] The traditional educational goals of medical ethics have

Correspondence: Inquiries to Michael F. Amendola, MD, MEHP, FSVS, FACS, Virginia Commonwealth University School of Medicine, 416 Portwest Terrace, Richmond, VA 23238.; e-mail: mikeamen1972@gmail.com

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focused on 2 overarching concepts: (1) teaching ethics to create a virtuous physician and (2) teaching ethics by providing physicians with a skill set for analyzing and resolving ethical dilemmas. These goals have been termed the virtue/skill dichotomy approach in medical ethics.[3]

Surgical ethics has been suggested as a distinct field of study from clinical ethics.[4] This is primarily due to the unique practice type and treatment dynamic that surgical approaches create. The patient cannot know what the surgeon knows nor can she know herself like that of the surgeon who has operated on her.[5] The patient with an illness needing surgical intervention balanced with the power and mystique of the surgeon who operates upon him, produces potential ethical conflicts. This dynamic milieu creates a "sui generis" of the patient-surgeon relationship.[5]

Surgical endeavors themselves are undertaken by individual surgeons who have the ultimate responsibility for a patient's outcome that is directly linked to the success of a treatment and in the minority of times the inadvertent harm of the patient.[5] As pointed out in ethnography study, surgical training "... is above all things an ethical training."[6] The surgical profession, like other professions, has a consensus of what is considered "acceptable ethical practice."[5] This is often taught in an implicit fashion with no dedicated curriculum that addresses the most impressionable and novice of learners, the undergraduate medical student.

The Association of American Medical Colleges (AAMC) has defined educational goals for those students entering US medical schools to "behave in an honest and ethical manner ... adhere to ethical principles ... resist peer pressure to engage in unethical behavior and encourage(s) others to behave in honest and ethical way (s) ... [and] develop(s) and demonstrate(s) ethical and moral reasoning."[7] AAMC has further formalized this charge to US medical colleges to create undergraduate medical curriculums that have the "knowledge of the theories and principles that govern ethical decision making, and of the major ethical dilemmas in medicine."[8]

The practice of medicine is intrinsically an ethical enterprise with patients who are suffering with disease amid a physiological and potentially psychological vulnerability.[1] Surgeons by their very nature must balance the potential risks and benefits of intended treatments for their patients with their stated susceptibility. This creates a "unique conduct of their work in the medical community."[9] Medical treatments are not merely technical; they often invade patients' bodies and engage their consciences. Pellegrino argues that "ethical decisions are an essential part of being a good physician."[10] It has been postulated that the better a student ethical education is, the better s/he can appreciate and navigate the nuances and complexities of medical choices.[10] Educational programs to this end should be undertaken early in medical training with focused objectives within a well-designed curriculum structure to address the virtue/skill dichotomy of clinical ethics.

Despite surgeons' position in the medical community, and their practice type that inherently creates ethical conflicts, most times they have minimal representation as a stakeholder in ethics curriculum consideration, design, and implementation. Paola and Barten coined the term "Ethics Gap" when they examined the medical literature for content created by either surgeons or medical professionals.[11] Leading journals in medicine were examined and compared to those in surgery with keyword search for "ethics" and "bioethics." They found a total of 354 "ethics" articles of which only 5% were from the surgical literature. These authors rejected the possible conclusion that there are fewer "bioethical" issues in surgical practice. They asserted the more likely causes are (1) a "surgical personality," one in which paternalism dominates with less acceptance of alternative diverse points of view as well as (2) a paucity of bioethical dialogues due to a relatively lesser importance ascribed by surgeons.

Medical colleges have been charged by the AAMC to provide an "ethics curriculum" to undergraduate medical students. There have been 2 major analyses of the contemporary ethics curriculums being undertaken in medical education. DuBois and Burkemper interviewed curriculum directors of 121 medical colleges in the United States from 1999 to 2000.[1] Additionally, course syllabi were analyzed for formal ethics components. With a response rate of 72% (n = 87), the majority (about 80%) of US medical schools responded they had a formal ethics curriculum. Most of these curriculums were discussion and/or debate format with a minority (approximately 10%) consisting of "computer exercises."

