

# Broadening Our Scope: A Pilot Curriculum in Bioethics for Pathology Graduate Medical Trainees, the Emory University Experience

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## Abstract

Despite mandates from the Accreditation Council for Graduate Medical Education and American Board of Pathology, little guidance is available for educating pathology trainees on bioethics. We endeavored to describe the development and implementation of a pathology-specific pilot curriculum in bioethics for pathology trainees at Emory University. After institutional review board review and exemption, we performed a literature search on pathology and ethics, conducted an intradepartmental survey for ethics topics relevant to our trainees and faculty, and referenced the Pathology Milestones related to ethics to develop the framework and materials for the pilot curriculum. The curriculum consisted of 2 introductory and 3 topic-focused sessions over 14 months moderated by pathology faculty with interest and expertise in ethics. Sessions included a short didactic component followed by small group discussions of cases created by the investigators. Surveys were administered to participants before and 16 months after completion of the curriculum. Twenty-nine pathology trainees participated in the curriculum. In baseline surveys, 93% (27/29) of participants believed that ethical dilemmas occur in pathology practice; 62% (18/29) reported having either experienced one or more ethical dilemmas themselves or knowing a pathologist or pathology trainee who had experienced one. In postcurriculum surveys, 87% (13/15) of respondents reported having learned something new, 92% (12/13) anticipated applying this knowledge to pathology practice, and 81% (13/16) would recommend it to a pathology trainee colleague. Limitations include single institution, small sample size, and limited outcome measures for ethics education. Our curriculum may serve as a model for other pathology training programs.

## Keywords

ethics, ethics education, graduate medical education, curriculum development

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## Introduction

In 2011, the Pathology Milestone Project was developed as a collaboration between the Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Pathology (ABP) to facilitate pathology graduate medical education training programs in preparing trainees for clinical practice.<sup>1,2</sup> In 2013, the Pathology Milestones Project Working Group released 29 core milestones for 4-year anatomic pathology/clinical pathology, 28 milestones for 3-year anatomic pathology programs, and 27 milestones for 3-year clinical pathology programs. These milestones are educational

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objectives traversing cognitive, procedural, and professionalism domains deemed essential to the practice of pathology. Pathology residency programs today are expected to provide the support necessary for residents to meet these milestones throughout the training process.<sup>1,3</sup>

Several of the milestones make direct reference to tenets of bioethics and professionalism. Examples include teaching effective conflict prevention and resolution (Interpersonal and Communication Skills 1), recognizing impairment and limitations of knowledge base in self and others (Professionalism 3), and demonstrating knowledge of the ethical principles underlying error disclosure (Professionalism 1).<sup>1,2,4</sup> Unfortunately, ACGME and ABP offer little specific guidance on how to educate trainees on ethics and professionalism. Indeed, in a 2002 nationwide survey of pathology department chairs and program directors around the United States, Domen reported that almost 50% of surveyed pathology training programs provided no formal ethics and professionalism education for residents throughout the duration of training.<sup>5</sup> Further, 83.9% (26/31) of pathology department chairs and program directors considered ethical challenges to be grossly underrecognized in the pathology discipline.<sup>5</sup> In 2015, Bruns and colleagues report that in a survey of 80 chemistry laboratory directors from 24 countries, 55% reported offering no training in ethics for laboratory medicine trainees, suggesting that formal ethics training in laboratory medicine is also lacking.<sup>6</sup>

Here, we describe the development and implementation of Broadening Our Scope (BOS), a pathology-specific pilot curriculum in bioethics for pathology trainees at Emory University.

## Materials and Methods

This study was reviewed and deemed exempt by the institutional review board of Emory University (Atlanta, Georgia).

### Curriculum Development

A literature review was performed using PubMed and ScienceDirect search engines for published literature on issues related to ethics in the practice of pathology and pathology graduate medical education ethics curricula. Additional topics of relevance to pathology trainees and faculty were sought using an electronic survey of our department. A pathology ethics curriculum working group was ultimately formed consisting of a pathology resident, a pathology fellow, multiple faculty pathologists, including a dermatopathologist with a master's in bioethics, and clinical ethicists from the Emory University Center for Ethics. Referencing the Pathology Milestones from ACGME relevant to ethics, the working group used results of the literature search and survey to develop BOS, a 14-month, case-based curriculum in bioethics for pathology trainees.

