Medical Student Perceptions of Cost-Conscious Care in an Internal Medicine Clerkship: A Thematic Analysis

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BACKGROUND: Although as much as 87 % of all healthcare spending is directed by physicians, studies have demonstrated that they lack knowledge about the costs of medical care. Similarly, learners have not traditionally received instruction on cost-conscious care.

OBJECTIVE: To examine medical students' perceptions of healthcare delivery as it relates to cost consciousness

DESIGN: Retrospective qualitative analysis of medical student narratives

PARTICIPANTS: Third-year medical students during their inpatient internal medicine clerkship

MAIN MEASURES: Students completed a reflective exercise wherein they were asked to describe a scenario in which a patient experienced lack of attention to cost-conscious care, and were asked to identify solutions and barriers. We analyzed these reflections to learn more about students' awareness and perceptions regarding the practice of cost-conscious care within our medical center.

KEY RESULTS: Eighty students submitted the assignment between July and December 2012. The most common problems identified included unnecessary tests and treatments (n=69) and duplicative tests and treatments (n=20.) With regards to solutions, students described 82 scenarios, with 125 potential solutions identified. Students most commonly used discussion with the team (speak up, ask why) as the process they would use (n=28) and most often wanted to focus lab testing (n=38) as the intervention. The most common barriers to high-value care included increased time and effort (n=19), ingrained practices (n=17), and defensive medicine or fear of missing something (n=18.)

CONCLUSIONS: Even with minimal clinical experience, medical students were able to identify instances of lack of attention to cost-conscious care as well as potential solutions. Although students identified the hierarchy in healthcare teams as a potential barrier to improving high value care, most students stated they would feel comfortable engaging the team in discussion. Future efforts to empower learners at all levels to question value decisions and to develop and implement solutions may result in improved healthcare.

KEYWORDS: Medical education—systems-based practice; Medical education—qualitative analysis; Healthcare costs.

ABBREVIATIONS

ABIM American Board of Internal Medicine

ACP American College of Physicians

AAIM Alliance for Academic Internal Medicine

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INTRODUCTION

With an estimated \$700 billion of wasteful healthcare spending in the United States each year, the current state of healthcare economics is cause for concern.¹ Although as much as 87 % of all healthcare spending is directed by physicians, numerous studies have demonstrated that they lack knowledge of the costs of medical care.^{1–4} Similarly, traditional medical education programs have not provided learners instruction on cost awareness.^{4,5} Furthermore, studies have shown that the cost of medical care delivered in the context of medical education is 20 % to 60 % higher than care provided in non-teaching environments.^{6,7} Within healthcare, value is defined as the outcomes achieved per dollar spent.^{8,9} The American College of Physicians defines high-value care as care in which the health benefits of an intervention justify its harms and costs.¹⁰

Without formal education on cost-conscious care, learners may adopt whatever practices are modeled by supervising physicians. Historically, physicians have utilized a “more is better” approach, a practice which is then adopted by their learners.¹¹ In 2010, Molly Cooke published her perspective on the responsibility of medical education to teach cost consciousness,¹² and other medical educators have subsequently called for an integration of cost information into the education of future physicians.^{13–15} Fortunately, internal medicine organizations such as the American Board of Internal Medicine (ABIM) and the American College of Physicians (ACP) are leading efforts to focus the conversation on improving the value of healthcare.^{15–17} The *Choosing Wisely* campaign led by the ABIM Foundation asks physicians and patients to choose care that is evidence-based and truly necessary.¹⁸ The ACP has published online curricula regarding high-value care for physicians and resident learners.^{16,19} Recently, MedU (an online compendium of educational programs for health professions),

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the ACP, and the Alliance for Academic Internal Medicine (AAIM) collaborated to produce an online curriculum on high-value care for medical students.²⁰ Prior to the launch of the student curriculum in June 2014, however, there had been little focus on medical student education related to high-value care. Furthermore, students' perceptions of the delivery of healthcare and its associated value (or lack thereof) are not known.

