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The Unintended Consequences of Quality Improvement

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Abstract

Purpose of Review—The focus on quality improvement has led to several types of initiatives in pediatric care; however, these programs may lead to potential unintended consequences.

Recent Findings—Unintended consequences of quality improvement programs that have been described are reviewed. Unintended effects on resource utilization include effects on costs, as well as the inability to apply programs across different populations and affect disparities in care. Unintended effects on provider behavior include measurement fixation behavior, as well as 'crowding out' behavior, in which gains in quality in one area may simply occur at the expense of quality of care in another area. Patient preferences may not always match specific quality improvement measures. Unintended effects for patients may include decreased patient satisfaction, trust or confidence in their provider.

Summary—Recognition and anticipation of the possible unintended consequences of guideline implementation is a critical step to harnessing all the benefits of quality improvement in practice.

Introduction

Over the last two decades, the focus on quality improvement movement has led to several types of initiatives in pediatric care: internal quality improvement programs; public reporting programs, in which comparative performance information is made publically available, such as the Leapfrog group initiative[1] and Medicare's Hospital Compare program in the US;[2] and "pay for performance" initiatives in which an external payor rewards providers for quality achievements,[3] such as the United Kingdom's pay for performance program, run by the National Health Service.[4] Quality improvement programs require defining and choosing a measure of quality, which can be a process measure such as vaccination rates in a population, or an outcome measure (e.g., mortality rates or rates of inpatient central line infections). Many of these programs have been successful in improving clinical practice and patient outcomes.[5]

However, with the positive effects of quality improvement programs, there may be unintended consequences that may result in increased health disparities, poor management

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or outcomes of other diseases not part of a specific quality improvement focus, or unnecessarily increased costs. This article reviews different unintended consequences that can occur in the different types of quality improvement programs. An understanding of these potential pitfalls can lead to more efficient and effective implementation of these programs for healthcare systems.

Types of unintended consequences

The basic premise behind quality improvement programs is that measuring performance and providing information about provider performance will change provider behavior either through individual behavior change or through system changes that facilitate individual behavior changes.[6] Unintended consequences may occur as a direct result of improved measure performance or as an indirect result of changes to provider or system changes. We have grouped the unintended consequences listed below according to direct and indirect effects on resource utilization, provider behaviors, and patients.

Unintended effects of changes in resource use

Increased costs—Several studies have documented decreased costs of care following the implementation of a clinical practice guideline for surgical or preventive procedures.[7-9] However, standardization of care through the use of clinical practice guidelines may lead to more predictable but not necessarily lower costs of care. For example, additional costs of guideline implementation may be due to increased use of medical resources such as medications or provider time, or due to the costs of training, coordination, and human resource and information management in a quality improvement program.[10] Performance measurement can be quite costly if it requires careful chart reviews; increased efficiency of measurement can be achieved with comprehensive electronic medical records and computerized physician order entry programs, which can also be quite costly to implement and maintain.[11-12] A cost-effectiveness analysis of the simulated implementation of six different clinical practice guidelines suggested that although guidelines can maximize cost-effectiveness for individual patients, this process does not always result in the maximization of cost-effectiveness from a societal perspective.[13]

Increased health disparities—Although quality improvement programs implemented at a population level are thought to be a method of decreasing disparities in care, improvements in care may exacerbate health care inequalities, rather than close such gaps.[14] If the benefits of a quality improvement program depend on individual patient response and access to care, those persons with access to greater resources, social networks or social capital may have greater access to the benefits of the program. Equal distribution of resources for quality improvement throughout the system may lead to unequal performance throughout the population, depending on individual patients' abilities to access care. Until the effects of a quality improvement program are distributed throughout the entire population, there may initially be increased disparities in health care. For example, Sequist and colleagues analyzed the effect of quality improvement efforts on changes in racial disparities in diabetes care within a multispecialty group practice. Although quality improvement improved some aspects of diabetes care, there were persistent disparities in the use of statins and in achievement of glycemic control.[15]

Additional resources may not be equally available throughout the system, leading to even greater disparities. In the inpatient setting, it has been shown that hospitals with limited resources for internal quality improvement initiatives perform differently than those with greater resources. A comparison of performance on quality measures in US hospitals with a high percentage of low socio-economic status patients to hospitals with a low percentage of these patients suggests that providers with greater resources to invest in quality

improvement were better able to improve their performance, thereby exacerbating health care disparities.[16]

Unintended effects on provider behavior

A potential effect of quality improvement programs on provider behavior occurs with the use of process measures in quality improvement programs (e.g., the percentage of asthma patients that received an asthma action plan) versus an associated outcome measure (e.g., improved patient understanding regarding their management). In this situation, it is possible that the measurement may be perceived by providers and defining what is "important."[17] As a result, the actions measured in a quality improvement program become more important than what they are supposed to represent. The lack of a valid measure can lead to "measurement fixation" when physicians may be unintentionally encouraged to improve the measure, as opposed to improving the intended goal of the measure.[18]

Another potential unintended consequence is the stifling of provider innovation.[19] The implementation of clinical practice guidelines should decrease inappropriate variation.[20] Practice variation, however, may have some utility. Medical practice is dynamic. As procedures or protocols are introduced, physicians try out new methods of care and new efficiencies or innovations may be discovered. As a result, quality improvement programs that measure processes of care rather than outcomes may inhibit process-level innovation.

