Making the Case to Improve Quality and Reduce Costs in Pediatric Health Care

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KEYWORDS

• Quality improvement • Health care costs • Pediatrics
• Value in health care • Legal implications of quality movement

The United States health care system is in the midst of a crisis in terms of both quality and costs. The need to implement quality improvement strategies is critical for several reasons. First, there are unwarranted variations in health care delivery with patients receiving different amounts of health care for the same clinical situation without measurable differences in outcomes.[1] Not only is there variation in health care delivery, but only about half of the time do adults and children receive recommended care.[2,3] This unwarranted variation and underuse of effective care can in large part be improved by physicians, and underscores the professional obligation of physicians and pediatric institutions to ensure that quality improvement strategies are in place. Second, there is a growing amount of concern about patient safety. A recent study found that among 1000 children in 12 independent children's hospitals, 1 in 15 children was exposed to wrong medications, side effects, or drug interactions.[4] Patient safety an integral component of quality, is included as one of the six dimensions of quality proposed by the Institute of Medicine (IOM).[5] Third, the cost of health care in the United States is high and is continuing to escalate. Despite this, there are major gaps in the quality of health care. These gaps are also present in pediatric health care delivery. Finally, there is growing dissatisfaction in health care among patients, providers, and payers. Improving health care quality is the right thing to do for children. It is timely, and pediatricians must take an affirmative role in getting engaged and leading the quality movement.

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WHAT IS QUALITY?

The IOM has defined quality in health care as "the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge."[6] Further, the IOM has proposed six dimensions of quality in health care.[5] **Fig. 1** illustrates these six dimensions and how they can be put into operation. While outcomes and patient safety are traditional elements of quality, "nonclinical" attributes, such as efficiency and access, are also elements of quality.

Another important concept in quality is the "structure-process-outcome" model proposed by Donabedian.[7,8] Structure in health care relates to the various organizational aspects for health care delivery in the outpatient and inpatient settings.[8] Electronic health records and registries are examples of the structure aspect of this model.[8] Process relates to physician-patient interaction.[8] An asthma management plan provided to the family is an example of the process aspect.[8] Outcome relates to the final outcome after health care is delivered.[8] Outcome measures can be objective or subjective.[9] In the acute care setting, an objective outcome measure may be survival (eg, infant mortality rate or risk-adjusted survival in intensive care units) or, increasingly, functional status.[9] Subjective outcome measures may include health-related quality-of-life measures and patient-satisfaction indicators.[9]

THE CHANGING APPROACH TO QUALITY

Historically, efforts for improving quality focused on "quality *assurance*" (**Fig. 2**). The goal was to minimize "defects" as measured by audits. Although quality assurance still has a role and can be used to address quality issues, there has been a paradigm shift toward "quality *improvement*." Quality improvement focuses on moving the entire performance curve forward toward a greater level of performance by adopting best practices, instead of simply focusing on low performers.[10] "Quality science," along with electronic health records, can help spread and sustain improvements.

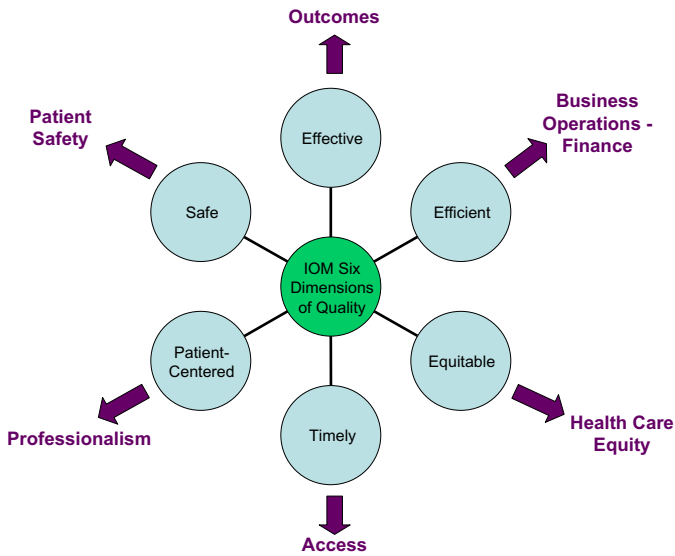


Fig. 1. Putting the six dimensions of quality into operation.