### Curriculum Implementation

Five hour-long sessions were carried out over the course of 14 months (Table 1). Within the core curriculum, there was 1 introductory didactic session and 3 topic-focused, case-based sessions. An additional second introductory session was held between sessions 2 and 3 to ensure that incoming new Emory pathology graduate medical trainees were fully oriented to the goals of the curriculum. The introductory sessions consisted of a 45-minute to 1-hour length didactic presentation, depicting the necessity of ethics education for pathology trainees, core terms and concepts, and the structure and goals of the curriculum.

The case-based sessions consisted of hour-length interactive small group sessions moderated by faculty in which trainees had an opportunity to share experiences, thoughts, questions, and ideas for potential solutions to the case scenarios (Table 1). Each case-based session began with a 5-minute introduction to the topics followed by more in-depth small group discussions lasting approximately 20 minutes each for 2 case scenarios. All cases were created by the investigators and included questions to prompt small group discussion (Table 2). Small groups consisted of approximately 4 to 5 trainees each and were moderated by 1 faculty pathologists or ethicist. The final 25 minutes of the case-based sessions were reserved for reconvening the larger group and sharing ideas, remaining questions, and potential strategies for resolution.

Anonymous surveys were administered to participants before the implementation of the curriculum and 16 months after completion to assess for durable impact of the curriculum on participants. Feedback from trainee participants was also solicited after each session in written postsession surveys, and any necessary modifications to curriculum structure or content were implemented for subsequent sessions.

## Results

Over 100 published articles on various ethical issues in pathology were identified in the medical literature (Table 3). Reported ethical issues in pathology varied in subject matter and included informed consent in tissue banking and tissue ownership, postmortem examination, classifying and reporting medical errors, allocation of blood products, managing compliance in billing and coding, and the management of incidental findings in emerging molecular and genetic testing. Among 37 resident and faculty respondents to our departmental survey (response rate 35%; 37/106), 62% reported missed or incorrect diagnoses as the topic with ethical implications that they were most interested in exploring. Additional topics of interest from the survey included allocation of scarce resources, test utilization, informed consent for cytopathology services and postmortem examinations, experimental pathology, tissue ownership, and matters specific to pathology graduate medical education including trainees infectious exposure during the processing of infected tissue and high-risk autopsies.

**Table 1.** Broadening Our Scope: Curriculum Structure and Content.

Session	Structure	Topics Reviewed
Sessions 1: Introduction to ethics and pathology	45 minutes to 1 hour – Didactic given by faculty moderator using Microsoft Powerpoint	– Brief history of clinical ethics and medical education – Examples of a few ethical dilemmas in pathology and laboratory medicine – ACGME pathology milestones related to ethics – Structure of BOS
Session 2: Medical errors and pathology*	1 hour – 5 minutes: introduction to the topic – 30 minutes: small group discussions (case 1 and case 2) – 15 minutes: large group discussion (case 1 and case 2) – 10 minutes: summary of topic given by faculty moderator	– Schemes for defining and classifying medical error – Frequency of medical error – Causes and contributing factors of medical error in pathology – Patient expectations regarding medical error – Strategies for preventing and managing error in pathology – Moral distress in managing a medical error
Session 3: Test utilization in pathology*	1 hour – 5 minutes: introduction to the topic – 30 minutes: small group discussions (case 3 and case 4) – 15 minutes: large group discussion (case 3 and case 4) – 10 minutes: summary of topic given by faculty moderator	– Complexities of utilization of laboratory developed tests in anatomic and clinical laboratories – Ethical dilemmas in noninvasive prenatal testing – Schemes for defining critical laboratory values – Dilemmas in the reporting of critical laboratory values – Moral distress in test utilization in pathology
Session 4: Allocation of scarce resources in pathology	1 hour – 5 minutes: introduction to the topic – 30 minutes: small group discussions (case 5 and case 6) – 15 minutes: large group discussion (case 5 and case 6) – 10 minutes: summary of topic given by faculty moderator	– Strategies for defining “scarce/limited” resources in pathology and laboratory medicine – Ethical dilemmas in transfusion medicine – Requests for VIP treatment in pathology and laboratory medicine – Pathologists as “gatekeepers” in medicine – Moral distress in the allocation of scarce resources in pathology

Abbreviations: ACGME, Accreditation Council for Graduate Medical Education; BOS, Broadening Our Scope; VIP, very important person.