Lehmann et al updated this work expanding the analysis to 125 US and Canadian medical schools.[12] This work also included surveys to curriculum directors as well as education leadership. Ethics curriculums (ethics rounds, discussion groups, and skills training) based in surgical clerkships ranked behind that of those in pediatrics, internal medicine, and obstetrics-gynecology. Strikingly, "informed consent," a common trigger of ethical conflicts in surgery, was the number one content area common in 96% of curriculums. The "lack of time in the curriculum" and the lack of "availability of qualified teachers" were the most cited obstacles found by survey. These 2 issues could potentially be resolved with an online ethics-based curriculum: materials provided in a repeated on-demand fashion with reduced faculty lectures as well as student tailoring of content engagement based on their schedule.

In examining the AAMC-registered undergraduate medical school curriculums, most US medical schools have been achieving "ethics" curriculum delivery with traditional face to face lectures.[12] Of note, no completely online ethical curriculum has been registered with the AAMC.[8] Furthermore, this database indicates that no directed undergraduate medical school curriculum exists that addresses the unique ethical challenges that surgical practices pose.

At the author's home institution, undergraduate medical students in their basic science years are introduced and exposed to the principles of clinical ethics during traditional face-to-face case-based lectures.[13] Furthermore, these efforts do not address the implications of ethical decision-making in the surgical practice setting. Once our medical students begin their surgery clinical rotations, they often have the limited perspective of ethical dynamics that might or might not be taught by surgical faculty.[13]

MATERIALS AND METHODS

The curriculum is called Surgical Ethics Online (SEO) and it was designed to address the needs of undergraduate medical students training in clinical ethics. The purpose of SEO is to increase undergraduate medical students' exposure to clinical ethics as it applies to surgical practice, in other words, "surgical ethics." It is envisioned as an online program to augment the current preclinical year face-to-face curriculum that exists. A piloted version of the SEO Program (SEO-P) was undertaken over a 4-week period (abridged syllabus Appendix A). Various educational methods were utilized for this program and are listed with stated objectives and assessments (Appendix B).

Curriculum Components

Online Didactics

A set of core lectures were offered to SEO-P learners in terms of essential fundamental knowledge of clinical and surgical ethics. *Online Discussion Forums:* Online discussion forums allowed SEO-P learners to post their responses to discussion questions. The program director monitored these posts and probed student's impressions of ethical conflicts that had arisen during their exposure to surgical practice thus far in their training. *Online Ethics Case Studies:* There were 2 individual online ethics case studies related to specific and measurable objectives (Surgical Consents & Autonomy and The Impaired Physician). In each case, there was a description of the case or a reusable learning object with focused discussion questions for the learner to respond to. *Reusable Learning Object (RLO):* There was a reusable learning object that was a scan of a fictional hand-written surgical consent form. Students critiqued this consent form and identified potential issues and conflicts that might arise during this fictional patient's planned surgical procedure. They also recommended solutions for these conflicts. *Self-Reflection on Surgical Ethics Conflicts*: The SEO-P learners had an opportunity to reflect on what it means to be an "ethical physician." They were asked in essay form to utilize a literature-based model (the "four-box model" of Wightman, & Angelos[14]) for analysis and resolution of an ethical case from their own clinical experience. This 600-word essay was evaluated at the end of the session utilizing a rubric-based assessment.

Subjects

The subjects who undertook the SEO-P were fourth-year medical students who were enrolled in a surgical elective. Final implementation of the finished curriculum will be distributed to third-year medical students during their surgical clerkship rotation starting in the Fall of 2019 pending approval from our institutional educational leadership and curriculum committee.

Goals

The goals of the SEO-P are (1) to introduce fourth-year medical students to the principles and approaches of clinical ethics as it applies to surgical practice, that is, surgical ethics, (2) to utilize a web-based curriculum to explore these concepts, (3) to utilize a collaborative online educational environment for medical students to reflect on their exposure to clinical ethics thus far in their training, and (4) to provide medical students a practical approach to ethical conflicts that they might encounter in their practice of medicine and surgery.

Objectives

The objectives for SEO-P are divided into cognitive, psychomotor, and affective domains with additional delineation as supported in the literature.[15] Each objective was linked to an educational strategy as well as an evaluation technique within a session of the pilot program. Details of the specified objectives are listed in Appendix B. Each objective was constructed to be specific, measurable, attainable, relevant, and targeted to our learners.

