Wisdom of the Crowd: Bright Ideas and Innovations From the Teaching Value and Choosing Wisely Challenge

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Abstract

Problem
Medical education has been cited as both part of the problems facing, and part of the solution to reforming, the increasingly challenging U.S. health care system which is fraught with concerns regarding the quality and affordability of care. To teach value in ways that are impactful, sustainable, and scalable, the best and brightest ideas need to be shared such that educators can build on successful existing innovations.

Approach
To identify the most promising innovations and bright ideas for teaching value to clinical trainees, the authors hosted the "Teaching Value

and Choosing Wisely Challenge." The challenge used crowdsourcing methods to solicit scalable, pedagogical approaches from across North America, and then draw generalizable lessons.

Outcomes
The authors received 74 submissions (28 innovations; 46 bright ideas) from 14 students, 20 residents/fellows, 38 faculty members (ranging from instructors to full professors), and 2 nonclinical administrators. Submissions represented 14 clinical disciplines including internal medicine, emergency medicine, surgery, pediatrics, obstetrics–gynecology, laboratory medicine, and pharmacy. Thirty-nine abstracts focused on graduate

medical education, 15 addressed undergraduate medical education, and 20 applied to both.

Next Steps
The authors have solicited, shared, and described solutions for teaching high-value care to medical trainees. Challenge participants demonstrated commitment to improving value and ingenuity in addressing professional barriers to change. Further success requires strong local faculty champions and willing trainee participants. Additionally, the use of data to demonstrate the collective positive impact of these ideas and programs will be critical for sustaining pedagogical changes in the health professions.

Problem

Americans have become increasingly frustrated with the U.S. health care system, which is challenging to navigate and fraught with concerns regarding the quality and affordability of care. The United States significantly outspends peer countries while delivering inferior outcomes.

Medical education has been cited as both part of the problem facing the U.S. health care system—and part of any potential solution. Medical school training in health care systems and in context of care is lacking.[1] Furthermore, a hidden curriculum in training can encourage and reward overutilization.[2] Physicians are largely unaware of how decisions they make

impact what insurers, providers, or patients pay for care.[3] Recently, medical education has been considered a venue for creating a more cost-conscious clinical workforce,[4] and professional leaders have proposed a new "high-value care" competency. Moreover, policy makers are exploring linking graduate medical education funding to curricula that teach trainees about value.[5]

To understand how to teach value in ways that are impactful, sustainable, and scalable, the best and brightest ideas need to be shared such that educators can build on successful existing innovations. "Crowdsourcing" is a low-cost strategy using online social media platforms to do just that: to share ideas among and solicit contributions from a large group of people.[6] Thus, we decided to use crowdsourcing for our "Teaching Value and Choosing Wisely Challenge," to identify the most promising pedagogical approaches that can be successfully implemented on a larger scale.

Approach

We launched the Teaching Value and Choosing Wisely Challenge as a joint

effort of the ABIM Foundation and Costs of Care, Inc. The challenge was designed to meet four main goals: (1) to identify champions of high-value care in medical education, (2) to characterize solutions for teaching high-value care that are currently in use by medical educators, (3) to catalyze new ideas and methods for teaching high-value care to trainees, and (4) to promote promising ideas that are easily adopted and scaled.

We solicited submissions from across the United States and Canada over three months in spring 2013 in two categories: "innovations" representing implemented projects, and "bright ideas" representing proposed projects. We welcomed entries from clinicians of any discipline and level of training, as long as their project engaged clinical trainees. Entries took the form of a brief, structured, written description. The maximum length was 500 words, and we allowed two supporting figures or documents. We provided a sample abstract and an e-mail address for any questions. We announced the competition via press release, print advertisements, and social media. We

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received entries through an electronic Web-based submission form and through the mail.

For the initial review of the entries, three competition co-chairs (N.S., C.M., V.M.A.) independently scored all the abstracts by assigning one point to each criterion of two frameworks. The first were the FINER criteria which specify whether a program is Feasible, Interesting, Novel, Ethical, and Relevant.[7] The second criteria, COST, which was developed by our team, assessed four areas of impact: Culture, Oversight, Systems, and Training (see Chart 1). The highest score any entry could earn was 9.