\*An additional introductory session covering content analogous to that addressed in session 1 was held between sessions 2 and 3 to provide framing and orientation for incoming new Emory pathology graduate medical trainees.

**Table 2.** Broadening Our Scope: Session 2: Medical Errors and Pathology: Case Scenario and Discussion Questions.

Case scenario:

You are a junior faculty pediatric hematopathologist at an academic medical center. You recently received outside consult slides to rule out a rare cutaneous lymphoma in a 5-year-old female. You requested the tissue block for additional studies. You received a call from the mother of the child 2 days ago asking for the results of the consult. She asks you to call her back when you have completed your evaluation. You go to laboratory customer service to check on the status of the tissue block and learn that it arrived 1 week earlier. You then speak to the histology laboratory but no one seems to know its location. You inform the referring oncologist of the situation. The clinical team expresses regret but requests that you tell the family yourself as soon as possible.

Case discussion questions:

1. Do you think that the actions described in this case include medical error(s)? Why or why not?
2. If so, what factors contributed to the occurrence of the error?
3. What role (if any) did the various parties involved play in the occurrence of the dilemma?
4. What role (if any) did the system play in the occurrence of the dilemma?
5. Was this dilemma preventable? If so how?
6. Should such an event be disclosed? If so, who is responsible for making the disclosure and to whom should information be disclosed?
7. In pathology, what are our obligations to the patient/surrogate in this case?

Topics explored during the case-based sessions in BOS included medical errors in pathology, laboratory test development and just utilization, critical value reporting, allocation of scarce resources, and ethical challenges in graduate medical education training including moral distress in the context of a

suspected medical error (Table 1). Discussion questions were customized for each case (Table 2).

Twenty-nine pathology residents and fellows participated in BOS. Residents comprised 90% (26/29) of participants, while clinical fellows made up 10% (3/29). All participants attended

