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Doctoring Undercover: Updating the Educational Tradition of Shadowing

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Background

The practice of shadowing, in which students observe healthcare providers, has become a de facto requirement for admission to medical school [1]. Exposure to different medical settings during the premedical and undergraduate medical school years theoretically helps students decide whether medicine is a suitable profession for them and influences their choice of specialty [2–4].

Yet recent trends in premedical education suggest that the traditional approach to shadowing is due for an update. The current practice of shadowing has shortcomings. Although formal shadowing programs are intended to increase diversity in the medical profession by helping students with disadvantaged backgrounds gain exposure to the medical field, students who have academic or family connections are still more likely to access shadowing experiences, and to possess the cultural capital to know how to make the most of these experiences [1,2]. Additionally, regardless of student status, the nature, duration, and quality of shadowing experiences vary greatly across providers and institutions [5]. Most existing shadowing guidelines focus on professional standards and ethical compliance rather than pedagogical methods [6]. Educational direction is unspecific: students are simply advised to arrive at their shadowing site and take notes. While medical school admissions committees value applicants’ ability to analyze their shadowing experiences, students often have a limited theoretical or historical framework in which to contextualize their clinical observations, minimal direction about what to observe, and few opportunities to individually and collectively reflect on their observations.

By focusing on establishing the ‘suitability’ of medical school candidates and encouraging prospective medical students to specialize at an early career stage, the traditional approach to shadowing misses an opportunity to foster a richer and broader educational experience. Furthermore, since shadowing is fundamentally an exercise in human observation, the practice holds potential for hands-on instruction
in the social dimensions of medicine, which have generated increasing interest among educators and students with the launch of the behavioral science section of the Medical College Admissions Test (MCAT) in 2015.

In response to these needs, a new shadowing course and accompanying online guide (available at http://www.shadowing.healthcare/) are being developed. These resources engage students in exploring facets of medical culture so they may make more fully informed decisions about their specialty in the future. In addition to developing a course at our university, we hope the modular design of the online shadowing guide will be an inspiration for instructors in other institutional contexts and a resource for students who are shadowing outside the purview of a formal program and have had limited guidance about how to structure their experience.

Development

Background

The shadowing course Doctoring Undercover was piloted as an upper-level undergraduate elective offered by the medical school faculty through their university’s undergraduate Honors College in the spring of 2016. Enrollment was capped at 20 students. Seventeen students were interested in medicine, two were interested in physical therapy, and one was pre-pharmacy. Students represented a variety of majors, largely drawn from the basic and applied sciences; while there were no pre-requisites for the course, many students had previous extracurricular experience shadowing physicians, both locally and on medical mission trips abroad.

The shadowing sites were determined through collaboration with the directors of the medical school’s required first-year course, Introduction to Clinical Medicine (ICM), which enrolls approximately 135 medical students annually. As a component of ICM, students choose from a list of Selective Clinical Experiences (SCEs) and shadow practitioners at their chosen sites. Although some SCE sites are affiliated with the university’s medical center, sites are chosen based on their ability to expose students to the behavioral, social, and interprofessional aspects of healthcare that are the foci of the ICM course, rather than their proximity to or affiliation with the medical school. Most SCEs are intentionally distinct from traditional shadowing sites such as training programs run by medical school departments or individual physicians’ practices. For example, SCE sites include a hospital-based substance abuse services program that provides motivational interviewing for patients with substance use disorders, a home visitation health education program for at-risk pregnant women, and a multidisciplinary pain clinic.

Eleven SCE directors agreed to extend their programs to include pre-health professions students in Doctoring Undercover; before beginning their site placements, the pre-health students completed the same training and documentation required of undergraduate medical students (i.e., immunization paperwork, HIPAA compliance, and communication with site supervisors about schedules and expectations). Many behavioral science concepts covered in Doctoring Undercover are also scaffolded with the ICM course, along with verbal communication objectives and reflective writing exercises (Table 1). The premedical and medical courses will continue to inform each other as they evolve, supporting the recognized need for scaffolding premedical and medical education in the behavioral and social sciences [7].

Course goals and structure

The primary course goals were for each student to leave the class with a deeper understanding of the historical, social, and interpersonal contexts that shape contemporary healthcare and a contribution to an inquiry-based online shadowing guide for fellow pre-health professions students. A secondary goal was to use these experiences to enhance students’ applications to medical school. To achieve these goals, the course was structured in three units. The three units ‘updated’ the medical education maxim ‘See One, Do One, Teach One,’ an aphorism describing the process of moving from observation to mastery of clinical skills, by applying this approach to the social and behavioral dimensions of medicine and using new technologies to facilitate student engagement and reflection.

