PERSPECTIVE

The VALUE Framework: Training Residents to Provide Value-Based Care for their Patients

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National efforts to improve the value of health care must include graduate medical education (GME) if they are to succeed. Proposals to teach residents to provide value-based care have come from the Medicare Payment Advisory Commission (MedPAC), the Accreditation Council for Graduate Medical Education (ACGME) and the American College of Physicians (ACP). Such proposals skip a key step: residency programs currently lack a clear strategy to prepare residents to assess and deliver value-based care. In this article, we present the VALUE Framework for programs to utilize to teach residents to assess and deliver value-based care for their patients. We then present more than 20 opportunities for residency programs to incorporate training in value-based care.

KEY WORDS: medical education; residency training; graduate medical education; value; health care value; value-based care.

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INTRODUCTION

National efforts to improve the value of health care must include graduate medical education (GME) if they are to succeed.¹ Accordingly, in 2010 the Medicare Payment Advisory Commission (MedPAC) proposed to reallocate over one-third of the current \$9.5 billion of Medicare funding towards GME as performance-based payments, rewarding residency programs that educate physicians on the basis of the following: integration of community-based care with inpatient care, practice-based learning and improvement, and systems-based practice.^{1,2} In addition, it has recently been proposed that providing high-value, cost-conscious care become a new core competency for training physicians.³ Such proposals skip a key step: residency programs currently lack a clear strategy to prepare residents to assess and deliver value-based care.

The task of training physicians about value is akin to learning an entirely new language for teachers and learners alike. In a national survey, less than half of graduating U.S. medical students felt appropriately trained in topics such as health care systems and medical economics.⁴ In our prior work, we have described the complex historical and cultural reasons why these gaps in medical education exist.⁵ Thus far the conventional wisdom has been that time spent teaching these concepts would detract from other curricular clinical components; evidence now suggests otherwise.⁴ Teaching these concepts requires a multi-disciplinary faculty not abundantly available at many institutions, and there is a general lack of research on best methods for curricular development in this area.⁵ Under these circumstances, it will be challenging to train residents to implement new approaches to value-based care building on concepts such as comparative-effectiveness research.⁶ Ideally, prior studies of content development and assessment methodology would be reviewed to establish a core curriculum. Unfortunately, there is a paucity of research on evaluating methods to teach these concepts.⁵ Therefore, medical educators have no guidance on how to redesign residency curriculums.

Recently, we proposed standards for a national curriculum in health policy for medical schools to begin training future physicians in the foundations of these topics.⁵ The curriculum focuses on four domains: systems and principles, quality and safety, value and equity, politics and law. As medical schools look for opportunities to adapt their health systems and policy curricula, teaching hospitals similarly need a strategy to improve GME in this realm.

In this article, we present the VALUE Framework for programs to utilize to teach residents to assess and deliver value-based care for their patients. We then present more than twenty opportunities for residency programs to incorporate training in value-based care. The VALUE Framework is aligned with all six general competencies set forth by the Accreditation Council for Graduate Medical Education⁷ and with the proposed 7th competency of providing high-value, cost-conscious care.³

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What is Health Care Value?

Health care value, defined as the health outcomes achieved per dollars spent, has become a cornerstone of the strategy to restructure the U.S. health care system.^{8–11} An essential component of the value definition is that, while it incorporates cost, it is not only about cost. Comparative-effectiveness research has arisen as a tool for helping clinicians to assess the value of medical interventions.^{6,9} However, physicians and trainees alike have long struggled with applying policies developed for populations to their assessment and care of individual patients.¹²

The VALUE Framework

In Table 1, we present a framework for a resident to assess whether a medical intervention will provide value for his or her patient. Case examples demonstrate opportunities for

Table 1. A Framework for Residents to Assess Value from a Medical Intervention for their Patients