At the Ohio State University College of Medicine, we developed and implemented an integrated curriculum on cost-conscious care designed for medical students during the clinical (Med 3–4) years, the initial implementation of which preceded publication of the aforementioned resources. In March 2012, our curriculum piloted a case conference discussion during an 8-week sub-internship-emergency medicine experience. In this setting, discussants used a patient case with real hospital charges to highlight how inefficiencies, lack of communication, and redundant care can impact cost. In July 2012, we added experiences across inpatient internal medicine, family medicine, emergency medicine, and ambulatory internal medicine settings. In this study, we describe the curriculum integrated into the inpatient internal medicine clerkship and our analysis of student responses submitted as reflective writing utilizing their patient care experiences to highlight opportunities to improve the value of care.²¹ To our knowledge, this is the first study to examine medical student perceptions of healthcare delivery as it relates to value and cost consciousness.

METHODS

Participants and Setting

The study population was comprised of third-year medical students attending the Ohio State University College of Medicine during the 2012–2013 academic year, who participated in an exercise on cost-conscious care while in the inpatient internal medicine clerkship. Students completed a Web-based learning module, outlining principles of cost-conscious care and providing guidance on how these principles could be applied in the inpatient setting. The module was based on clinical guidelines regarding high-value, cost-conscious care that had been published in 2011²² and students were provided with the definition of “value” in healthcare and with examples of how to avoid low-value care. Along with the module, students received a list published by the ACP of 37 situations that did not reflect high-value care.¹⁰ Examples included performing an echocardiogram on patients with an innocent-sounding murmur or performing head imaging on patients with syncope and a normal neurologic exam. The module also used a real patient case with institutional charges to highlight how repetitive or unnecessary testing quickly adds to a patient's final bill. Students were provided time at the beginning of the clerkship to complete the module, which was delivered using the Articulate® platform and took approximately 20 minutes to complete. Following completion of the module and prior to the end of their 8-week clerkship, students

completed a reflective exercise with three prompts asking about their experiences with cost-conscious care ([Appendix 1](#)). The first prompt required the student to identify and describe a scenario in which a patient for whom the student had personally provided care experienced a “lack of attention to cost-conscious care.” Second, the student was asked to identify a solution that could be implemented “tomorrow” to reduce wasteful care. The student was asked to discuss a potential barrier to implementing the proposed solution. As a short survey of the learning environment, the student was asked whether the faculty on inpatient services discussed cost versus benefit in relation to patient care. If a student responded “No” to that question, they were asked whether they would feel comfortable bringing up the issue of cost-conscious care with their team. We analyzed these reflections over the first 6 months of the 2012–2013 academic year in order to learn more about student awareness and perceptions regarding the practice of cost-conscious care within our medical center.

The study was deemed exempt from review by our institutional review board.

Study Design

This study was a retrospective analysis of de-identified medical student narratives describing patient care scenarios wherein students perceived a lack of attention to cost-conscious care. We conducted a qualitative review of the narratives using the constant comparative method of coding and analyzing for themes. Initial codes were identified using a grounded theory approach. Employing the concept of investigator triangulation, we assigned each reflection to two reviewers. A third reviewer was used whenever a coding discrepancy occurred. With this method, the researchers independently read narratives and assigned descriptive codes in an iterative manner, meeting periodically to further define and categorize codes and to explore and understand differences in coding, with the purpose of achieving consensus. Group analysis of codes, categories, and emergent themes involving all three investigators was used to determine final coding (see [Tables 1, 2, and 3](#) for final codes). As was previously noted in the literature, a single narrative could contain multiple themes [7]. To resolve this issue, for any narrative containing multiple concepts, each concept was coded separately in order to prevent loss of data. Themes and sub-themes (categories) that emerged were then assessed for frequency of occurrence.