Learner Summative Assessments

As stated in the SEO-P syllabus (Appendix A), the post-program knowledge-based exam constituted 20% of the final course grade. The remaining 80% was equally divided in 20% increments for: a self-reflection essay, participation in a physician impairment activity,

participation in a surgical consent activity, and contribution to online discussion forums. All SEO-P learners were evaluated with a pre- and post-test design (O1 - X - O2) using online examination format (formative individual—Appendix C). Rubric-based evaluation of online surgical ethics cases as well as self-reflection essay was also part of the summative program evaluation. Several evaluation instruments and methods linked to specified objectives were utilized for the SEO-P (detailed in Appendix B).

Evaluation Questions

There were 3 main evaluation questions formulated regarding the SEO-P:

1. What percentage of SEO-P learners completed the SEO-P postprogram test online examination with a greater than or equal to 80% correct score?
2. What percentage of SEO-P learners achieved a SEO-P final course grade of greater than or equal to 90%?
3. What percentage of SEO-P learners felt the SEO-P would help them to be an "ethical" practitioner?

Postprogram Feedback Survey

All learners were offered a postprogram online anonymous survey (Appendix D). This program assessment focused on 4 general categories: *quality of course design, conceptual framework, quality of instructor's framework, and quality of course experience*. Several questions were multiple choice in nature with an additional free response section.

Future Program Iterations

wThe final and formalized SEO-P will take place during third-year medical student clerkship rotations. This final curriculum is planned for implementation in the Fall of Academic Year 2019-2020. Additional efforts including surveying preclerkship and postclerkship will be used for iterative changes to the final curriculum. Outputs from the SEO-P will also be utilized for a similar purpose.

RESULTS

Learner Summative Assessments

Four of 9 or 44.4% of students scored greater than or equal to 80% on the postprogram knowledge assessment test. A preprogram knowledge-based examination of all learners yielded a mean and standard deviation of 57.1 ± 6.0%. Postprogram knowledge-based test with mean and standard deviation was 78.8 ± 15%. This was a statistically significant increase in scores ($p = 0.004$; t test). All 9 passed the course with a mean final summative course grade of 95.2 ± 3.2%.

Pilot Program Evaluation

Completion and analysis of the SEO-P allowed us to answer the overarching evaluation questions for this first offering of the curriculum:

1. Four of 9 or 44.4% of students scored greater than or equal to 80% on the SEO-P postprogram knowledge assessment test.
2. Nine of 9 or 100% of SEO-P learners achieved a SEO-P final course grade of greater than or equal to 90%.
3. From the postprogram evaluation survey, all 7 students who completed the survey felt that the SEO-P would help them be an "ethical" practitioner.

Postprogram Feedback Survey

SEO-P learners identified several areas of strengths and weakness in our pilot curriculum. The results of the SEO-P (stated to the students as the "SEO Course," see Appendix D) anonymous survey were reviewed.

Quality of Course Design
The majority (71.4%) agreed that "the learning outcomes/objectives of the SEO Course were clearly articulated." Roughly half of learners: 57.1% strongly agreed that "The guidelines (e.g., assignments instructions and rubrics) provided to me for assignments were clear." Learners provided a mixed set of responses when asked "the methods to deliver the content of the SEO Course were effective?"—28.6% strongly agreeing, 28.6% agreeing, 28.6% neutral, and 14.3% disagreeing. Surprisingly, only half of the learners (57.1%) thought "technology used to support the SEO Course (i.e., Blackboard) was effective in conducting the course."

Conceptual Framework
In asking students after the SEO-P if they perceived themselves as: a content expert, an ethical practitioner, a diversity advocate, an evidence-based decision maker, or an applied technology integrator—all students (100%) answered that they considered themselves "an ethical practitioner." Of the 3 concepts covered in the SEO Course: principles of clinical ethics in surgical decision-making, informed surgical/procedural consent, and the impaired physician/surgeon were either strongly agreed or agreed to by 85.7%, 100%, and 85.7% of students, respectively. In free response when asked "What topics would you like to see included in this course in the future expanded form?"—one student commented *"perhaps dealing with negative feedback or how to*

handle attendings who are not able to appropriately communicate."