The first unit, ‘See One,’ was a survey of the academic literature — sociological, historical, anthropological, and bioethical — about the culture and practice of Western medicine. In this unit, students acquired a common vocabulary that enabled them to discuss how today’s medical system developed and how its culture has been studied. For example, in one class session covering ‘insider’ and ‘outsider’ (or ‘emic’ and ‘etic’) perspectives on the study of medical culture, students read anthropologist Horace Miner’s classic satire of Western medical practices, ‘Body Ritual Among the Nacirema’ [8]. In groups, they prepared similar satires that denaturalized a taken-for-granted artifact of contemporary medical culture and presented them to the class. Through this exercise, the students adopted an ‘outsider’ perspective and helped one another view familiar medical objects, such as Electronic Health Records and stethoscopes, with fresh eyes. Each week during this unit, students wrote blog post reflections integrating the assigned
readings with their experiences and career goals. Throughout the course, the instructor provided individualized analytical and editorial feedback on each post by email.

The second unit, ‘Do One,’ involved observations at selected clinical sites. Before entering the field, students received a site placement by lottery and in-class training in anthropological observational techniques. For example, in one preparatory training activity, students were taught how to map the way the built environment influenced human interaction and health behaviors. In pairs, they selected an on-campus location for an observational/interview activity, which they undertook in contexts such as mapping, that were acquired during in-class practice activities. In-class discussions of shadowing experiences enabled students to compare the organizational cultures of various medical sites, the interpersonal interactions of diverse practitioners, and the treatment of different patient populations.

### Table 1. Scaffolding of Doctoring Undercover and Introduction to Clinical Medicine (ICM) courses.

<table>
<thead>
<tr>
<th>Course Organization</th>
<th>Doctoring Undercover</th>
<th>Introduction to Clinical Medicine (ICM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Population</td>
<td>Pre-medical students (sophomores, juniors, and seniors)</td>
<td>First-year undergraduate medical students</td>
</tr>
<tr>
<td>Class Size and Format</td>
<td>~ 20 students; seminar style</td>
<td>~ 135 students, divided into small seminar sections of ~ 9 students each</td>
</tr>
<tr>
<td>Instructor</td>
<td>Single instructor</td>
<td>Two preceptors for each seminar group (one behavioral science faculty member and one clinical faculty member)</td>
</tr>
<tr>
<td>Meeting Times</td>
<td>Two meetings per week; 90 minutes each</td>
<td>1–2 meetings per week; 60–120 minutes each</td>
</tr>
<tr>
<td>Duration</td>
<td>One semester</td>
<td>1 year</td>
</tr>
<tr>
<td>Clinical Experience Requirement</td>
<td>3–4 shadowing visits to a Selective Clinical Experience site (different sites for students); two introductory observational/interview activities at adjacent health sites (same sites for entire class)</td>
<td>Three visits to a Selective Clinical Experience site; four Longitudinal Clinical Experience visits with a single physician in practice; one visit to the Salvation Army Student Clinic; one patient narrative interview</td>
</tr>
</tbody>
</table>

### Behavioral Science Topics

**Biopsychosocial factors that influence the patient/physician relationship related to:**

- **Stress and Wellness**
  - Covered
  - Covered

- **Patient Education**
  - Covered
  - Covered

- **Pain and Placebos**
  - Not Covered
  - Covered

- **Grief and Loss**
  - Covered
  - Covered

- **Nutrition and Obesity**
  - Not Covered
  - Covered

- **Addiction**
  - Covered
  - Covered

- **Health Disparities**
  - Covered
  - Covered

- **Clinical Ethics**
  - Covered
  - Covered

### Communication Objectives

- **Role modeling**
  - Observe physician/healthcare role models, with a focus on analyzing communication skills in a healthcare environment with real patients.
  - Observe and interact with physician/healthcare role models, with a focus on practicing and observing communication skills in a healthcare environment with real patients.

- **Collaboration**
  - Collaborate with students, faculty, and practitioners from other disciplines to identify and analyze the components of safe and effective patient care.
  - Collaborate with students, faculty, and practitioners from other disciplines to deliver safe and effective patient care.

