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Of Value: A Discussion of Cost, Communication, and Evidence to Improve Cancer Care

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ABSTRACT

The U.S. spends far more per person than any other country in the world in treating cancer, without demonstrably superior results. Though the pursuit and pace of innovation in oncology are perhaps unmatched and promise great benefit for cancer patients, this explosion of innovation has been accompanied by dramatic increases in cost, often without significant increases in patient survival. These trends have led to a growing interest in addressing value—understood as treatment benefits or quality weighed against economic cost—in cancer care. In February 2009, the Institute of Medicine convened a group of experts with diverse perspectives, including those of clinical oncology, patient advocacy, the insurance industry, pharmaceutical manufacturing, health economics, and bioethics, to identify challenges to value in cancer care, suggest potential solutions, and discuss what value entails in oncology. This article presents many of the ideas that emerged from this symposium, including ways to correct misaligned economic incentives, improve clinical communication, and generate evidence to promote value in cancer care. ***The Oncologist*** 2010;15(suppl 1):73–79

INTRODUCTION

Value is not a simple term to define in cancer care. Though value is often understood as benefits of treatment or quality of care weighed against the economic cost, it has been less clear which costs and benefits must be considered. Notwithstanding this need to clarify its definition, the combination of increasingly unsustainable rises in the costs of cancer care, the accelerating pace of expensive innovations in oncology, and persistent hope for rescue in patients with life-threatening disease now require solutions that incorporate and promote value. To examine the concept of value in cancer care, identify challenges to improving value, and develop solutions to promote value in practice, the Institute of Medicine (IOM) convened a group of experts from clinical oncology, cancer research, patient advocacy, the insurance industry, pharmaceutical manufacturing, health economics, bioethics, and public policy in February 2009. These thought leaders found a great deal of common ground, and the ideas that emerged from their discussions offer opportunities—from small-scale practice changes to sweeping systems improvements—for greater value in oncology. This article revisits many of the ideas that emerged from

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this IOM symposium with the aim of furthering the ongoing discussion to improve value in oncology.

The Cost of Innovation in Cancer Treatment

Cancer therapy is a major focus of innovation in medicine, and the attention it receives does not appear to be slowing. Worldwide, drugs associated with cancer care are estimated to cost approximately $40 billion per year [1]. In the U.S., we spend roughly twice as much as any other country per capita without demonstrably superior results in treating cancer [2, 3]. With cancer drug sales growing by 15% annually—twice the rate of the overall market—cancer drugs represent the second largest category of overall pharmaceutical sales [1]. Currently, at least 100 new molecules for cancer treatment are in phase III trials [1], and there is no indication that these drugs will be any less expensive than proprietary drugs already on the market. This stream of expensive new treatments presents a significant challenge to value.

During the IOM symposium, Janet Woodcock of the Center for Drug Evaluation and Research at the U.S. Food and Drug Administration (FDA) reported that cancer is perhaps the most active area of treatment development of all fields of medicine, with many new cancer drugs coming to market soon and many more in the pipeline. Between July 2005 and December 2007, the FDA approved 53 new indications in oncology, with 18 new molecular entity approvals. The FDA has also seen a huge increase in investigational agents studied in cancer, from 925 investigational new drug applications in 2003 to 1,440 in 2008.

Many recently approved drugs in oncology carry costs of $5,000–$10,000 or more per month of treatment [1], and there is every indication that this trend in drug pricing will continue. Among the symposium attendees, there was widespread agreement that this trajectory of increased treatment costs was unlikely to be sustainable in the long term and, despite the many accompanying therapeutic advances and innovations, these rising costs pose a serious threat to value in cancer care.

Value to Whom?

Many of the financial incentives that operate in cancer care are at cross-purposes with value, driving up total treatment costs with no guarantee of better quality. Indeed, to understand the challenges facing value in oncology, it is helpful to understand the incentive structures driving the decisions of patients, clinicians, and pharmaceutical manufacturers.