Quality of Instructor's Framework

All students either agreed or strongly agreed to several feedback questions about the SEO Course Director "was knowledgeable about the subject matter, communicated effectively and treated students equally." Additionally, all students rated the SEO Course Director as excellent or above average. To a lesser degree but still a majority (71.4%), either agreed or strongly agreed that the SEO Course Director "displayed culture sensitivity and was open to different viewpoints." In terms of providing timely feedback, most students (85.7%) either strongly agreed to agreed. Of note 1 student disagreed with this statement. When asked in free response form the strengths of the SEO Course, 2 students commented "he was prompt in returning our activities with comments" and "[he was] very knowledgeable and each week's outline was clearly identified along with the goals for the week." Two students provided areas of improvement to the SEO Course Director to *"give a short lecture during the orientation day ... and explain the course and how to submit documents on Blackboard."* Another student further commented on the Blackboard system *"we as a school ... have moved away from using Blackboard ... [we] use the E-Board function of ecurriculum."*

Quality of Course Experience

Overall, most students (85.7%) rated the SEO Course as average to above average with 1 student rating it as excellent. All students either agreed or strongly that "discussion forums and classmate responses were reasonable for a given week." Most of the students (71.4%) either agreed or strongly agreed that weekly readings were reasonable with 1 student disagreeing. When asked, did the SEO Course challenge them as students to produce their best work, 71.4% either agreed or strongly agreed with 1 student disagreeing. When asked about areas of improvement the theme of a desire for face-to-face course content was consistent in the comments: *"I would rather have an in-class discussion about many of these topics ... In class discussion, would be helpful ... Not a good online course ... Would be better in a classroom.*

DISCUSSION

Clinical ethics is considered an essential part of undergraduate medical school training in the United States. This has been defined by consensus as well as oversight bodies.[7,8] Most dedicated clinical ethics curricula are conducted by medical faculty. There appears to be a paucity of surgeons who are involved with these educational endeavors nationally[1,12] as well as locally in our own institution.[13]

We feel that we have achieved a successful first application of the SEO curriculum to address ethics as it applies to surgical practice. This was captured by all our pilot learners who achieved a final course grade of greater than 90% (Program Evaluation Question #2). That said, our learners displayed poor fund of knowledge as evidenced with under half of our learners achieving a scoring greater than or equal to 80% on the postprogram knowledge assessment test (Program Evaluation Question #1). On self-assessment of their performance, all learners who responded to the survey stated that the pilot program would help them be an "ethical" practitioner (Program Evaluation Question #3).

Nationally, the demands of undergraduate medical curriculums are to "fit in more with less time." The idea of an online presentation of these materials to teach surgical ethics principles was strongly advocated by the author as the "ideal" approach to this curriculum. Directed feedback by learners regarding the pilot program was surprising. A complete online treatment of the subject matter was envisioned and is stated in the actual name of the project. Most learners provided feedback to us via an anonymous survey stating that the design of the pilot program addressed the goals and objectives declared to the learner at the onset of the course. The issue at hand was the delivery of these content materials with most students responding in a neutral fashion. This was echoed by several students' free responses. It is not clear if the desire for a hybrid approach by these students was due to an inefficiency of the curriculum delivery system or a personal preference for the mode of content presentation. Alternatively, students' desire for face-to-face contact might be due to a deeper philosophical difference, and/or personal preference for the delivery method. It is our understanding that most national efforts for medical ethics teaching are presented in a traditional face-to-face offering. There seems to be a balance between offering such curriculums online for a more effective use of a limited resource (i.e., those to teach the curriculum) as well as to those receiving the content. Future iterations of the curriculum could potentially include an optional face-to-face session that would allow learners to interact with each other and the materials with a dedicated instructor.

Last, the desire for face-to-face presentation of curriculum materials might be due to failure of the program adequately engage its learners. We did not ask this directly of our learners but indirectly asking if they felt that the course director engaged them as students, of which the majority stated they felt they were engaged. Future feedback for a level of engagement for the program itself will

be elicited. Future program drafts will ask focused end of course feedback questions regarding aspects of online delivery (e.g., all things being equal, would you have liked this program to be a traditional in classroom course?).