- **Interviewing Skills**
  - Analyze interviewing skills in relation to one or more of the following: taking a sexual history, delivering bad news to a patient, assessing for depression/suicidality, and utilizing behavior change/motivational interviewing strategies.
  - Demonstrate advanced interviewing skills by taking a sexual history, delivering bad news to a patient, assessing for depression/suicidality, and utilizing behavior change/motivational interviewing strategies.

### Reflective Writing Exercises

- **Format**
  - Blog posts (~750 words each); course begins with instructor-provided prompts and transitions to student-generated prompts as students progress.
  - Portfolio assignments; format varies depending on assignment.

- **Frequency**
  - Weekly (mandatory)
  - Approximately weekly (students can elect to complete additional portfolio assignments to earn a higher grade).

- **Assessment**
  - Graded with a rubric; 1–2 paragraphs of individualized analytical and editorial feedback from instructor on each post
  - Graded for completion; Amount of narrative feedback at preceptor discretion.

- **Dissemination and Recognition**
  - All students select two posts for revision and open access publication on course website
  - Outstanding reflective writing by one or two students is recognized with the ICM Portfolio Award presented annually at convocation.
During the third unit, ‘Teach One,’ students formed pairs and, drawing on their experiences at their shadowing sites, composed contributions for the online shadowing activity guide. Each pair created a unique observational activity for the guide, complete with guiding questions for reflection, academic preparatory reading, and a relevant illustration. For example, one pair of students observed that a resident’s clothing choices negatively influenced the ways in which patients and colleagues viewed the authority of the resident’s medical advice. They used this observation to structure a shadowing guide activity in which students analyze the influence of providers’ dress codes on provider-patient interactions (See Table 2 for a list of student-generated activity topics). In preparing their contributions to the guide, students presented drafts of their activities to their classmates for feedback. Based upon their experiences with the assigned observational activities, the students collectively developed a rubric to evaluate their classmates’ contributions to the shadowing guide. The assessment of guide activities was student-led; the instructor averaged the classmates’ ratings and communicated the scores to the pairs of student authors, along with a synthesis of peer feedback and suggestions for revision. This iterative process prompted reflection on the specific elements that constitute a meaningful shadowing experience.

At the conclusion of the class, students refined their contributions to the guide, selected and revised their two best blog posts for final online publication, and brainstormed methods for disseminating their work in the course.

**Implementation**

The initial implementation of the pilot course appeared promising. Written qualitative responses were gathered from all 20 students (100% response rate) in answer to two open-ended questions. These responses were gathered separately from the standard satisfaction survey that the university asks students to complete upon the conclusion of each course. In response to the short-answer questions, students described 1) what they learned from the course, and 2) what advice they would give to students in future course iterations. The short-answer responses were thematically analyzed [9]. The illustrative quotes (Table 3) are representative of responses in the sample. No responses were negative in content or tone, and all 20 students indicated the course transformed their perspectives on the medical profession and their understanding of the importance of active learning in medical education [10].

In keeping with the exploratory nature of a pilot qualitative assessment [11], the overarching themes of transformative and active learning emerged from the data and were not determined a priori. For example, in describing what they learned in the course, students might have listed new terminology or practical skills. Instead, all students described changes in perspective consonant with the educational concept of learning as a transformative process that challenges...
Table 3. Thematic analysis of qualitative course feedback.