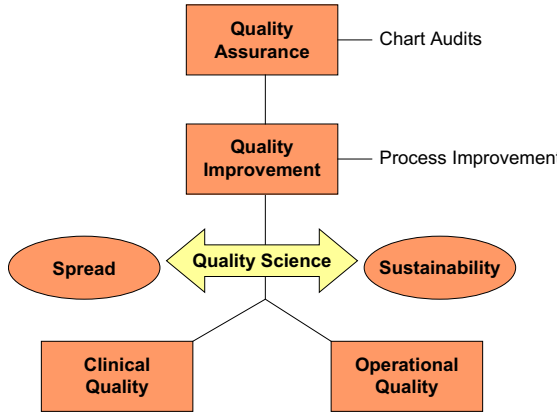


Fig. 2. The changing paradigm of quality.

Finally, quality improvement efforts can have a clinical and operational perspective. Most physicians view improvements in quality as improvements in their clinical practice. Another aspect of quality is "operational quality," which focuses on systems improvement and can result in significant enhancements in efficiencies of health care delivery systems. The concept of operational quality is aligned with IOM's quality dimension of efficiency, and can reduce waste. Methodologies, such as the Toyota Production System, Lean, and Six Sigma, which are frequently used in non–health care settings, have significant potential for improving operational quality in office-based practices and in inpatient hospital settings.[11]

Another aspect of enhancing operational quality relates to the use of management science, which provides a quantitative and scientifically robust approach for planning. Management science, which stems from the field of operations research, has been successfully used in non–health care settings, such as airlines, banking, and the defense sector.[12] Examples of its use in health care include planning for hospital expansion to ensure optimal capacity, planning ambulance services to improve efficiencies, and managing capacity and patient flow in emergency departments and in ambulatory clinic settings.[13–16] Management science has been successfully used in many European health care settings, including those in the United Kingdom, and is gaining popularity in the United States.[17] Improvement methodologies, such as Six Sigma and Lean, focus primarily on improving operational quality of existing systems and tend to be more "reactive" in nature. Management science provides a unique perspective to build better systems and is more "proactive" in nature. It has the potential to minimize processes that lead to creation of waste in health care systems. Ultimately, a multifaceted approach that combines both proactive and reactive methodologies (eg, management science, the Model for Improvement, Six Sigma, and Lean) needs to be tailored for the particular clinical setting to optimize quality improvement. These quality improvement methodologies for application in health care build on the strong foundation of quality principles developed in other industries (**Box 1**).

THE CASE FOR REDUCING HEALTH CARE COSTS

Health care today costs too much, covers too few, and isn't as good as we like to think it is. In recent years, there has been a lot of emphasis on improving health care quality, but little or no success in addressing health care costs. Part of this disconnect stems

Box 1
Quality principles from industry

Deming

Deming's Fourteen Steps has been successfully used in many industries.

Shewhart

Development of principles related to the modern approach of statistical process control, focusing on variations, and provides the underlying basis for continuous quality improvement and the Shewhart Cycle: Plan, Do, Study, Act.

Juran

Focuses on the concept of quality as the "fitness for use."

Crosby

Focuses on the philosophy of the concept that quality is free and aims to achieve "zero defects."

Data from Vonderheide-Liem DN, Pate B. Total quality management. In: Applying quality methodologies to improve healthcare. Marblehead (MA): HCPro, Inc; 2004.

from the unsatisfactory experience with cost containment efforts of managed care in the 1990s. However, the rapid and unrelenting rise in health care costs, whether measured in absolute dollars, as a proportion of the gross domestic product (GDP), or as it relates to wages and inflation, makes it imperative that health care costs be urgently addressed.

Annual health care expenditure for the United States was $2.2 trillion in 2007, with per-capita health care expense at $7421, more than twice that of other industrialized nations. This constituted 16.2% of GDP.[18] The Centers for Medicare and Medicaid Services estimate that health expenditure was $2.4 trillion in 2008. Predictions are that health care spending will reach $4.4 trillion annually by 2018 and constitute a whopping 20% of GDP. Medicare threatens to become insolvent by 2019, and only by decreasing health care costs can this albatross be shaken off. Economists warn that unless we eliminate excess spending in health care and put those dollars to better use, rising health care costs will continue to threaten our long-term fiscal security.