RESULTS

Eighty of 111 eligible students submitted the assignment between July and December 2012, representing a 72 % participation rate. For the first question, in which students were asked to describe a patient scenario, students identified 87 separate scenarios, with 115 discrete problems recognized. Three students who completed the assignment were unable to provide an example of low-value care. Four themes emerged:

Table 1 Examples of “Lack of Attention to Cost-Conscious Care” Identified by Students¹

Categorized themes with subcategories (n=115)	Frequency
Unnecessary hospitalizations	11
• Unnecessary days (8)	
• Unnecessary hospital stays (3)	
Unnecessary tests or treatments	69
• Unnecessary labs (27)	
• Unnecessary imaging (20)	
• Unnecessary tests – not specified (3)	
• Unnecessary procedures (9)	
• Unnecessary medications (7)	
• Unnecessary blood products (3)	
Duplicative tests or treatments	20
• Duplicative labs (8)	
• Duplicative imaging (9)	
• Duplicative procedure (1)	
• Duplicative medication s (2)	
Expensive versions of tests or treatments	11
• Expensive imaging (1)	
• Expensive medications (10)	
Uncategorized problems	4
• Family request for continued care despite medical futility (1)	
• Initial error in CXR read, leading to extra care (1)	
• Extra days in step-down unit, not medically indicated (1)	
• Frequent neurologic checks, not medically indicated (1)	

¹Categorization of scenarios provided by students. These categories are not mutually exclusive, as some students presented scenarios with many aspects of low-value care included in the same scenario. All data is included

unnecessary hospitalizations, unnecessary tests and treatments, duplicative tests and treatments, and expensive versions of tests and treatments. The most common problems identified included unnecessary tests and treatments (69) and duplicative tests and treatments²⁰ (Table 1), with selected quotes highlighted in Text Box 1.

Table 2 Solutions for Reducing Wasteful Care²

Categories of Solutions (n=125)	Frequency
Process	
Engage in discussion with the team (speak up, ask why)	28
Increase awareness and utilization of evidence-based guidelines	19
Improve communication (with outside hospitals, interdisciplinary or inter-professional team members)	15
Give information on costs to the provider	5
Increase awareness of patient's ability to pay	2
Single response tactic	2
• Require providers to give a medical indication for any tests or treatments ordered	
• Track provider ordering practices through the electronic health record (EHR)	
Intervention	
Focus lab testing	38
Stop medications no longer needed	8
Reconcile inpatient/outpatient medications for cost or formulary differences	2
Encourage judicious use of medical supplies	2
Single response end result	3
• Expedite discharges	
• Improve order reconciliation	
• Remove catheters (lines) that are no longer needed	

²Categories of solutions listed are not mutually exclusive. Many students provided a multifaceted solution to the low-value care presented in their scenario (see Table 1). All data is included

Table 3 Barriers to Implementing Solutions for Reducing Wasteful Care³

Categories of Barriers (n=80)	Frequency
Increased time (15) and effort (4)	19
Ingrained practices (resistance to change)	17
Defensive medicine (11) or fear of missing something (7)	18
Team factors	7
• Hierarchy (5)	
• Variable knowledge levels among team members (2)	
Patient population variable: high patient complexity (2) or patient volumes (2)	4
Individual patient-related variables	3
• Patient demands driving healthcare (2)	
• Patient low health literacy	
Lack of consensus between physician teams (primary vs consulting)	4
Delayed discharge	3
• Weekend admission (1)	
• Late rounds (1)	
• Lack of outpatient follow-up (1)	
Uncategorized (single response items)	5
• Concern that integration of cost information results in “information overload” (1)	
• Concern that less care would be considered inadequate care (1)	
• Practice of doing more for a patient to “justify the admission” (1)	
• Relative shortage of doctors (1)	
• Difficult clinical judgment manifested as hesitancy to remove a line due to concern for a future need (1)	

³Categories of barriers listed are not mutually exclusive. Many students identified multiple barriers to the solutions presented in their scenarios (see Table 2). All data is included

Text Box 1. Selected Quotes from Examples of “Lack of Attention to Cost-Conscious Care”

Unnecessary hospital days

- “I had a patient with terminal lung cancer and pneumonia. He would have benefited more from hospice care over staying in the hospital, and that option should have been brought up much earlier.”
- “There was a patient who was an illegal immigrant who has stayed in the hospital on the order of months because he had nowhere to go.”