Cancer patients are largely desensitized to the costs of their treatment because of their insurance coverage, explained Dr. Patricia Danzon, a health economist at the Wharton School at the University of Pennsylvania, and this desensitization to their full treatment costs means that drug prices are not significantly constrained by patients' willingness to pay. In markets that operate efficiently, willingness to pay conveys to manufacturers the value consumers place on particular resources, rewarding high-value products, reining in prices of low-value products, and setting market prices that assure efficient manufacturing resource allocation. With health insurance in place, however, patient price sensitivity is undermined, leading to what is known as moral hazard, or greater demand and a higher volume of consumption because of the absence of an economic disincentive or perceived cost. To discourage this, many insurance companies use coinsurance structures with tiered formularies that require larger patient copayments for expensive medications, but tiered drug pricing provides little disincentive to consumers because the copayments are rarely more than a fraction of the total treatment cost, usually on the order of 20%. Furthermore, this pricing structure does not promote the use of treatments with better value—only lower cost—because it does not necessarily consider treatment effectiveness or quality.

The danger of such nondiscriminating cost sharing is that it may discourage the use of all expensive medical services and treatments, not just those with low value, said Dr. Michael Chernew of Harvard Medical School. He emphasized that value is a product not only of decreasing costs but also increasing quality. A better cost sharing system for patients would not simply tier drugs based on cost—it would be value based. Value-based insurance design (VBID), in which copays are reduced for high-value services to encourage their use and copays are increased for low-value services to discourage their overuse, has already been implemented by pioneering payers to drive value in areas outside oncology, has been shown to successfully increase adherence to medications for chronic conditions, and reduces costs [4–7]. Dr. Chernew presented promising ideas for VBID in cancer care as well. He suggested that copays be kept especially low for appropriate cancer screening services to encourage patient use. He suggested that cancer patients should not be charged at the first dollar of cancer treatment because this serves only to tax those unfortunate enough to be diagnosed with cancer. Instead, low-value cancer treatments and services should be identified and patients should be charged more if they choose those treatments. Together with pursuing advances in personalized medicine with great potential for individualizing treatments, these changes could go a long way toward aligning patient incentives with greater value in cancer care.

Physicians' relationships with cost in clinical decisions are complicated and conflicted. Peter Neumann, Director of the Center for the Evaluation of Value and Risk in Health at

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the Institute for Clinical Research and Health Policy Studies at Tufts Medical Center, was author of a published survey of Massachusetts oncologists showing that 88% of oncologists thought that cost should not impact their treatment decisions at all. In contrast, the survey also found that most of the oncologists required a survival benefit of 2–4 months to justify a hypothetical, incremental treatment expense of $70,000 [8]. This represents an implicit cost-effectiveness threshold of $300,000 per quality-adjusted life year (QALY) for the hypothetical treatment, a threshold well above most standard cost-effectiveness thresholds used in health services research. These results revealed a tension many oncologists feel between a practical requirement for some treatment value for the money spent and an interest in protecting patients (and themselves) from cost concerns when considering the treatments to do the most clinical good.

Oncologists' salaries have increased 86% over the last decade, while oncology visits have only increased 12% in that time [9], said Dr. Tom Smith of Virginia-Commonwealth University's Massey Cancer Center. Although there is little or no evidence to suggest that oncologists make treatment decisions for the sole purpose of increasing profit, when deciding between two equally efficacious treatments, oncologists tend to choose the more expensive drug, according to one widely cited study [10]. This is not surprising, given that Medicare reimbursement is based on the average sales price for a drug plus a 6% dispensing fee. This 6% dispensing fee creates a perverse incentive that rewards the use of costlier therapies with bigger margins. With clinic staff (nurses, social workers, counselors), integral services (billing, electronic medical records, capital expenses), and other expenses to cover, the financial pressures oncologists feel to prescribe high-cost treatments are clearly ample and growing.

When pricing pharmaceutical treatments, drug manufacturers experience competing pressures both to recover capital from the enormous research and development investments and to accurately anticipate the drugs' effectiveness and value across the multiple indications they may be approved for over their life span. For bevacizumab, Dr. Gregory Rossi of Genentech explained, the cost associated with its development had been roughly $2.5 billion and it had been tested for indications including first-line metastatic colorectal cancer, adjuvant non-small cell lung cancer, metastatic breast cancer, and refractory glioblastoma multiforme, with ongoing trials for other indications like ovarian cancer. For each of these indications, manufacturers must consider the value of such a multifaceted treatment to a number of different consumers, including patients and also providers, payers, and regulators like the FDA, and each with a different set of priorities. Furthermore, the changing value of a given oncology product across indications and over time creates a major challenge in designing reimbursement systems that reward value and innovation appropriately.