<table>
<thead>
<tr>
<th>Transformation in learning experience</th>
<th>Before the course</th>
<th>After the course</th>
<th>Sample quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) New perspectives regarding medical science disciplines and allied health fields</td>
<td><strong>Medicine is a hard science</strong></td>
<td>'I hadn’t given much thought to the ‘social’ side of medicine. As a pre-med student, most of my classes can get a bit “stuck” in the hard sciences (chemistry, bio-physics) and, frequently, seem a bit monotonous and dull.'</td>
<td><strong>Medicine is also a social science</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Medicine is a specialized practice</strong></td>
<td>'Many aspects of medicine were not apparent.'</td>
<td><strong>Medicine is a multi-disciplinary enterprise</strong></td>
</tr>
<tr>
<td>2) New techniques for improving the patient-provider relationship</td>
<td><strong>Focus on acquisition of academic knowledge</strong></td>
<td>'I was excited to get my grades up and go to med school to learn how to do everything I’ll need to know to treat my patient.'</td>
<td><strong>Awareness of the importance of the patient-provider relationship and familial context</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Focus on clinical procedures</strong></td>
<td>'When I used to shadow, the only aspect I paid attention to was the actual procedure.'</td>
<td><strong>Focus on techniques for improving patient-provider communication</strong></td>
</tr>
<tr>
<td>3) Increased awareness of psychological, social and cultural aspects of medicine</td>
<td><strong>Little or no exposure to social determinants of health</strong></td>
<td>'I had little to no actual knowledge on the social determinants of health and how these [affect medicine].’</td>
<td><strong>Awareness of the physician’s position in a larger system of social and policy determinants</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Belief that access to medical care was the sole determinant of health.</strong></td>
<td>'Before the class, most of my ideas about the shortcomings of the healthcare system were based on the lack of access of many to healthcare.'</td>
<td><strong>Awareness that healthcare access is only one determinant of health</strong></td>
</tr>
<tr>
<td>4) Acquisition of strategies for personal reflection on medical practice</td>
<td><strong>Shadowing is a passive activity</strong></td>
<td>'[I thought shadowing was] simply watching a professional and getting an idea of what a typical day is like.’</td>
<td><strong>Shadowing is a form of active learning</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Limited experience with reflective writing</strong></td>
<td>'I have only written scientific papers. I had never written anything like a blog post before.'</td>
<td><strong>Reflective writing leads to deeper personal understanding</strong></td>
</tr>
</tbody>
</table>

What advice would you give to future students in the course?

<table>
<thead>
<tr>
<th>Transformation in learning approach</th>
<th>Before the course</th>
<th>After the course</th>
<th>Sample quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Be open-minded and go ‘out of your comfort zone’</td>
<td><strong>Expectations about which shadowing sites would be most beneficial</strong></td>
<td>'I was disappointed with my shadowing site at first, but have had one of the most rewarding experiences to date!’</td>
<td><strong>Student empowerment in shaping the learning experience</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Anxiety about asking questions or speaking in class</strong></td>
<td>'Don’t be afraid to ask questions or talk to people, whether patients, classmates, or doctors.’; ’Don’t be like me and stress out about talking to the class.’</td>
<td><strong>Understanding of the role of discomfort in the learning process</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Have an open mind. You will get as much out of this course as you’re willing to put into it. Be creative. There is no opinion or idea that is wrong. Question yourself. Allow this class to help you grow.’</strong></td>
</tr>
</tbody>
</table>

(Continued)
and alters students’ self-understanding, beliefs, and/or behaviors [10]. The transformative learning experience described in students’ feedback expressed four sub-themes: 1) new perspectives regarding medical science disciplines and allied health fields, 2) new techniques for improving the patient-provider relationship, 3) increased awareness of the psychological, social, and cultural aspects of medicine, and 4) acquisition of strategies for personal reflection on medical practice.

In their coursework, the students analyzed shadowing experiences through a social science lens that goes beyond narrow observations of symptom identification and doctor-patient interaction, and places these interactions in wider social, spatial and temporal contexts. Analyzing how macro-level factors influence clinical encounters and evaluating observational activities for the online guide encouraged students’ reflection on the dynamics of an effective shadowing experience. Responses to the second question suggest that students internalized an active, self-directed approach to medical education, in which students take responsibility for shaping their learning experience rather than memorizing content in preparation for standardized tests. The types of advice respondents offered to future students expressed two themes: 1) be open-minded and go ‘out of your comfort zone’, and 2) put effort into course reflections. For some students, cultivating an active learning approach made the quality of the shadowing experiences less dependent upon the personality and specialty of site supervisors: ‘I have learned that no matter what setting you are shadowing in, there is always some valuable experience that you can take away from it and even apply to life outside the classroom,’ wrote one respondent (See Table 3 for themes and illustrative quotes).

In addition to preparing students to actively participate in future clinical training [12], it is hoped that the course will enhance students’ medical school applications. The program has been brought to the attention of the university’s medical school admissions directors, and several class sessions were devoted to assisting students with applying course experiences to their application materials. For example, students received coaching in how to discuss their shadowing experiences in mock admissions interviews, as well as guidance in incorporating elements from course blog posts into personal statements. An in-class panel of admissions committee members and officers answered student questions about the admissions process. Five students included course material in applications for the medical school admissions cycle that began immediately following the course’s conclusion. If growing cohorts of Doctoring Undercover alumni successfully apply and matriculate to the university’s medical school, increased institutional awareness of the unique preparatory experience provided by the course will be an additional benefit of the new shadowing program. Local institutional change is an essential initial step in modernizing the traditional approach to shadowing.