Unnecessary tests or treatments

- “A patient on our service is currently being worked up for very vague symptoms...and the amount of money spent thus far is staggering. I would suggest our team start with more conservative testing based on the most likely diagnosis to decrease the amount of ‘shotgun’ testing that is currently underway.”
- “Nearly every patient admitted to our [general medicine] service received a CXR, regardless of indication. And it didn't stop there; most times they would receive another CXR within the next day.”

Duplicative Tests or Treatments

- “There were numerous occasions where patients were transferred from an outside hospital (OSH) with CD images of X-rays and CT scans from the prior day; yet these were repeated.”
- “There was a patient who underwent a lumbar puncture in our hospital. He left the previous hospital due to lost CSF fluid preceding analysis. Unfortunately, the same situation occurred; we had to repeat our LP, as the fluid was lost somewhere between the procedure and the pathology lab.”

Expensive Versions of Tests or Treatments

- “The patient received an expensive long-acting bronchodilator... This inhaler was the most expensive of all inhalers, and it wasn't one she necessarily needed. The plan was to send her home on this medication, even though she told the team she didn't have insurance and could not afford the medication.”
- “One of my patients was an HIV patient who had been off her Atripla for over a year due to the high cost. Atripla is the current “best” HAART [highly active antiretroviral therapy] medication but is also far and away the most expensive. It is the least likely to be covered by the financial assistance programs, even for AIDS resources. This woman was indigent and had few resources, and is now facing dire complications from uncontrolled sepsis and endocarditis.”

With regard to solutions for combating low-value care, students described 82 scenarios, with 125 potential solutions identified. One student did not identify a solution to improve healthcare value. In 37 scenarios (45.1 %), more than one solution was identified for the same scenario. For many solutions offered by students, the codes and categories converged into one of two themes based on whether the student articulated the solution as a “process” or an “intervention” (Table 2). Students most commonly used discussion with the team (speak up, ask why) as the process they would use (n=28) and most often wanted to focus lab testing (n=38) as the intervention. Text Box 2 contains selected quotes regarding solutions for reducing low-value care.

Text Box 2 Selected Quotes on Solutions to Reduce Wasteful Care

Engage in discussion with the team

• “One easy solution is to hold each other accountable during rounds by questioning each major decision in management. If it will not change your management, then definitely think twice about ordering tests.”

• “Tomorrow, I could ask the reasoning behind obtaining a BNP if a new patient is admitted in obvious acute or chronic heart failure.”

Increase awareness and utilization of evidence-based guidelines

• “One solution involves researching evidence-based guidelines and presenting these to the team on rounds each day. Each member of the team could rotate and present a different topic.”

• “Evidence-based guidelines can be used when making decisions about testing. My attending on Gen Med did this the first day, and this seemed to cut back on the testing done for patients.”

Improve communication (with outside hospitals, interdisciplinary or interprofessional team members)

• “A solution to implement on my team is to obtain prior records for patients recently admitted to outside hospitals to prevent repeat testing or recent imaging.”

• “On the pulmonary consult team, we were frequently asked to do certain procedures (bronchoscopy, etc.) I think the team, especially the fellow, was really good about discussing the pros and cons of the procedures and if they would really be useful for diagnostic purposes.”

Focus lab testing

• “One solution that our team could implement is to consider choosing tests that will yield the most results with the lowest costs. This would prevent the shotgun approach testing that has a low likelihood of valuable information.”

• “One solution to reduce wasteful care is to make an exercise of asking for a justification for each lab test ordered as it relates to patient care and management. It is far too easy to order daily labs such as chemistries and CBCs, to the point of it being a reflex.”