Dr. Daniel Brock, a bioethicist at Harvard Medical School concerned about the perverse incentives he sees in cancer care, summarized the pressures driving down value in cancer care, saying "Treatment decision-makers, both doctors and patients, have little incentive to weigh the true costs of care against the benefits, payers like Medicare are largely precluded from negotiating lower costs with manufacturers, and pharmaceutical manufacturers have monopoly pricing structures allowing them to charge as much as they can get."

Though there were clearly many different perspectives on value in cancer care to be considered and different incentive structures operating for each group of stakeholders (patients, oncologists, manufacturers, payers), a common understanding of value seemed achievable to most participants at the IOM symposium, and there was clear agreement that the challenges facing value in cancer care would require cooperation and shared solutions.

Value in Clinical Communication

Barriers to value in cancer care are not simply financial. The patient–physician relationship by which cancer care is delivered can present challenges to value as well. Effective clinical communication is especially vital to ensuring value in cancer care, especially for advanced cancer and near the end of life. Whether in the straightforward discussion of a patient's prognosis or the ability to find hope for maintaining quality of life even if a patient's remaining time is short, communication and practice near the end of life can be improved, and fostering better clinical communication emerged from the workshop as an immediate next step to improve value in oncology.

Medical outcomes are strongly influenced by patient–physician communication. Greater discussion of transitions to end-of-life care has been shown to correlate with significantly lower odds of intensive care unit admission, ventilator use, and attempted resuscitation, while promoting patient acceptance of terminal illness, caregiver quality of life, and reduced feelings of regret [11]. Why then do these discussions take place so infrequently or so late in the trajectory of illness [12, 13]? As a practicing oncologist who trains oncology fellows, Dr. Anthony Back of the University of Washington explained that oncologists should not expect the communication skills needed for these discussions to come easily. When oncologists practice these communication skills, however, improvements can be dramatic.

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Through standardized encounters assessed by blinded coding, Dr. Back has been able to show that a cohort of oncology fellows was better able to assess patient perceptions, make empathic statements while delivering bad news, elicit patients' reactions, and summarize a follow-up plan after 4 days of training. On average, the fellows acquired 10 new communication skills for delivering bad news or end-of-life discussions as a result of the brief training [14]. "Communication is clinical work that has to be learned," Dr. Back said.

In clinical discussions with patients who have advanced cancer, oncologists take care to preserve the hope patients rely on to face their illness with resolve. Robert Erwin of the Marti Nelson Cancer Foundation, an organization that works to expand access to cancer therapies, agreed that hope is vital to cancer patients, but he was careful to point out that not all hope is equal.

"In all of this, of course, is the value of hope, and realistic hope in particular," he said, "But what is realistic?" Realistic hope, he explained, is not served by continued treatment if there is little chance of benefit, even if the only alternative is palliation. Mr. Erwin continued, "There is value in knowing that a person has done everything that is reasonable to do. . . . Satisfying the need to feel that enough has been done is important. . . . There is certainly value in simplifying the choices and getting rid of unrealistic treatment options."

Forgoing treatment options with little chance of benefit is often difficult for patients and clinicians, explained Diane Blum of Cancer Care. Even the language used in our culture to describe cancer treatment—a patient's "battle with cancer," the "war against cancer," or an oncologist's "arsenal" of cancer treatments—glorifies a struggle for even the smallest chance of cure, making anything less than the most exhaustive effort, financial or otherwise, seem undignified. This sense is reinforced in the medical culture with language like "this patient failed treatment." In fact, the opposite is true—patients do not fail treatments, it is the treatments that fail patients.

Oncologists themselves are not immune to feeling a sense of failure when their treatments do not work, which may lead some oncologists to focus too heavily on anticancer treatment outcomes while overlooking the other immense benefits they can provide to patients. Mary McCabe, Director of Memorial Sloan-Kettering's Cancer Survivorship Program, expressed concern over the language that many clinicians use with patients when active anticancer treatment is no longer an option. Rather than feeling empowered to foster realistic hope for maintaining patient quality of life through comfort care, some clinicians may say instead, "There is nothing more we can do." Although there is much more that clinicians can do for advanced cancer patients, the dynamics of a clinical relationship built upon the promise of potential cure and a culture that encourages patients to fight to the bitter end can drive the use of less effective treatments at great expense, as opposed to more appropriate palliative or hospice care. The result is of little value to patients or clinicians.