The VALUE framework		Case examples
V	Validation and Variability	Pick one patient a week that is considering a medical intervention and compare at least two published studies regarding the validation of study measures and the variability of their application across study populations. Residents then discuss with the group how their findings relate to the patient
A	Affordability and Access	Ask each patient how they pay for their medical care and medications. Ask uninsured patients how they are finding opportunities to seek medical attention when needed. Ask all patients who express concerns about affordability and access if they are willing to meet with a social worker to understand options for support
L	Long-term and Less side effects	When discussing care options with patients in the outpatient setting, always discuss short-term and long-term effects of an intervention, including side effects. Discuss continuing current management without intervention as an option
U	Utility and Usability	Regularly ask patients about their recent and past health status to better understand trends over time. When evaluating an intervention discuss the usability (e.g. ease of use, frequency, affect on patient's daily living) and the impact on a patient's utility (e.g. potential to improve their health status). A simple example might be to discuss the use and frequency of daily finger stick blood sugar measurements for a diabetic patient
E	Effectiveness and Errors	Utilize evidence-based clinical guidelines (e.g. U.S. Preventive Services Task Force) when evaluating the effectiveness of screening tests. Health systems can also encourage residents to report errors and be involved in quality improvement initiatives

residents to practice and learn these principles. Residency programs can utilize this framework to implement initiatives to incorporate concepts of value-based care. In the following sections, we expand upon the components of this proposed framework, which forms the mnemonic VALUE.

Validation and Variability

The initial step for a resident to evaluate whether a medical intervention will provide value for a patient is to determine if it has been validated through evidence-based medicine from rigorous research trials or if it has been used despite weaker evidence. This requires discussion of various research methodologies and their levels of rigor, along with translation of statistical significance to clinical significance. This could be taught during journal club or teaching rounds, within the context of clinical questions. Residents must understand the terminology and validity of not only randomized control trials but also of other reported results, such as associations found among cohort studies or odds ratios from case-control studies.

Understanding variability is of utmost importance when attempting to apply the outcomes of population-based research to individual patients. Certain medications may be very effective in a specific cohort, but individual differences in age, ethnicity, comorbidities or behavior can greatly affect the benefits of an intervention. It is also important to recognize the variability of diagnostic tests, interventions and outcome measures. For example, lab variation in reporting of the hemoglobin A1c delayed its adoption as appropriate screening for diabetes by several years.¹³ Considering subtle, yet identifiable variability between individuals or outcomes in tests and diagnostics can lead to dramatic differences in achievable value from a medical intervention.

Affordability and Access

Health care varies tremendously in terms of the cost per intervention, and patients vary in their ability to afford health care. Health insurance coverage plays a pivotal role in determining affordability, but at times interventions are not covered by payers or require special authorization. Moreover, a significant proportion of the U.S. population lacks health insurance. Evaluating whether a medical intervention is affordable for a patient is important for two reasons. First, patients are more likely to adhere to interventions that are less expensive, such as when generic medications are compared to brand names.¹⁴ Second, no care translates into no value for the patient. Teaching residents how to best identify resources or alternative treatments can lead to improved value for patients—including in situations when not intervening may provide the most value of all. An example of reducing medication

cost beyond using generics is the use of pill-splitting, which has been shown to potentially save patients thousands of dollars per year.¹⁵

Limited access to medical care can create barriers to maximizing value from a medical intervention.¹⁶ Residents who can better identify practice settings or patient populations at risk for limited access to care have been found to be better prepared to provide appropriate counseling to patients.¹⁷ Providing equitable care to all patients has been a primary goal of health care systems in the U.S. Yet, health disparities still exist and are an important consideration when evaluating a patient. By identifying patients with limited access to care, proper resources can be utilized to address barriers that may limit value-based care.¹⁶

Long-Term and Less Side Effects

When evaluating a patient, residents should remember to consider the long-term horizon to recognize medical interventions that might lead to lasting benefits. For example, when evaluating a patient with multiple medical problems in the outpatient setting, identifying opportunities for prevention such as age-appropriate cancer screening can produce meaningful value to patients over time. Despite national guidelines for preventive care and screening, the U.S population has yet to fully utilize their potential long lasting benefits.¹⁸

Side effects from interventions such as medications can impact adherence and sometimes worsen a patient's quality of life. Side effects differ from adverse events in that they are known and predicted consequences of medication or intervention. Adverse events, in contrast, are rare and often unforeseen. Both side effects and adverse events can be either minor or more serious. However, side effects are often known at time of medical decision making and should play a role in determining which intervention has a lower likelihood of side effects and might provide more value.