We averaged the initial scores of each co-chair for each of the entries, and we used the highest scores to choose 14 semifinalists (7 authors of innovations; 7 of bright ideas). Next, we interviewed the semifinalists via video conference to better understand potential barriers to widespread implementation. We selected 10 abstracts (5 from each group), along with the corresponding interview notes and supplemental materials, to advance to review by a panel of five expert judges who ultimately selected 6 finalists (3 from each group; see List 1). The expert judges were senior leaders from the American College of Physicians, the American College of Surgeons, the Association of American Medical Colleges, the Centers for Medicare and Medicaid Services, and the Consumers Union. Judges worked together via teleconference over one month to review submissions and select finalists. We invited the 6 finalists to present their submissions at a joint meeting of the ABIM Foundation, the Macy Foundation, and Costs of Care, Inc. Winners received reimbursement for conference travel, but no additional remuneration.

Outcomes

We received 74 submissions (28 innovations; 46 bright ideas). Participants comprised 14 students, 20 residents or fellows, 38 faculty members (ranging from instructors to full professors), and 2 nonclinical administrators. Several participants contributed more than one submission, underscoring their enthusiasm for this effort. Submissions represented 14 clinical disciplines including internal medicine, emergency medicine, surgery, pediatrics, obstetrics–gynecology, laboratory medicine, and pharmacy (Table 1). At least 1 abstract had an interprofessional focus, and 28 abstracts were applicable to more than one clinical specialty. Thirty-nine abstracts focused on graduate medical education, 15 addressed undergraduate medical education, and 20 applied to both.

When using the FINER criteria, we noted a tension between feasibility and novelty. Novel submissions often left us with doubts about translation and scale, while highly feasible submissions often lacked novelty. Application of the COST framework balanced this tension. Whereas all submissions included a training component, those that also addressed culture, oversight, and/or systems received higher scores through the COST framework.

In their interviews, semifinalists reported that because teaching value has not been an inherent part of medical training, they faced several organizational challenges including generating buy-in from relevant institutional stakeholders and finding time within crowded curricula. They overcame these challenges using various pedagogical approaches, which we have organized into the six categories described below.

High-yield case vignettes

Case vignettes, traditional starting points for clinical inquiry, are important teaching tools in medical education. University of Colorado faculty encouraged medicine trainees to recount real patient cases illustrating harms of "too much medicine." Through this Do No Harm Project, faculty members act as mentors, helping trainees to develop cases; trainees are allowed a full, protected day on the rotation for writing; and excellent examples are published on a University of Colorado Web site. The success of this effort motivated a new "Teachable Moments" series in *JAMA Internal Medicine*.[8]

In another example, medical students at the University of Toronto have been developing virtual interactive case vignettes in which students manage the care of virtual patients by selecting history, workup, and treatment options from a preset menu. The efficiency of their decisions, in both time and cost, are measured along with clinical decision making. Similar case vignettes were proposed by trainees and faculty at the Virginia Commonwealth University; The University of Chicago; and The University of Alabama, Birmingham.

Linked didactic and experiential learning

Many challenge participants integrated teaching value into existing learning opportunities, including didactic lectures, conferences, and journal clubs. In these cases, the participants paired standard review of the evidence with discussions of costs for various management strategies. For example, a University of Pennsylvania medical student proposed a senior elective for students to compare the anticipated charges associated with an ideal management plan with the true or actual charges associated with a real patient's management. A Tufts Medical

Chart 1

COST Framework for Initially Scoring Submissions for the "Teaching Value and Choosing Wisely Competition," Through Which Physicians and Physician Trainees Submitted Novel Approaches to Teaching Value to Medical Trainees in 2013

Interventions		Description	Example
C	Culture	Valuing cost-consciousness and resource stewardship at both the individual and team level	Hospital-wide campaign led by peer champions to reduce lab test overuse
O	Oversight	Requiring accountability for cost-conscious decision making at both a peer and organizational level	Requiring attending to review labs that residents order to reduce overuse
S	Systems change	Creating systems to make cost-conscious decisions using institutional policy, decision-support tools, and clinical guidelines	EHR displays cost of lab tests next to order for specific tests
T	Training	Providing knowledge and skills clinicians need to make cost-conscious decisions	Lecture or workshop on ordering of lab tests

Abbreviation: EHR indicates electronic health record.