Stop Medications No Longer Needed

• “One solution is to review the medication list every day. This ensures that patients are not only receiving adequate medical therapy but also avoids the risk of using unnecessary medications, which is not only cost-ineffective but also potentially harmful to the patient.”

• “Perform an antibiotic time-out and treat with patient with directed therapy instead of empiric therapy.”

There were 80 responses to the request to identify barriers to improving high-value care related to an identified solution. Fifteen students (18.8 %) did not identify any barriers. Eleven (13.8 %) responses identified more than one barrier for a given scenario. The most common themes that emerged were increased time and effort, ingrained practices, and defensive medicine (Table 3.) Text Box 3 contains selected quotes regarding barriers to improving high-value care.

Text Box 3 Selected Quotes on Barriers to Implementing Solutions for Reducing Wasteful Care

Increased time and effort

• “The barrier is that [going through a patient's medications] requires a time commitment that sometimes is not possible for busy interns and residents.”

• “I think sometimes it's easier to just look at a bunch of test results to rule out different diseases.”

Ingrained practices (resistance to change)

• “It is really the culture of the hospital to get AM labs on every patient, so change the culture and the way things are done would be a barrier.”

• “A barrier could be that some physicians are accustomed to always having this extra information (daily CBC, frequent vitals) even if they don't change care plans, so they could be resistant to change.”

Defensive medicine or fear of missing something

• “The biggest barrier is that physicians feel it necessary to rule out each diagnosis on the differential in fear of legal ramifications.”

• “A barrier is that there may be a possibility of missing a diagnosis or complication in the hospital if the patient's electrolytes or blood counts are not constantly available.”

Patient-related variables

• “One barrier could be dealing with difficult patients who are demanding certain tests, especially those which evidence has shown to not be helpful.”

• “One barrier would be if patient autonomy conflicted with the medical team's ideas. For example, a medical team may want to reduce wasteful care, but a patient and their family may request more care in hopes of finding a solution.”

In response to whether faculty were discussing cost versus benefit in relation to patient care, 73 (91.3 %) stated that an attending physician had addressed cost versus benefit with the team. Seven students (8.8 %) reported that the topic was not discussed with their attending during routine patient care. Sixteen students responded to the follow-up question as to whether they felt comfortable bringing it up to their teams (despite the fact that this question was intended only for students who felt that an attending had not addressed cost versus benefit with them.) Fourteen students (87.5 %) said that they would feel comfortable, while two (12.5 %) said that they would not feel comfortable as a student bringing up the topic of cost and value.

DISCUSSION

Here, we report the findings of a qualitative analysis of medical student perceptions of cost-conscious care during their inpatient medicine clerkship. The most common situation identified by students was one in which tests were performed that did not change the patient's management. This concept was highlighted in our curriculum, in which students learned about the appropriate use of screening and diagnostic tests to foster cost-conscious care.¹⁰ Students less commonly identified scenarios in which the healthcare setting (i.e., extra days in the hospital) influenced healthcare costs, which is a significant contributor to healthcare spending.²³ Although students were provided with bed charges typical for our institution, our module did not emphasize judicious use of the hospital setting as a means to control cost. Additionally, the students included in this study were completing their inpatient clerkship during

the first half of the academic year, and may not have had sufficient knowledge of or exposure to ambulatory medicine or triage decisions to be as aware of this potential contributor to unnecessary healthcare costs.

With regard to potential solutions for reducing wasteful care and the associated barriers, students gravitated toward solutions that increased or improved communication within their healthcare teams (engage in discussion) or across teams (with consultants, referring hospitals, etc.) The use of evidence-based guidelines was also frequently cited as a solution. These simple, and perhaps less innovative, solutions may reflect the fact that students were asked to provide solutions that could be implemented “tomorrow.” Students seemed to gravitate to solutions that they could personally implement, such as bringing evidence-based guidelines to rounds or asking their team whether a test was truly necessary. Given that engaging in discussion and improving communication were the most common solution responses, it is not surprising that the most commonly identified barrier was the increased time and effort associated with having the “extra” discussions as well as the time and effort associated with carrying out actions (such as use of checklists) to eliminate redundancy and reduce unnecessary care. Students’ comments reflected their sensitivity to the task burden already placed on residents and their hesitancy to suggest solutions that added time or tasks for residents.