Utility and Usability

The balance between utility and usability is important when considering whether an intervention will provide value. Medical utility refers to the desirability of a health outcome.¹² It can reflect the patient's preferences before and after an intervention. The amount of utility obtained from conducting an intervention should be considered for each individual patient. A test that might offer more information but ultimately does not improve the quality of life of a patient should be reconsidered.

Usability refers to the patient's willingness and ability to adhere to the intervention. For example, reviews of various drug dosing regimens and associated adherence finds that less frequent dosing (e.g. daily rather than three times a day) is associated with improved adherence across multiple

therapeutic classes.¹⁹ Indeed, these effects translate into improved clinical outcomes and value for patients. A study among HIV patients found that improved medication adherence was strongly predictive of undetectable viral load within six months of initiating therapy.²⁰

Effectiveness and Errors

Interventions that work within controlled settings are defined as efficacious. However, efficacy does not always translate into similar effective outcomes in real-world settings. When reviewing published studies on medical interventions, one must carefully evaluate whether the outcomes were shown to be effective and apply to the patient since many differences between efficacy and effectiveness are due to variations in patient populations or differences in settings.

Medical errors and adverse events are a risk with all interventions. However, the likelihood of errors or adverse events as well as their associated consequences can vary tremendously. An invasive procedure such as central line placement could lead to a pneumothorax. However, if the patient is decompensating from septic shock, then the benefits from establishing central venous access may outweigh the risks. Certain identifiable patient-specific circumstances such as anticoagulation (e.g. fall risk, alcohol intake, age, etc.) should be evaluated as well. Ultimately all interventions carry some risk of error; however, their likelihood and consequences must be weighed against the potential effectiveness of the intervention to determine whether it might create value for the patient.

Incorporating Value-Based Care into Residency Training

Resident training is much akin to an apprenticeship where learning occurs concurrently with providing care for patients. Our own experiences with teaching concepts of value-based care have been well received in the context of patient-based discussions. However, to achieve a more meaningful impact, a systematic approach must be taken to match fundamental training in value-based care to the teaching dynamics within residency programs. The process of teaching residents involves several stages in various clinical and non-clinical settings.²¹ Structured teaching is conducted through conferences, simulations, and journal clubs while clinical teaching occurs during rounds and at the patient's bedside. Measurement and evaluation of resident performance is primarily based on attending and peer evaluations that are supplemented with scores from in-training exams and online modules.²² The learning process becomes iterative through feedback from program directors, attendings, and peers.

In Table 2, we provide specific recommendations for residency programs to incorporate concepts of value-based

Table 2. Opportunities for Residency Programs to Incorporate Training in Value-Based Care