List 1

Descriptions of Submissions Selected as Finalists for the "Teaching Value and Choosing Wisely Competition," Through Which Physicians and Physician Trainees Submitted Novel Approaches to Teaching Value to Medical Trainees in 2013

Innovations[a]

- A didactic curriculum created by residents that uses Bayesian analysis to identify efficient care pathways, inspired by real resource constraints in the wake of Hurricane Sandy
- A competition that uses institutional charge data to encourage faculty and trainees to construct cost-effective care plans during internal medicine morning report
- A trainee-authored case vignette series, inspired by real patients who experienced harm from overuse, that is published on the Web and has become the basis of a new journal series

Bright Ideas[a]

- A competition for trainees seeking high-value care proposals with an institutional commitment to help implement the winning idea
- A senior medical student elective with a capstone project in which real patient charges are compared with the charges of an ideal care plan
- Individualized dashboards that allow trainees to compare their laboratory and radiology ordering practices with those of their peers

[a]The authors defined innovations as extant projects or approaches; they defined bright ideas as proposed projects or approaches.

School student proposed spending a full day with the billing department to understand how care is interpreted by medical coders.

Process-improvement efforts

Several participants described process-improvement efforts that addressed unnecessary laboratory or radiology tests.

A faculty member from the Alameda Health Center described a multiyear effort to "rightsize" lab testing by identifying commonly ordered, low-value tests (e.g., d-dimer, hereditary hypercoagulability) and by broadly engaging faculty in the development of new clinical protocols. University of Nevada faculty proposed a clinical protocol to decrease unnecessary

Table 1

Breakdown of the 14 Clinical Disciplines Represented by the 76 Submissions in the "Teaching Value and Choosing Wisely Competition" Through Which Physicians and Physician Trainees Submitted Novel Approaches to Teaching Value to Medical Trainees in 2013

Clinical discipline	Innovations[a]	Bright Ideas[a]	Total number of submissions
Internal medicine	8	18	26
Emergency medicine	2	0	2
Pediatrics	1	1	2
Obstetrics–gynecology	0	3	3
Family medicine	2	2	4
Geriatrics	1	1	2
Orthopedics	1	0	1
Neurosurgery	0	1	1
Cardiology	0	1	1
Hematology/oncology	0	1	1
Gastroenterology	1	0	1
Lab medicine	1	0	1
Interprofessional	1	1	2
Pharmacy	1	0	1
All disciplines	2	7	9
No discipline named	7	10	17

[a]The authors defined innovations as extant projects or approaches; they defined bright ideas as proposed projects or approaches. Some abstracts may have addressed more than one discipline; the authors categorized each abstract into a discipline based on the primary discipline targeted.

use of autoimmune panels, and a faculty member from the Banner Good Samaritan Medical Center in Arizona described a clinical protocol to decrease unnecessary use of computed tomography scans in the emergency room.

Some of the most impactful process-improvement innovations were led by housestaff. Emergency medicine residents at New York University found themselves with significantly restricted diagnostic testing options when Hurricane Sandy shut down their medical center, turning it (Bellevue) into a freestanding emergency ward. Using Bayesian analysis to redesign several care pathways, they discovered more efficient testing strategies and disseminated these to their peers through a resident-delivered didactic series. A University of California, San Francisco resident noted an institutional discrepancy in hepatocellular carcinoma screening in hepatitis patients between hepatologists and radiologists. Working with the leaders of both groups, she reconciled the disparity by implementing a decision-support system that decreased unnecessary ultrasounds by 30% in three months.