One could justify some or all of the United States spending on health care if the quality of the resulting health care compared favorably to that in other countries. Health indicators show that this is not the case. Despite spending more per capita on health care than any other nation, numerous measures indicate that the country lags in overall health outcomes: It ranks 29th in infant mortality, 48th in life expectancy, and 19th out of 19 industrialized nations in preventable deaths.[19] Even as health care expenditures rise, the number of uninsured (46 million in 2007) and underinsured continues to grow. It is not hard to see that the United States health care system is in crisis and needs urgent fixing. We cannot afford to continue on our present course.

DRIVERS OF HEALTH CARE COSTS

Box 2 summarizes major factors contributing to high health care costs. Advances in medical technology are the number-one factor driving health care costs, chief amongst which are new imaging technologies. Technology accounts for between one and two thirds of the growth in health spending.[20,21] Industry stakeholders agree

Box 2
Factors contributing to high health care costs

- New technologies, especially those related to diagnostic imaging
- Specialty drugs
- Population health status (including increasing rates of obesity)
- Misaligned payment systems
- Emphasis on subspecialty care
- Lack of care coordination
- Insurance administrative costs
- Defensive medical practice (redundant, inappropriate, or unnecessary tests and procedures)

that improved evaluation methods are needed to accurately weigh the risks and benefits of new technologies and procedures to avoid misallocation of health care dollars.[22]

Not lagging far behind, specialty drugs account for $54 billion in drug spending with the annual cost per treated patient ranging from $10,000 to more than a $1 million.[23] By 2010, the United States specialty prescription spending is expected to reach $99 billion, as new specialty products continues to pour into the market. Aside from imaging, specialty drugs are the largest growth sector in health care and it is believed that this trend will continue to increase. New technology and specialty drugs need to be evaluated from an effectiveness standpoint to determine if the investments result in improved quality.

Finally, and most importantly, current incentives in the United States health care system focus health care services on acutely ill patients requiring episodic care, rather than on programs for preventing illness. Across all age groups, the proportion of the population with preventable conditions, such as obesity and chronic illnesses, is increasing. Obesity accounts for about 12% of the growth in health spending,[24,25] while a handful of preventable, chronic illnesses, such as heart disease and diabetes, account for 75% of health care costs. Pediatrics as a specialty emphasizes health maintenance and disease prevention. However, fewer than half of children receive recommended preventive care.[2] Many factors with significant direct impacts on long-term health care costs are under the control of individuals and families, and are determined by their day-to-day choices about diet, exercise, stress management, and tobacco use. There is a growing consensus that successful efforts to stem rising health care costs will necessitate a focus on consumers and their health behaviors as well as emphasis on primary, as opposed to subspecialty, care. This will entail a shift to preventing and managing chronic diseases, so patients will not need as much health care in the future. This calls for a method of macroefficiency or demand management.

MUDA: THE ROLE OF WASTE IN HEALTH CARE

Muda is a Japanese term for waste. The IOM describes waste as activities, or resources, that do not benefit patients. Waste can also be defined as costs that could have been avoided without diminishing quality. Health economists agree that at least one third of the country's spending on health care is unnecessary (see **Box 2**).[26] Some examples of *muda* include the cost of recovering from preventable events; simple inefficiency; and unnecessary diagnostics, therapeutics, and interventions with minimal added value (eg, aggressively marketed blockbuster drugs that are often no more effective or safer than existing treatments, but are certainly more expensive).

Factors that contribute to this waste and overuse include misaligned provider reimbursement systems and liability issues. Contrary to popular belief, while defensive practice does lead to some amount of unnecessary testing and treatments, medical malpractice is not a major driver of spending trends (see **Box 2**).[27] Research on the effect of defensive medicine on spending is challenging because liability risk pushes physicians in the same direction as fee-for-service payment incentives (ie, toward providing more services). Liability coverage premiums contribute to health spending, but they are not a large factor, nor are they a significant factor in the overall growth of health care spending.[28]

A major reason for the prevailing climate of waste and overuse is the current fee-for-service payment system, which encourages volume-driven, rather than value-driven, health care. Under current payment systems, physicians, hospitals, and other health care providers have strong financial incentives to deliver more services to more people with notable absence of incentives for providing better services and improving health. There is also an imbalance in payment systems such that the provision of specialty care is rewarded more than primary and preventive care (see **Box 2**). Reducing unwarranted resource use and thereby reducing costs requires changing the way we pay for care, so as to reward hospitals and physicians for providing high-quality, high-value care and for prudent stewardship of resources.