Dr. Tom Smith, an oncologist at Virginia-Commonwealth University's Massey Cancer Center, understands the pressures oncologists face to simply give chemotherapy to please the family and patient and give them some hope, rather than fighting the uphill battle to place the patient in hospice care. He said.

"It is a lot easier and less angst producing to just give fourth-line chemotherapy than to sit with a 63-year-old guy with mesothelioma, as I did last Wednesday, and say 'Your performance status is four,' which he doesn't understand, 'but you are in bed or the chair all the time. You are very short of breath. I know you desperately want to live longer, but there's no chemotherapy that has been shown in any randomized controlled trial . . . that is going to make you live longer or better. It would be different if you were much healthier.' He is in tears. His wife is in tears. Three sons in the background are saying, 'Well, that's not what we read about on the Internet.' Where is the reward for that? There isn't one except maybe doing a good job."

It is challenging to take care of advanced cancer patients, and no one likes to deliver bad news about health. Add to that bad financial news and it becomes even more difficult, especially in cancer care, where it may feel inappropriate to bring up costs in the context of a patient's life-threatening illness. Nevertheless, patient concerns over costs are common and need to be addressed. Dr. Deborah Schrag of the Dana Farber Cancer Institute found, in one survey, that a significant proportion of cancer patients (>40%) were worried to some degree about the costs of treatment, but the vast majority of these patients had not discussed costs with their doctor (data from IOM presentation). Although patients do discuss cost concerns with their family members, nurses, and social workers, patients may feel less comfortable broaching this topic with their physicians. Physicians, therefore, can help put patients at ease by addressing cost worries head on using the communication strategies at their disposal, including those designed specifically for discussions of treatment costs [15].

Evidence for Value

The amount of evidence available to clinicians in the medical literature is staggering, with roughly 18,000 randomized controlled trials published annually. In cancer care, a similar abundance of randomized trials performed for FDA

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approval is perhaps the best data resource for clinical decision making available, but the information these carefully controlled trials provide may not always translate into effectiveness in real-world practice.

Dr. Lee Newcomer of United Healthcare described how treatments with good efficacy in controlled trials can have much less effectiveness once put into practice in the community where patients do not always meet strict eligibility criteria and treatment schedules cannot always conform to those of the clinical trial. He explained that clinicians' inexperience using new treatments can lead to treatment errors and lower effectiveness than in the treatment's clinical trial data [16]. Even after clinicians have considerable experience using a drug, off-label uses without sufficient supporting evidence can reduce its effectiveness [17], and its value.

Dr. Daniel Sargent, biostatistician at the Mayo Clinic, said that clear standards to judge treatment effectiveness are lacking, collection of data is disorganized, and the real-world indications do not perfectly match the limited scope of a treatment's controlled trials. Strategies to build evidence for real-world effectiveness are underused, he said. These could include the use of large, multicenter simple trials with minimal eligibility criteria [18, 19]. Alternatively, if a randomized design is needed to determine effectiveness but randomization of individual patients is prohibitively costly or cumbersome, health care institutions or practices may be randomized to different interventions—so called cluster randomization—to examine treatment effectiveness. Though large, simple trials and cluster randomization cannot replace the gold standard randomized clinical trial evidence, their results are no less valid and may be more useful to community physicians whose practices cannot operate under such stringent conditions as those found in randomized, controlled trials.

Although the diffusion of a treatment into new practice settings can create significant uncertainty around its clinical benefit, Sean Tunis of the Center for Medical Technology Policy explained that payers' coverage of a new treatment can create a significant disincentive against further clinical trials. In this way, the reimbursement system stalls evidence generation for new medical technologies and does little to reduce uncertainty around their clinical benefits. One solution is for payers to cover a new technology contingent upon ongoing data collection for that technology through registries or clinical studies selected by the payers, who can later use these long-term data to decide whether a treatment merits continued coverage.