**Table 3.** Select Publications in *PubMed* and *ScienceDirect* Involving Ethics and Pathology.

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- Ethical issues regarding medical error and pathology  
 Crone KG, Muraski MB, Skeel JD, Love-Gregory L, Ladenson JH, Gronowski AM. Between a rock and a hard place: disclosing medical errors. *Clin Chem.* 2006;52(9):1809-1814.  
 Dintzis SM, Clennon EK, Prouty CD, Reich LM, Elmore JG, Gallagher TH. Pathologists' perspectives on disclosing harmful pathology error. *Arch Pathol Lab Med.* 2017;141(6):841-845.  
 Cooper K. Errors and error rates in surgical pathology: an Association of Directors of Anatomic and Surgical Pathology survey. *Arch Pathol Lab Med.* 2006;130(5):607-609.  
 Perkins IU. Error disclosure in pathology and laboratory medicine: a review of the literature. *AMA J Ethics.* 2016;18(8):809-816.
- Ethical issues regarding tissue banking and pathology  
 Mascalonzi D, Dove ES, Rubinstein Y, et al. International charter of principles for sharing bio-specimens and data. *Eur J Hum Genet.* 2015;23(6):721-728.  
 Al-Hussaini M, Abu-Hmaidan A. Use of human surplus biospecimens in research: a survey from a cancer centre. *East Mediterr Health J.* 2014;20(6):378-384.  
 Reis ST, Feitosa EB, Pontes-Junior J, et al. Tumor banks: the cornerstone of basic research in urology. *Int Braz J Urol.* 2010;36(3):348-354.  
 Womack C, Gray NM. Human research tissue banks in the UK National Health Service: laws, ethics, controls and constraints. *Br J Biomed Sci.* 2000;57(3):250-253.
- Ethical issues regarding forensic pathology  
 Khiani R, Shingler S, Hasleton P. Consent for autopsy. *J R Soc Med.* 2003;96(1):53.  
 Kurosu M, Mukai T, Ohno Y. Regulations and guidelines on handling human materials obtained from medico-legal autopsy for use in research. *Leg Med (Tokyo).* 2003;5(suppl 1):S76-S78  
 Wolf DA, Drake SA, Snow FK. Ethical considerations on disclosure when medical error is discovered during medicolegal death investigation. *Am J Forensic Med Pathol.* 2017;38(4):294-297.  
 Stempsey WE. The penetrating gaze and the decline of the autopsy. *AMA J Ethics.* 2016;18(8):833-838.
- Ethical issues regarding compliance in billing and coding and pathology  
 Wiland HO IV, Grant-Kels JM. Ethical issues in dermatopathology. *Clin Dermatol.* 2012;30(5):476-481.  
 Deeken-Draisey A, Ritchie A, Yang GY, et al. Current procedural terminology coding for surgical pathology: a review and one academic center's experience with pathologist-verified coding. *Arch Pathol Lab Med.* 2018;142(12):1524-1532.
- Ethical issues regarding pathology graduate medical education  
 Bruns DE, Burtis CA, Gronowski AM, McQueen MJ, Newman A, Jonsson JJ; IFCC Task Force on Ethics. Variability of ethics education in laboratory medicine training programs: results of an international survey. *Clin Chim Acta.* 2015;442:115-118.  
 Domen RE. Ethical and professional issues in pathology: a survey of current issues and educational efforts. *Hum Pathol.* 2002;33(8):779-782.
- Additional topics  
 Sheffield V, Smith LB. Requests for VIP treatment in pathology: implications for social justice and systems-based practice. *AMA J Ethics.* 2016;18(8):786-792.  
 Wijeratne N, Benatar SR. Ethical issues in laboratory medicine. *J Clin Pathol.* 2010;63(2):97-98.  
 Sazama K. The ethics of blood management. *Vox Sang.* 2007;92(2):95-102.  
 Anderson JG. The role of ethics in information technology decisions: a case-based approach to biomedical informatics education. *Int J Med Inform.* 2004;73(2):145-150.  
 Sobel M. Ethical issues in molecular pathology. Paradigms in flux. *Arch Pathol Lab Med.* 1999;123:1076-1078.  
 Erickson LA. Incidental findings in medical imaging and genetic testing: opportunities and challenges. *Mayo Clin Proc.* 2014;89(6):715-717.  
 Amendola LM, Dorschner MO, Robertson PD, et al. Actionable exomic incidental findings in 6503 participants: challenges of variant classification. *Genome Res.* 2015;25(3):305-315.
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more than 1 session. Sixty-nine percent (20/29) completed pre-curricular surveys and 55% (16/29) completed postcurricular surveys. Twenty-four percent completed both pre- and postcurricular surveys.

On precurricular surveys, 95% (19/20) of respondents had received <2 hours of formal education in ethics during pathology training, including all of the participating graduating fourth-year residents (3/3), one of whom reported having received no ethics education in both medical school and pathology residency prior to implementation of the BOS curriculum. By contrast, 75% (15/20) of respondents reported having received more than 2 hours of formal ethics education before beginning their pathology training at Emory University; most reported more than 6 hours of formal education. Ninety-three percent (27/29) of participants believed that ethical dilemmas

did occur in pathology. More than half (52%; 15/29) reported having experienced an ethical dilemma personally and an additional 24% (7/29) were unsure if they had. Most (75%; 15/20) reported knowing a practicing pathologist who had made a medical error. In sum, 62% (18/29) reported having either experienced an ethical dilemma themselves or knowing a pathologist or pathology trainee who had experienced one.

Of the participants who completed postcurricular surveys, 87% (13/15) reported having learned something new and all found the newly acquired knowledge useful; 92% (12/13) anticipated applying this knowledge to pathology practice (Table 4). Upon completion of the curriculum, 94% (15/16) believed that a basic understanding and application of ethics and professionalism is essential to their current and future pathology practice. When asked about format, 87% of

**Table 4.** Emory Pathology Trainees Impressions of Broadening Our Scope, Impact Survey Results.

Survey Item	Proportion of Responders
Learned something new	87% (13/15)
Found newly acquired knowledge useful	100% (13/13)
Anticipated applying newly acquired knowledge to pathology practice	92% (12/13)
Believed that a basic understanding and application of ethics and professionalism is essential to their current and future pathology practice	94% (15/16)
Found the case-based format helpful	87% (13/15)
Found faculty moderators helpful	100% (15/15)
Would recommend one or more sessions to a pathology trainee colleague	81% (13/16)