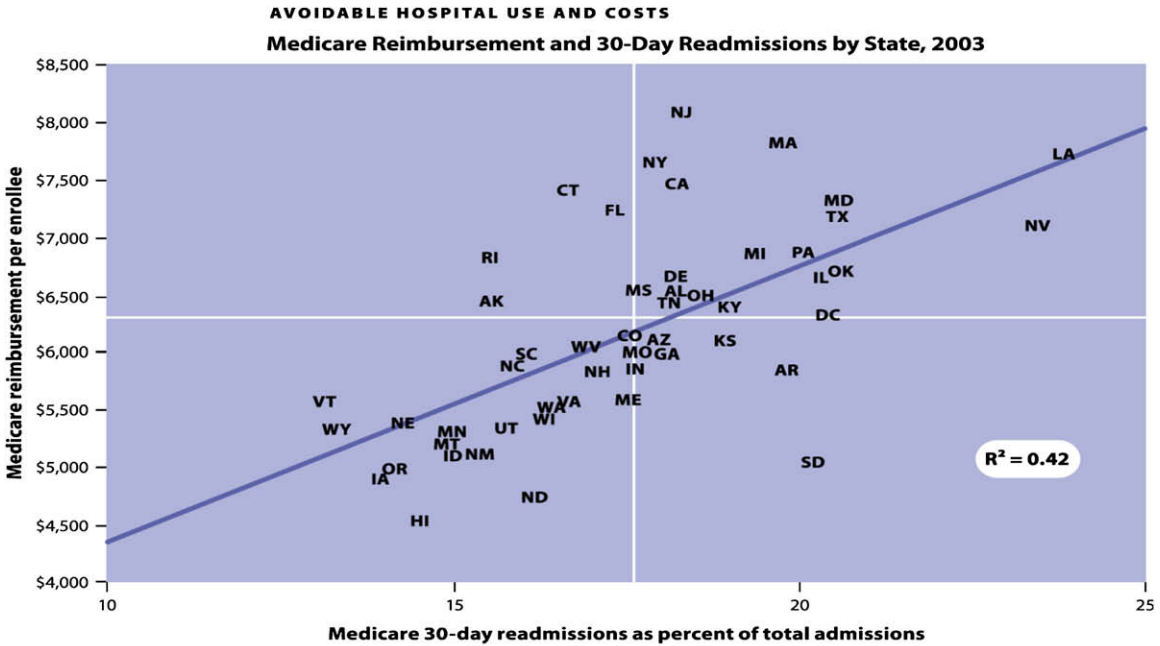
THE LINK BETWEEN QUALITY AND COST

Contrary to traditional thinking that ''quality'' means ''sparing no expense,'' pursuit of high quality can lead to substantially reduced costs. This is just as true for health care as it is for other industries. Recent research has demarcated two major areas—quality waste and inefficiency—in which high health care quality can lead to substantially lower costs.[29] Estimates suggest that health care quality waste and inefficiency waste (recovering from preventable events, unnecessary diagnostics and therapeutics, and simple inefficiency) may account for more than 50% of all American health care expenditures.[30]

A recent study by the Commonwealth Fund on health system performance ranked the 50 states in the United States by potentially avoidable hospital admissions (as the quality metric) and Medicare reimbursements (as the cost metric).[31] The study found that as quality goes up, cost goes down (**Fig. 3**).[31] Poor quality care is a major contributor to runaway health care costs. The pursuit of high quality in health care can lead to substantially lower health care costs; improving quality is a key part of making health care affordable. Efforts to rein in health care costs cannot be made in isolation; rather, they have to be made in the context of solving the broader problems of the health care system, including improving quality and access.

NATIONAL DRIVERS FOR QUALITY IMPROVEMENT

Three major national drivers are serving as catalysts for the quality movement. These will significantly affect pediatricians and their practices. The first is the Maintenance of Certification (MOC) requirements being adopted by the American Board of Pediatrics for implementation in 2010.[10,32] This is part of a larger process adopted by the American Board of Medical Specialty Boards.[33] Under these new requirements, all pediatricians and pediatric subspecialists with time-based certificates must demonstrate an understanding of quality improvement principles and how to apply such principles.[10,32] The second major driver is the changing reimbursement landscape favoring pay-for-performance (P4P), which significantly affects physician and hospital revenues. P4P relates to the concept of linking certain amounts of reimbursement for



DATA: Medicare reimbursement – 2003 Dartmouth Atlas of Health Care; Medicare readmissions – 2003 Medicare SAF 5% Inpatient Data