Coaching and role modeling

Some faculty participants emphasized the importance of coaching and role modeling. A faculty member from the University of Toronto emphasized the need to teach faculty to "celebrate restraint"[4] by validating, through praise, judicious use of resources. A faculty member from the University of Colorado Anschutz Medical Campus described a monthlong "clinical efficiency" coaching program that includes daily reflection and deliberate practice-planning to teach trainees high-value care.

Competition and gamification

Contests and games are increasingly being used to drive innovation. Inspired by our challenge, faculty from The University of Arizona proposed a high-value care competition for trainees across multiple programs in the Banner Good Samaritan Medical Center system. Finalists, selected by the hospital quality section and chief medical officer, will receive both institutional and monetary support to implement their idea. This effort has already (May 2014) garnered 42 proposals. A faculty member at The University of Alabama, Birmingham proposed an internal competition to

reconcile multiple redundant and/or confusing computerized laboratory orders that contribute to low-value testing by using the prompt "$40,000 to take the top 40 lab tests and communicate name, indication, and cost in 40 characters or less." The competition reduced and simplified the multiple ways to order a vitamin D level in the electronic health record, making those that are of higher value more obvious or intuitive.

Several participants proposed using some form of gamification (or taking advantage of game thinking and game mechanics) to engage participants in problem solving. Proposed approaches include a version of *The Price Is Right* through which participants guess the costs of routine tests and a medication cost contest in which teams of trainees compete to design the least costly discharge medication list for a hypothetical patient. A Yale faculty member restructured traditional morning report so that trainees competitively compared the anticipated charges associated with their workup plans. He proposed expanding this game to include competition between trainees at different programs.[9]

Price transparency, feedback, and dashboards

Several educators proposed leveraging already-in-place decision-support systems to provide trainees with transparent point-of-care information and feedback on resource utilization. A faculty member at Johns Hopkins University described a project that led to a statistically significant reduction in laboratory testing simply by displaying the Medicare allowable fees in the computer order-entry system. A University of Pennsylvania fellow highlighted many ways that order-entry systems could be modified to encourage high-value ordering, including displaying prices of tests or using default options to increase generic medication prescribing.

A different University of Pennsylvania attending proposed providing interns with assessment and feedback related to their adherence to a selected group of recommendations from the *Choosing Wisely* campaign, a large effort led by the ABIM Foundation to disseminate best practices. A Johns Hopkins University attending proposed electronic dashboards for trainees to compare their ordering practices, especially around labs and radiology, with those of their peers. Faculty at the University of Texas Southwestern Medical Center proposed a mobile application that will require trainees to rate the appropriateness of their test ordering on a randomly audited cardiology patient and compare their assessment with existing guidelines.

Next Steps

The results of our challenge demonstrate enthusiasm for teaching value and "Choosing Wisely" across professional disciplines and specialties. We have solicited, shared, and archived[10] ideas and innovations from a nationwide cohort of students, residents, fellows, and faculty who are actively seeking ways to fill the current gap in value-based teaching. Interestingly, similar solutions were being undertaken independently in different geographic locations and specialties, highlighting potential for broad adoption of approaches to teaching and learning high-value care.

There are several strengths to using a competition-style approach to solicit promising solutions to teach value. First, the competition format has allowed us to share ideas beyond traditional institutional and professional silos. Second, the competition has unearthed new, still-untested ideas and innovations that do not meet the benchmark for publication in traditional scholarly venues. Third, the review process of the competition allows the most promising innovations and bright ideas to be highlighted.

We have shared and characterized a number of solutions for teaching high-value care to medical trainees, and our competition participants have demonstrated commitment and ingenuity in their ideas for surmounting institutional challenges to implementing their programs. Ongoing success of the innovations and ideas (and of our competition) requires strong local faculty champions and willing trainee participants. Moving forward, using data to demonstrate the positive impact of the ideas and innovations will be critical for sustaining, scaling, and sharing and adopting them.

Our challenge was successful in meeting the goals of identifying champions, characterizing solutions, and catalyzing new ideas. We launched a second iteration of the Teaching Value and Choosing Wisely Challenge on November 1, 2014. All participants from both the first and second challenge will be invited to join a learning network hosted by Costs of Care that will pair promising ideas with community support to assist implementation efforts.

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