participants (13/15) found the case-based format helpful and 100% (15/15) found faculty mentors helpful in the deliberation of the cases. Overall, participants preferred case-based sessions to exclusive didactic sessions. After completing the BOS curriculum, 81% (13/16) would recommend one or more sessions to a pathology trainee colleague. In postcurricular surveys, respondents were given the opportunity to express anonymous feedback regarding BOS in a free-text format. Participants underscored the importance of role modeling as an effective teaching tool in applying principles of ethics to pathology practice. They specifically expressed desires to have pathology faculty, as mentors, address existing ethical and professionalism challenges in efforts to create an environment of “honesty, integrity, and safety” for pathology trainees and patients. Another few participants recommended incorporating more details into BOS regarding pertinent laws and codes of ethics of existing professional organizations. An additional subset expressed interest in having more case-based sessions during the remainder of their pathology training.

## Discussion

Curriculum development in graduate medical education is a challenging process.<sup>7</sup> Despite our growing awareness of the value of ethics and professionalism in medicine, the optimal method of teaching ethics and professionalism to medical trainees is still largely unknown.<sup>8</sup> Over the past 15 years, there has been a surge of publications in the medical literature across a variety of disciplines proposing different models for ethics and professionalism education during residency.<sup>9-12</sup> These range from didactic guest lectures and formal courses to case-based and journal-based curricula. To address this challenge, our group elected to form a pathology ethics curriculum working group, composed of members with varied backgrounds. This group was tasked with constructing the foundations of our BOS curriculum.

Thomas and Kern report 6 key steps in curriculum development in medical education.<sup>7</sup> They are as follows: (1) problem identification and general needs assessment, (2) needs

assessment of targeted learners, (3) outlining of curriculum goals and objectives, (4) consideration of educational strategies, (5) implementation of curriculum, and (6) evaluation of educational efforts and feedback.<sup>7</sup> In the construction of our BOS curriculum, our working group attempted to address each of these steps. Our literature review and internal departmental survey represent steps 1 and 2 of this model. Our primary aim in this study was to provide a dedicated educational and professional venue for pathology trainees, under the guidance of faculty moderators, to discuss circumstances in which potential ethical conflicts may arise in the practice of pathology and laboratory medicine (step 3); secondary aims included demonstrating the practical application of the basic principles of clinical bioethics in such scenarios and equipping trainees with tools and resources to aid them in making the most ethically decisions possible in clinical practice. Given these goals, our working group deemed that case-based sessions provided the most practical format for the subject matter (step 4). Over a 14-month period, we piloted BOS (step 5) and assessed impact of our educational efforts in the form of anonymous surveys (step 6).

Within the pathology literature, parallel efforts to better understand the professionalism landscape for pathology trainees have also been undertaken. Conran, Domen, Brissette, and colleagues, for example, on behalf of the College of American Pathologists' Graduate Medical Education Committee (CAP-GMEC), have reported results of several studies exploring pathology residency program directors' and pathology residents' impressions of unprofessional behavior in pathology practice.<sup>13-15</sup> Their findings thus far have suggested that while there is agreement in the recognition and management of certain unprofessional behavior among pathology trainees and program directors, there are also notable differences between the 2 cohorts regarding these unprofessional behaviors. For example, Brissette and colleagues reported that while pathology faculty and residents agreed that posting identifiable patient information on social media and making a disparaging comment about a physician colleague or staff member in a public hospital space were both unprofessional behaviors, residents more often classified failure to respond to a pager promptly (including timely handoffs) as unprofessional than pathology faculty.<sup>15</sup> Their efforts reveal specific domains of professionalism that could be explored further in subsequent curricula on ethics and professionalism for pathology trainees.<sup>14,15</sup>

Recently, the CAP-GMEC also published a framework for a case-based module in professionalism for pathology trainees with emphasis on service, research, and education and subdivided into the areas of duty, integrity, and respect.<sup>13</sup> Shortly thereafter, Esposito and colleagues reported on Mentoring and Professionalism in Training (MAP-IT), a curriculum in professionalism for pathology trainees emphasizing professional skill-building in a supportive group process modeled after a faculty development program originally described by Branch et al.<sup>16,17</sup> Topics of focus in MAP-IT include team building, conflict resolution, giving and receiving feedback, and

strategies on balancing well-being with professional commitments and growth.<sup>16</sup>

While dilemmas related to professionalism in pathology may have ethical implications, professionalism-centered modules may not fully address the full array of ethical issues facing pathology trainees and practicing pathologists. These include topics such as managing conflicts of interest, recognizing and managing medical errors, allocation of scarce resources in pathology including blood products particularly near the end of life, and recognizing and managing moral distress in pathology trainees and practicing pathologists. To our knowledge, our study represents the first attempt at developing a formal ethics curriculum for pathology graduate medical trainees. Furthermore, as the domains for this curriculum were constructed based on solicited direct feedback from both our targeted learners and practicing anatomic and clinical pathologists, we believe BOS carries the added distinction of being relevant to pathologists both during graduate medical training and in clinical practice.