Fig. 3. Correlation between quality and cost based on 2003 Medicare data. Quality is shown as Medicare 30-day readmissions as percent of total admissions (avoidable hospital use). Cost is shown as Medicare reimbursement per enrollee. (*From* Commonwealth Fund State Scorecard on Health System Performance, 2007; with permission.)

physicians and hospitals to quality metrics.[34] P4P has already been implemented in Medicare in the adult clinical setting and is gradually permeating the pediatric arena. Although the long-term impact of P4P strategies remains controversial, its spread to Medicaid and other private insurers will affect reimbursement for pediatricians and pediatric health care facilities. The new policy adopted in 2008 by the Centers for Medicare and Medicaid Services (CMS) for nonpayment of "Never Events" further underscores the impact of P4P-related strategies.[35] Hospitals cannot seek reimbursement from CMS for patient care that is delivered related to any condition included in the list of Never Events (eg, serious preventable events, hospital-acquired injuries and infections). The third driver is the movement for transparency of quality, which will likely affect consumer choice. The transparency movement will result in patients, families, and payers choosing health care options that promise demonstrably better quality.[36]

Currently, several publicly available Web sites provide information regarding the quality of physician and hospital services. **Box 3** summarizes some examples of these Web sites. The value of online information sources is limited because information is not always validated and is not presented in a standardized manner. To address this concern, the National Quality Forum created a Technical Advisory Panel to develop recommendations for the public reporting of quality.[37] The move toward transparency in health care has governmental support: A 2006 executive order requires that all federally insured programs have transparency in price and quality.[38] This national direction poses some unique challenges in the pediatric clinical setting by, for example, making apparent the need to develop valid and reliable quality measures that can be easily tracked in general pediatric and subspecialty settings. The push toward P4P and transparency further underscores the urgency to establish meaningful measures in pediatrics to achieve quality goals.

FUTURE DIRECTIONS IN QUALITY IMPROVEMENT

Comparing Quality—The Need for Risk Adjustment

When evaluating the quality of health care by comparing outcomes, it is important to understand the concept of risk adjustment. Risk adjustment allows statistical adjustment of patient differences, such as severity of illness, to make comparisons of outcomes clinically meaningful.[39] This enables the translation of statistically significant tests into clinically meaningful results. Risk adjustment methods for health care outcomes are better developed in the inpatient and acute care settings as compared with the outpatient ambulatory care setting. An example of an inpatient risk adjustment system is the PRISM (Pediatric Risk of Mortality) scoring system, which has been successfully used to adjust for differences in outcomes in pediatric critical

Box 3
Examples of public reporting

- RateMD: http://www.ratemds.com
- Healthgrades: http://www.healthgrades.com/consumer
- DrScore: http://www.drscore.com
- The Joint Commission Quality Check: http://www.qualitycheck.org
- CMS hospital compare: http://www.hospitalcompare.hhs.gov
- WebMD quality services: http://www.selectqualitycare.com

care units.[40,41] Although an initial evaluation of the outcomes from these units showed that the survival from large tertiary care units was worse than that for smaller non–tertiary care units, after performing severity risk adjustment, these differences disappeared and allowed more accurate and meaningful comparisons of outcomes.[41] The science of severity risk adjustment is undergoing rapid growth with the development of new methods for risk adjustment. Although not as robust as the physiologic risk adjustment methods, such as that of the PRISM system, APR-DRGs (All Patient Refined Diagnosis Related Groups) have also been frequently used for purposes of risk stratification when comparing outcomes within patient groups in many settings.[42] Recently, Sachdeva and colleagues[43] proposed the need for the next generation of diagnosis-based physiologic risk adjustment approaches to compare outcomes. As newer risk methods are refined, it will become increasingly possible to risk adjust and compare the quality and outcomes of health care in many settings.

The Value Proposition

Many people feel that a big problem in health care is the disconnect between ''what we pay for'' and ''what we get.'' A helpful concept to understand this is *value*, which is measured as quality per unit of cost (**Fig. 4**). Value can be defined as the quality (sum of outcomes, safety, and service) achieved for the resources committed and costs incurred. High-value clinical care results from the most efficient expenditure of resources to achieve an established high level of clinical quality.