Stage	Component	Incorporating concepts of value-based care
Structured teaching	Orientation and basic systems training	Inform residents of opportunities to help guide their assessment of value-based care when orienting them to the health system, providing basic computer training, and discussing available electronic and library resources
	Inpatient reports/conferences	Discussion of recent clinical cases should include prompts for residents to evaluate whether or not interventions provided value for the patient
	Outpatient reports/conferences	Compare the potential value of preventive care (e.g. cancer screening) versus costly interventions when reviewing clinical guidelines and best practices
	Journal Club	Review of published studies should focus on how validation for an intervention was determined and an assessment of whether variation exists among various patient populations. Residents should discuss how these concepts are important for creating value for the patient and how study design might limit the translations from statistical significance to clinical significance
	Quality improvement curriculum	An ACGME requirement for residency programs that could be leveraged to provide structured teaching in core concepts of value-based care and their overlap with improving health care quality
Clinical teaching	Online training modules	Advances in computer simulation and mobile technology provide platforms for creating online modules that provide an interactive method of demonstrating how concepts of value affect patient care
	Grand rounds (e.g. Morbidity and mortality)	These patient cases are often presented to the entire department and help set the path towards changes in health system practices. Incorporating a review of when value was added or opportunities were missed might help to integrate these concepts into system redesign
	Attending teaching rounds	As one of the cornerstones of clinical teaching during residency training, this provides an opportunity for the attending to demonstrate the importance of considering value when making management decisions. Attending physicians should be trained to teach and discuss these concepts for every patient
	Bedside interactions with patients	Residents learn much of their lifelong practice habits during clinical interactions with patients in residency. They should be required to consider and discuss concepts of value with the patient. For example, when obtaining patient consent for a procedure, residents should incorporate concepts of value into the discussion of risks and benefits of the procedure
	Staffing a patient	Whether in the inpatient or outpatient setting, residents often see the patient first and then present or “staff” a patient with an attending. Their assessment and plan should highlight how their recommendations for care provide or do not provide value to the patient
Measurement / evaluation	Social work issues	Often barriers to care that involve affordability or access are passed on to social workers. Integrating residents into this process, such as mandating daily attendance at social work rounds, helps them to understand the importance of evaluating and addressing these issues
	Discharge planning	Transitions in care provide opportunities for residents to review medical management thus far and to determine prioritization of future patient care. Residents should be required to utilize concepts of value to help identify which interventions provide the most value to the patient and how to best reduce the chances of medical error or long-term side effects
	Attending evaluations	Evaluations of resident performance should include a section on whether the resident demonstrated integration of concepts from value-based care. Attendings might offer the best perspective on evaluating the resident’s high-level management of patient care
	Senior resident evaluations	Senior residents are most involved with more junior residents’ decisions regarding medical interventions. They offer the best perspective on evaluating the junior resident’s day-to-day management of patient care
	Trainee evaluations	Residents are expected not only to learn about concepts of patient care, but also to teach these concepts to more junior residents and medical students. Trainees sometimes provide the only evaluations of resident performance in teaching. Therefore, trainees, both junior residents and medical students, should evaluate their resident’s performance in teaching concepts of value in patient care
Feedback	Online evaluation modules	As mentioned above, computer simulation and mobile technology have created a platform for use of online modules to teaching concepts of patient care. A powerful component of these modules is the ability to evaluate residents while using the modules. These performance scores can be reviewed immediately after the module by residents and can be used by the resident program to evaluate whether changes in residency training are impacting training in these topics
	In-training examinations	Many residency programs use these exams to help residents gauge their knowledge and preparation for board examinations. While the actual test is often from a centralized organization, this timepoint provides an opportunity for the resident program to administer a supplemental questionnaire or evaluation focused on topics that reflect changes in the program’s training
	Board examinations	There are certification exams that residents take after completion of residency. While the residency program does not have control over these, they do often offer board preparation sessions. As board certification exams change to reflect concepts in value, residency programs can integrate teaching on these concepts during preparation sessions
	Program director	A discussion regarding a resident’s overall performance during residency is often only conducted during the meeting with the residency program director. Based on the evaluation and measurement methods above, the Program Director can provide feedback on a resident’s ability to incorporate concepts of value into patient care
	Attending/senior resident	At the end of a rotation, the attending and senior resident provides feedback on the resident’s clinical performance as well as their performance in other areas such as communication, professionalism, and time management. There should be a requirement for feedback on the resident’s ability to assess and provide value-based care
Feedback	Data-driven report cards	Price transparency and resource utilization are two areas that have received attention as opportunities to help improve health care value. While the application of each of these needs further study within the clinical realm, they offer a powerful objective indicator of how the resident is providing value-based care

care into structured teaching, clinical teaching, measurement and evaluation, and feedback. Over time, concepts of value-based care must be integrated into all facets of graduate medical education to have a meaningful impact on patient care. As measurement and evaluation of resident performance in this area will be vital for determining whether program initiatives have been successful, further research is necessary to better understand the proper methods for these stages of teaching.