To fully assess a treatment's value, practicing oncologists need to know not only the treatment's effectiveness but also its cost-effectiveness. Cost-effectiveness analyses can have significant implications for treatment value. To illustrate this point, Dr. Schrag cited a cost-effectiveness study performed by Nelson et al. [20], comparing open and laparoscopic-assisted colectomy for resectable colon cancer. The authors' careful analysis found that the more cost-effective treatment differed depending on whether their calculations were based on unit costs of academic centers or those of community hospitals. Though the laparoscopic procedure meant fewer patient postoperative inpatient days, the procedure required more operating room time and incurred greater operating room costs (personnel and equipment). Because the costs of operating room professionals were greater for most community hospitals than for academic centers and costs per hospital day were less, the incremental cost of laparoscopic-assisted colectomy in the community hospital setting was much higher than the cost of open colectomy. For academic centers, however, the laparoscopic procedure was much more cost-effective and a better value.

Better evidence—evidence that holds up in everyday practice and helps clinicians weigh treatment costs—is critical for improving value in cancer care, but better evidence alone is not enough. To ensure that the best available evidence reaches patients and clinicians, many at the symposium agreed that clinical treatment guidelines and patient decision aids play a critical role as well, especially for advanced stage cancer, for which standard therapeutic approaches may not be established and treatment approaches can vary. The combination of better evidence of effectiveness and cost, readily available guidelines, and a clinical workforce to deliver evidence-based medicine would together significantly improve value in cancer care.

What Value Means in Cancer Care

In the final discussion of the IOM symposium, Dr. Scott Ramsey, faculty member at the Fred Hutchinson Cancer Research Center and chair of the symposium planning committee, invited the speakers and audience of attendees to consider how they would define value in cancer care. What attributes or domains should value in cancer care embody? The suggestions that emerged from that discussion included those domains of value listed in Table 1. Outcome domains such as overall survival, surrogate endpoints, quality of life, and adverse events were included to address efficacy, effectiveness, and safety. Care domains (access, quality, communication, and equity) and patient-centered domains (compassion, respect, opportunity for treatment benefit, patient choice, and hope) were included as important components of value in cancer care. Finally, the symposium attendees agreed that cost should certainly be a domain that factors into the description of value, and not a single objection was voiced to inclusion of cost in the description of value.

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Table 1. Domains of value

Outcome domains
Survival or duration of life
Quality of life
Adverse events
Time to progression
Tumor response
Cost
Care domains
Access to care
Quality of care
Communication
Social equity
Patient-centered domains
Compassion
Respect
Opportunity for treatment benefit
Choice
Hope
Innovation and future discovery

To identify metrics that could be used to measure these domains of value, Dr. Ramsey again queried the group's collective wisdom. Cost per QALY was readily accepted by the group as an economic metric of value. In addition, participants included measures of quality including coordination of care, measures of equity (variations in care, disparities, workforce shortages, and differences in access to appropriate services), and measures of innovation (willingness to pay for cancer research, new FDA drug applications, and the number of generic treatments or biosimilars). The symposium participants expected that these domains and metrics together would provide a clearer understanding of what value means in cancer care and how it can be assessed to patients, providers, payers, and policymakers in oncology interested in increasing value. Armed with a clearer understanding of value in cancer care, the next step is to begin to implement solutions that promote this vision.

Conclusion

The explosion of high-cost innovation in oncology has provoked a greater, shared need to correct misaligned economic incentives, improve clinical communication, and foster evidence to address and promote value in cancer care. This need for improved value is not new, but the mounting challenges to value in cancer care have made implementing solutions all the more urgent. At the end of a thought-provoking presentation on the last day of the IOM symposium on value in cancer care, Dr. Neil Wenger, Director of the UCLA Healthcare Ethics Center, closed by considering the potential those in oncology have to shape the field for greater value.

He asked, "What if oncology's role in guiding and providing care Americans need was to delineate fair and appropriate costs for cancer care resources at the policy level? Or leading a social exploration of when resource-based rules might be suspended for rescue? Or demanding that the structure of routine care yield data to improve treatment and explain the shortcomings of current standard approaches?"

After 2 days of discussion during the IOM symposium to describe and examine value, identify its challenges, and develop promising solutions, it was clear that there was much that could be done. The next steps not only require that the discussion of value be continued and expanded, they require concrete action to reduce costs and improve quality for greater value in oncology.

A full report on the IOM symposium is available through the National Academies website (http://www.iom.edu/Reports/2009/Assessing-Improving-Value-Cancer-Care.aspx for free online viewing or to order printed copies).

Strive not to be a success, but rather to be of value. —*Albert Einstein*

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Adam Schickedanz is formerly Mirzayan Science and Technology Fellow at the Institute of Medicine, National Academies of Science, Washington, DC, USA.

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