In health care, improving quality is essential but not enough; cost has to be addressed simultaneously. According to the Agency for Healthcare Research and Quality 2007 National Healthcare Quality and Disparity Report, health care quality is improving modestly, but health care spending is rising much faster, underscoring the urgency to improve the value Americans are getting for their health care dollars. In other words, the quality agenda has to put the cost of health care in the same equation to get the most benefit. A value-based national health care movement is taking shape and gaining momentum, and may be one of the cornerstones of reimbursement in the future.[44] This approach will also be relevant to the evolving concept of comparative effectiveness research, which is aimed at achieving the highest quality and greatest value from health care spending.

Whose Responsibility is Quality?

As the United States attempts to revamp health care quality, a fundamental question that arises is: Who should hold that responsibility? As discussed by Wharam and Sulmasy,[45] quality is the responsibility of several stakeholders. Historically, quality has been defined from the perspective of administrators and, more recently, clinicians. It becomes important to further expand the definition of quality to incorporate the perspective of families. Sachdeva and colleagues[46] have shown that families can successfully define quality measures using the six dimensions proposed by the IOM

$$Value = \frac{Quality}{Cost}$$

Quality = Outcomes + Safety + Service

Service = Satisfaction + Access

Fig. 4. Value equation in health care.

in both ambulatory pediatrics and inpatient subspecialty settings. As future quality measures are developed, it may be prudent to involve families to provide a unique insight and enrich the scope of the measures.

Expanding Quality Measurement from a Systems Level to the Level of Individual Physicians

Most quality strategies focus on systems improvement. More recently, new policies being implemented by The Joint Commission require that quality be measured at the level of individual practitioners through such tools as the Ongoing Professional Practice Evaluation (OPPE) and Focused Professional Practice Evaluation (FPPE).[47] These policies will affect all physicians who have medical staff privileges in hospitals. The implementation of OPPE and FPPE, currently underway, provides an opportunity for physicians in leadership roles to ensure that this process is developed in a meaningful and effective manner.

The Unintended Legal Implications of the Quality Movement

The movement toward transparency of health care quality may have significant legal implications. No one yet fully knows how data easily gleaned from electronic health records, such provider performance and quality measures, will affect issues related to medical malpractice. The impact will likely vary among states because of differences in state laws.[48] However, quality and related outcomes information cannot be hidden. This is illustrated in the prominent case of Bristol Children's Hospital in the United Kingdom.[49] The class action litigation that emerged from the failure to share outcomes information regarding cardiac surgery has served as the catalyst for a significant movement toward transparency of cardiac outcomes in the United Kingdom. Furthermore, the case illustrates that outcomes information cannot and should not be hidden, and that transparency is the right policy to improve the care for children.

Availability of quality and outcomes information may even create a duty for physicians to include such information when obtaining informed consent. In the case of *Johnson v Kokemoor* decided by the Supreme Court of Wisconsin,[50] a surgeon was held liable for failure to obtain informed consent after neglecting to share with the patient available comparative outcomes information related to the surgical procedure. This highlights the importance of transparency and the potential legal liability that may be created by not sharing quality data with patients. There is a unique interaction between health care and law. It will be important to follow how the law evolves with the changing direction in health care quality, and also how the health care quality national agenda influences new laws.

Shared Savings Model

As quality improves, costs go down for patients, purchasers, and payers. How would providers fare in this new era of reduced health care expenditures? While P4P initiatives reward improvements in quality, current reimbursement systems do not necessarily reward behavior that reduces the cost of health care services. The shared savings model is a novel concept based on sharing the savings generated from efforts aimed at improving quality and reducing costs. Some places, such as California, are beginning to experiment with this approach. However, its application at a broad level will require major payment system reform to better align financial incentives.

SUMMARY

Our current mix of suboptimal quality, escalating costs, and eroding coverage reflects a health care system in chaos and underscores the urgent need for quality improvement efforts. Quality can be defined and encompasses the concept of operational quality, which is more than the traditional concept of clinical quality. Unsustainable increases in health care costs make it imperative that we understand the drivers of cost, including a significant component of waste. Quality and cost are linked, and it is important to include both in the equation to maximize the value obtained from health care expenditures.

The field of quality improvement, which continues to experience a paradigm shift, needs to be led and executed by physicians. Changing national drivers, including maintenance of certification requirements, P4P policies, and the transparency movement, will accelerate the adoption of quality improvement initiatives. Quality improvement and measurement is not perfect, and may have unintended consequences, including legal implications. However, embracing quality improvement and reducing health care costs is the right thing to do, so that we can make a real difference in our care of children.

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