**Future directions**

Multiple levels of course development are planned. Locally, the class may be expanded to a larger group of premedical undergraduates at the university, perhaps by offering the course more frequently or simultaneously offering multiple course sections. The course may also serve as an experiential learning component of a more comprehensive premedical curriculum in Medical Behavioral Science, perhaps in the context of a pathway program developed in partnership with medical school faculty and admissions officers, premedical advisors, and the university’s undergraduate administrators and educators. The proposed pathway program would supplement the standard premedical curriculum with courses focused in Medical Behavioral Science and provide pathway students with tailored research mentorship in the social sciences and additional academic advising regarding medical school admissions. The addition

**Table 3. (Continued).**

<table>
<thead>
<tr>
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<th>Sample quotes</th>
<th>After the course</th>
<th>Sample quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2) Put effort into course reflections (field notes, blog posts, shadowing activities)</td>
<td>Skepticism about the value of student-directed course activities</td>
<td>‘At first I was very skeptical about writing blog posts and creating a website.’</td>
<td>Recognition of professional value of student-directed activities</td>
<td>‘Put a lot of effort into the [blog posts and shadowing guide]. These activities have shed a lot of light on what my personality is as well as given me great experiences as I pursue a medical degree.’</td>
</tr>
<tr>
<td></td>
<td>Belief that course activities other than direct shadowing experience were superfluous</td>
<td>‘Don’t rush through the [other parts] of the course because you are only interested in the hands-on shadowing. There is a great deal to be learned that will play a role in what you get out of your shadowing experiences.’</td>
<td>Belief that assignments facilitate lifelong professional identity formation</td>
<td>‘Taking really good field notes will help you in reflecting in years to come.’</td>
</tr>
</tbody>
</table>
of new shadowing sites is planned. Some Doctoring Undercover course content will also be adapted and integrated into the ICM course for medical students.

The online shadowing guide also has the potential to serve as a resource for instructors and students in other educational contexts. We are developing animated instructional videos for the guide that will cover the general shadowing procedures currently addressed in face-to-face class meetings. The videos will address logistical topics such as preparing to shadow; professional behavioral standards for shadowing; and tips for incorporating shadowing experiences into medical school application materials.

Along with the videos, the guide activities could be incorporated into courses at other institutions or into extracurricular shadowing programs. The guide will be disseminated using both traditional methods (academic presentations and publications) and new media methods (social media, blogs, list-serves) of scholarly communication. Surveys for instructor and student users of the guide will be developed, and feedback will be solicited by email and through a link on the guide website. The guide will be periodically updated to reflect new student contributions and responses to user feedback. Tools for assessing the short- and long-term impact of both the course and guide on student perspectives, medical school admissions, and overall career trajectories may be developed.

Formal study of the effectiveness of the course material will be essential to its future adoption and impact. The hypothesis that the course material promotes a transformative and active learning experience could be explored through the delivery of pre- and post-course assessments related to these constructs. It is hoped that research will be undertaken once the curriculum has reached an appropriate stage of development and the students impacted constitute an appropriate sample size for quantitative study. Future studies may include, for example, comparing the attitudes and outcomes of Doctoring Undercover students with those of students who engaged in traditional shadowing experiences, or comparing the attitudes and outcomes of students who were randomly admitted to the course versus those who were not. The development and validation of an assessment tool specifically related to premedical student shadowing would be valuable for the further assessment of this course material and for the medical education community at large.

Ideally, the dissemination and further evaluation of this course material to students, pre-health professionals counselors, shadowing supervisors, and medical educators will influence changes in the culture and practice of shadowing itself.

The course may influence change by educating students about the behavioral and social dimensions of medicine in an experiential, rather than didactic, manner; by expanding the ways in which premedical advisors and medical school admissions committee members view the purpose of shadowing; by supplying activities that encourage student engagement and foster more rewarding mentoring experiences for shadowing supervisors; and by offering an adaptable framework for structuring an educational experience whose outcomes have long been subject to personal chemistry and circumstance.

Authors’ Contributions
The author designed and taught the pilot course and wrote the article.

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No potential conflict of interest was reported by the author.

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Claire D. Clark, PhD and MPH, is an educational coordinator and assistant professor of Behavioral Science at the University of Kentucky College of Medicine.

References