Additionally, in keeping with the positive impact findings demonstrated by Esposito and colleagues in the pathology professionalism education literature, our ethics curriculum also created an environment for interactive, peer-oriented learning, one that we too believe to be effective in skills-building.<sup>16</sup> Broadening Our Scope provided a dedicated space for pathology trainees to have open dialogue with one another and with faculty moderators regarding topics that are difficult to discuss in an environment of mutual respect and support. The carefully constructed discussion questions served to frame the scenarios for trainees with the goal of providing reasonable resolutions with strong ethical backing. Faculty moderators, who were unanimously perceived to be instrumental in discussing the cases, importantly did not dominate the discussions in the small groups; rather they served as facilitators offering experiential/anecdotal insight and answering questions as they arose within the trainee-led discussions. Thus, we believe BOS has the potential to serve as a foundation for the development of future curricula for pathology trainees that address ethical issues in pathology. Our preliminary outcomes demonstrate that pathology trainees benefit from such education. Furthermore, as participants expressed highly favorable impressions of BOS 16 months after completion of the curriculum, we believe there is durability in the impact of such a curriculum for pathology trainees.

Limitations in our efforts include the fact that BOS represents only a contemporary snapshot of ethical issues for pathology trainees. With ongoing technological advancements, continued growth of our professional business models, and evolution of our global health-care systems, it is very likely that the ethical issues practicing anatomic and clinical pathologists encounter today will continue to change over time. As such, the ideal bioethics curriculum for pathology trainees would be dynamic with the capacity to incorporate new issues practicing pathologists are facing. Along similar lines, as highlighted by Domen's survey in 2002 and Bruns international survey in 2015, to our knowledge, there have been no large-

scale studies exploring the range of ethical dilemmas practicing community and academic pathologists are facing.<sup>5,6</sup> Additionally, as our study is single institutional, it is unclear if the impact of BOS would be reproducible at every pathology training program. Similarly, as several trainees who participated in our pilot study completed their training before the end of the study, several were lost to follow-up. Consequently, only 24% of participants completed both pre- and postcurricular impact surveys, and assessment of the full scope of the preliminary impact of BOS is limited. Finally, validated outcome measures in ethics education are lacking.

In an effort to provide practical guidance to program directors based on our experience with the pilot program and associated feedback, we suggest starting a curriculum in bioethics for pathology trainees at the beginning of the academic year with only one introductory session. Ideally, this introductory session should be held within the first 2 months of the academic year to highlight ethics education as an essential component of pathology graduate medical training and physician professional development. Secondly, for case-based sessions, we recommend a short didactic introducing the topic of the cases lasting 5 minutes or less followed by 20 minutes of discussion per case. This interactive component allows trainees to engage with one another, express opinions/ideas, and advocate for a course of action in a particular case. Third, a few faculty moderators are instrumental to the sessions; moderators should be encouraged to assume the role of a facilitator in this context: steering and guiding small-group discussions without dominating or controlling trainee participation. Further, we believed that trainee participation is paramount to the success of ethics education efforts. We recommend soliciting pathology trainee feedback frequently throughout the curriculum during initial implementation to ensure relevancy. Also, inviting trainees, at the end of the year, to present and analyze cases may represent a creative opportunity for trainees to apply knowledge gained during the didactic sessions. Finally, we recommend a multidisciplinary approach whenever possible, calling upon colleagues from other divisions and medical subspecialties including providers and faculty from bioethics, law, and humanities.

Our BOS curriculum presented here represents a starting point for an ethics curriculum that attempts to meet ACGME pathology milestone requirements. Our future efforts involve generating a more comprehensive BOS curriculum that not only meets ACGME standards but is widely available and customizable for pathology graduate medical educational training programs.

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