Even with minimal clinical experience, medical students intuitively identified causes of low-value care as well as potential solutions. These observations and perceptions of early clinical learners are consistent with the findings from resident reflections at other institutions, namely, the vignettes published through the Do No Harm project launched at the University of Colorado and the subsequent JAMA series, “Teachable Moments.”²⁴ Our experience suggests that medical students may provide valuable insights and contributions that may ultimately improve the value of care provided at hospitals in which they learn. Although students identified healthcare team hierarchy as a potential barrier to improving high-value care, the majority of students who responded to the question regarding their comfort level with broaching the topic of healthcare value stated they would feel comfortable bringing up the topic to their teams. The relevance of this positive feedback, however, is limited by the low response rate to the question. Nevertheless, future efforts to improve the value of healthcare should empower learners at all levels to assist in changing the hierarchal culture of healthcare and to develop and implement solutions that will add value to patient care and streamline healthcare delivery.

Key limitations of this study included its single-site and retrospective design. Additionally, our participation rate was modest, and not all students submitted a reflective exercise. This was likely influenced by multiple factors, such as the fact that the e-learning modality was new to the students and that the module on cost-conscious care was the only e-module linked to an “assignment.” Furthermore, there were no repercussions for failure to complete the exercise. In addition, since

the reflective exercise was associated with an educational module, student responses may have been prone to availability bias insofar as they may have been influenced by examples in the module or prompts provided in the reflective exercise. For instance, the use of evidence-based guidelines was provided as an example in the prompt asking for potential solutions. Notwithstanding these limitations, however, this study provides insight into the perceptions of early clinical learners as they relate to healthcare value.

Changing the US healthcare landscape with regard to provision of care will require a major paradigm shift in how providers approach care delivery. Although medical students are least able to affect ordering practices, they are in a position to provide valuable insight into opportunities for implementing a leaner approach to providing healthcare services. As with other recent initiatives (quality improvement, for example), education and empowering physicians to promote healthcare value will require a multifaceted strategy that engages faculty physicians, residents, and medical students simultaneously. As Varkey pointed out in her meta-analysis,⁵ a multimodal approach involving education and point-of-decision reminders are most helpful in providing cost-conscious care. Since medical students do not frequently place orders, we believe a reflective assignment that encourages them to think of ways they can be more cost-conscious will promote a mindfulness of healthcare value. This type of “grassroots” approach has been highlighted with resident learners in other institutions and has been rewarded by various organizations.²⁵ In addition, while a single Web-based module is insufficient for teaching principles of healthcare finance and value, we believe that the use of these types of modules allows for asynchronous “just-in-time” learning. Our initial curriculum spaced out cost-conscious care content across clerkships in the third and fourth years of medical school.²¹ With the publication of online modules created by MedU/ACP/AAIM, all medical schools have free access to content on high-value care that is relevant to adult medicine. These modules should serve as a springboard for conversations and small-group discussions to address local barriers to cost-conscious care.

Conflict of Interest: The authors declare that they do not have a conflict of interest.

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APPENDIX

Cost-Conscious Care Exercise for IM Clerkship

1. Identify a patient that received care where there was lack of attention to cost-conscious care. (Examples include redundant testing, unnecessary expensive medications (IV instead of po), etc.) Describe the nature of the unnecessary or redundant care provided to your patient.
2. Describe one solution that you could implement tomorrow on your team to reduce wasteful care. Consider whether the application of evidence-based guidelines could be useful in providing more efficient care. Briefly also discuss a barrier to implementing this solution.
3. To date on this rotation, has any attending discussed cost versus benefit as it applies to particular patient care? YES / NO If not, would you feel comfortable introducing this issue to your team?