CONCLUSIONS

National efforts to improve value-based care must include graduate medical education if they are to succeed. Residency programs currently lack a clear strategy to prepare young physicians for this important task. The VALUE Framework provides a simple and concise method for residents to assess whether an intervention might create value for their patients. Opportunities for residency programs to utilize and test this framework within structured and clinical teaching, measurement, evaluation, and feedback might lead to further improvements in training residents to provide value-based care.

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REFERENCES

1. Hackbarth G, Boccuti C. Transforming graduate medical education to improve health care value. *N Engl J Med*. 2011;364(8):693–5.
2. Iglehart JK. Health reform, primary care, and graduate medical education. *N Engl J Med*. 2010;2010(363):584–90.
3. Weinberger SE. Providing high-value, cost-conscious care: a critical seventh general competency for physicians. *Ann Intern Med*. 2011;155:386–8.
4. Patel MS, Lypson ML, Davis MM. Medical student perceptions of education in health care systems. *Acad Med*. 2009;84:1301–6.
5. Patel MS, Davis MM, Lypson ML. Advancing medical education by teaching health policy. *N Engl J Med*. 2011;364(8):695–7.
6. Rich EC, Bonham AC, Kirch DG. The implications of comparative effectiveness research for academic medicine. *Acad Med*. 2011;86:684–8.
7. Accreditation Council of Graduate Medical Education. ACGME Program Requirements for Graduate Medical Education in Internal Medicine. Available online at: http://www.acgme.org/acWebsite/downloads/RRC_progReq/140_internal_medicine_07012009.pdf. Accessed July 31, 2011.
8. Porter M. A strategy for health care reform – toward a value-based system. *N Engl J Med*. 2009;361(2):109–12.
9. Owens DK, Qaseem A, Chou R, Shekell P. High-value, cost-conscious health care: concepts for clinicians to evaluate the benefits, harms, and costs of medical interventions. *Ann Intern Med*. 2011;154:174–80.
10. Porter M. What is value in health care? *N Engl J Med*. 2010;363(26):2477–81.
11. Lee T. Put the value framework to work. *N Engl J Med*. 2010;363(26):2481–3.
12. Asch DA, Hershey JC. Why some health policies don't make sense at the bedside. *Ann Intern Med*. 1995;122:846–50.
13. Mitka M. Hemoglobin A1c poised to become preferred test for diagnosing diabetes. *J Am Med Assoc*. 2009;301(15):1528.
14. Chernew ME, Shah MR, Wegh A, Rosenberg SN, Juster IA, Rosen AB, et al. Impact of decreasing copayments on medication adherence within a disease management environment. *Health Aff*. 2008;27(1):103–12.
15. Stafford RS, Radley DC. The potential of pill splitting to achieve cost savings. *Am J Manag Care*. 2002;8:706–12.
16. Smedley BD, Stith AY, Nelson AR, et al. Unequal Treatment: confronting Racial and Ethnic Disparities in Health Care. Washington: National Academy Press; 2002.
17. Weissman JS, Campbell EG, Gokhale M, Blumenthal D. Residents' preferences and preparation for caring for underserved populations. *J Urban Health*. 2001;78(3):535–49.
18. McGlynn EA, Asch SM, Adams J, Keesey J, Hicks J, DeCristofaro A, et al. The quality of health care delivered to adults in the United States. *N Engl J Med*. 2003;348:2635–45.
19. Claxton AJ, Cramer J, Pierce C. A systematic review of the associations between dose regimens and medication compliance. *Clin Ther*. 2001;23(6):1296–310.
20. Liu H, Golin CE, Miller LG, Hays RD, Beck CK, Sanandaji S, et al. A comparison study of multiple measures of adherence to HIV protease inhibitors. *Ann Intern Med*. 2001;134(10):968–77.
21. Shankel SW, Mazzaferri EL. Teaching the resident in internal medicine: present practices and suggestions for the future. *J Am Med Assoc*. 1986;256(6):725–9.
22. Epstein RM. Assessment in medical education. *N Engl J Med*. 2007;356:387–96.