It is not clear if the students failed to buy in to the authenticity of the online environment due to the curriculum management program or if the design of the materials were flawed? Future iterations of feedback (e.g., did you like the curriculum management system?) from the learner will address these potential nuances of the weaknesses of the program. Other issues of learners' comfort discussing these ethical issues that have or will have occurred during their training will be assessed in our planned survey of learners who have yet to start clinical rotations and/or have yet to be exposed to the SEO-P.

One of the critical issues with the finalized program will be its ability to present content that helps students (1) deal with ethical conflict and (2) be ethical providers of health care (i.e., the virtue/skill dichotomy[3]). These finalized assessments would ideally be captured by formal process objectives, educational strategy, and assessments. The closest assessment in the pilot program that we undertook was asking the question, do you think the pilot program will help you in the future? Most of the students either agreed with this statement (4 of 7 students) with only 1 student strongly agreeing. The issue of the 3 remaining students who felt neutral to this question remains a potential future expansion of assessment of the program.

Future versions of the program will include potential strategies of conflict resolution with those in the power structure of surgery who are acting "unethically" from the learner's point of view. Directly falling back on the overarching theme of "teaching ethics as a means to create a virtuous physician," the program as a whole was more directed to explicitly "teach ethics by providing physicians with a skill set for analyzing and resolving ethical dilemmas." These 2 goals are intertwined as the virtue/skill dichotomy dictates. Our learners from the earliest exposure to medical education are asking for this professional training. The program did address "physician impairment" in terms of defining the state and explaining local and national tenants that help professionals and hospitals deal with these issues. We did allow our learners to discuss their feelings regarding an impaired physician that said, we did not address the professional aspect of dealing with potential ethical conflicts our students might encounter with their newly acquired awareness and knowledge of physician impairment. This will be an expansion of our finalized program and potentially be a topic of a separate course of study for those not necessarily choosing surgery as a career path.

There are several limitations to our program. First, our program necessitated for significant support from our local institution. We anticipate future implementations of the formalized program to be labor intensive with significant buy in from a variety of key stakeholders. Our hope would be to train others with an interest in surgical ethics (e.g., fourth-year medical students like our pilot program subjects who plan on training in surgery) to help with the administration of the curriculum. Second, the selection of fourth-year medical students with career plans in surgery could potentially bias our results in terms of the desire for this type of ethical curriculum materials that center in the practice of surgery. Using our needs assessment outputs coupled with feedback from future iterations will help focus our content more broadly for our intended third-year medical student learners. Last, the materials presented each week in our pilot program were extensive in nature. We intentionally included a fair amount of materials presented with the idea of breaking down the content into other future potentially smaller more focused curriculum endeavors. Most of our learners felt the readings were reasonable for a given week that said, we did not ask about total amount of work to complete a weekly unit. Future course feedback questions will address this potential weakness.

Our hope is that by using the portability and scalability of the online portions of the curriculum, we might affect change of curriculum design nationally. Academic dissemination of our program outputs will also help affect others who are developing similar curriculum efforts for undergraduate medical students with similar goals.

CONCLUSIONS

We initially designed an educational offering that utilized a predominately online learning environment to enhance and complete medical students' exposure to surgical ethics as part of a complete medical education. We feel our curriculum addressed the needs for clinical ethics materials that centers on surgical practice. Feedback from our learners' self-assessment indicated their acceptance of the content presented to them to help them be a better ethical practitioner.

We believe the SEO-P in its final form will address the education of novice physicians in clinical ethics especially as it applies to surgical practice. We also support the utilization of the *surgical voice* that is a surgical ethics curriculum developed by surgeons to explore surgically related clinical ethical issues, as an essential theme and goal of the program. Future challenges will be to present this voice in an effective manner in the course with either an improved curriculum delivery system or by utilizing a blended live and online curriculum delivery approach. Additionally, these learners seem to be requesting a potential expansion of the content to

include how to address professionalism issues that arise and are inherent in the clinical learning environment.

Should all students receive training in surgical ethics or just those who choose surgery as a career choice? That has yet to be determined and future versions of the program could potentially involve 2 tracks—one for those medical learners who have chosen surgery as a career compared to those who have not. This latter, nondesignated surgical group could have a focused separate program, in its own right. Reporting of the outcomes of our program to our institutional educational leadership will help discern these issues and potential curriculum solutions.

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SUPPLEMENTARY INFORMATION

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