In a system with a "fixed" amount of time and ability to accomplish tasks during the physician visit, gains in quality in one area may simply occur at the expense of quality of care in another area. Over the last several decades, the scope of services expected from primary care physicians is increasing,[21] while the amount of time for the typical office visit has not increased substantially.[22] As a result, the time and resources that are used to improve one aspect of practice performance take away time and resources that would have been allocated to guideline adherence in another area. For example, efforts to improve physician counseling regarding injury prevention may simply 'crowd out' time in the visit to address other counseling topics such as diet, nutrition, exercise or smoking cessation.

Lastly, there is evidence that pressures from quality improvement programs may lead to providers caring only for patient populations amenable to high performance on quality metrics. Implementation of a public reporting program for cardiac bypass graft surgery mortality rates in New York state led to decreased mortality rates in New York compared to other states during the same time period. However, it was found that New York state surgeons were operating on lower risk patients during that time period and referring higher risk patients at a higher rate to outside clinics.[23] In another example, McDonald and Roland described negative provider attitudes towards patients who may adversely affect their performance on 'pay for performance' measures.[24]

Unintended effects on patients

Individual patient preferences about clinical care may not directly match quality improvement performance measures. For example, a US Veteran's Administration hospital with low performance in colorectal cancer screening underwent a chart review to determine individual reasons for unscreened patients; 47% of cases were unscreened secondary to patient preference.[25] The pursuit of a performance measure that does not take into account patient preferences may lead to decreased patient satisfaction, as well as decreased provider satisfaction.

In addition, public reporting initiatives provide information to patients which may affect patient-provider relationships,[26-27] particularly in a situation in which a patient has limited ability to change providers due either to geographical or insurance constraints. There are

examples of positive outcomes if patients and providers collaborate to improve care;[28] however, there may be negative consequences for patients who lose trust in their hospitals or practitioners.

Lastly, quality information is not always completely accurate or reliable due to statistical uncertainty (e.g., if only small numbers of patients are available for measurement at a given institution) leading to a decreased ability to distinguish between providers delivering high quality versus low quality of care.[29-30] In addition, there are limitations due to data quality problems associated with administrative data, which is often used to determine performance rates.[31-33] If patients act on inaccurate or unreliable information, they may not optimize their health outcomes.

Monitoring and Preventing Unintended Consequences

Anticipating the unintended consequences in the planning stages of the quality improvement program planning and then monitoring for these consequences will help prevent poor patient outcomes. Using an asthma quality improvement example we illustrate potential unintended consequences (see Table 1 for summary).

Asthma is a common focus for pediatric quality of care; there is a high prevalence in the population, there is a good evidence base for preventive measures, and if well controlled, there is preventable morbidity. A commonly used performance measure is the percentage of patients with persistent asthma that are prescribed a daily controller medication.

Effects on resources

Increased prescription of daily controller medications can lead to increased costs of the medications, the cost of provider time to ensure that patients have adequate follow-up and refills, the costs for the treatment of patients who do not administer the medication correctly (no use of a spacer nor rinsing of their mouth after use) and develop oral thrush, and the cost of gathering and managing the data on measure performance. Anticipated decreased costs to the medical system include decreased emergency department (ED) visits and decreased hospital admissions. Improving rates of inhaled corticosteroid use is a cost effective method for improving pediatric asthma outcomes; however, given the relative infrequency of hospitalizations and ED visits, any cost savings may not be apparent or immediate.

Effects on provider behavior

Potential “crowding out” of counseling for other topics during the patient visit may occur. Such topics can include poison and injury prevention, diet and nutrition, or obesity prevention. Even if the intervention focuses on a specific topic for one disease (e.g., asthma), other asthma topics that are not the focus of the intervention may be neglected. To address this issue, a quality improvement intervention should be sensitive to other aspects of asthma care, as well as adherence to other guidelines, such as immunizations or use of asthma action plans.

The effect of “measure fixation,” in which the goal becomes improving rates on the measure rather than improving patient outcomes, may lead to aggressive prescription of daily-inhaled corticosteroids and an increased number of children with intermittent asthma that are prescribed such medicines unnecessarily. To address the issues of “measure fixation”, validation of process measures could also include assessment of outcomes such as daily patient asthma symptoms, emergency department visits and hospitalizations. Alternatively “whole system measures,” can be applied which are designed to assess how well the health care system is functioning as a whole to maximize patient outcomes.[34] This conceptual

approach avoids the problems of “measure fixation;” however, these measures remain to be validated as representative of whole health care system function.

Disparities could be exacerbated in asthma management either through individual providers’ turning away families who are less likely to be compliant, or through clinics serving a high proportion of patients with more social stressors and fewer resources. Comparison of inhaled corticosteroid prescription performance could be stratified by factors such as patient socio-economic status. To prevent a pay for performance program leading to increased gaps, higher rewards could be given that adjust for provider resource availability.

Effects on patients

Physician interactions with patients may be affected if physicians are aware they are being evaluated regarding the prescription of daily-inhaled corticosteroids. National asthma guidelines suggest the development of a partnership between the parent, child and physician. Patients perceived to be less likely to be compliant may be turned away from care or parents may feel more ‘pressured’ by physicians regarding the importance of daily-inhaled corticosteroids, which may lead to decreased trust and decreased satisfaction regarding the parent-physician visit. To address this issue, a quality improvement program could assess the effect on patient satisfaction, trust, and perceived completeness of the visit, or could allow physicians to exclude patients from the measured group, a process known as exception reporting. Exception criteria could include: patients in whom inhaled corticosteroids are contraindicated, patients who decline their use, or, in the case of influenza vaccinations for asthma patients, if a provider has made multiple attempts to bring the patient in for the vaccine. These criteria must be well defined using reliable data sources and be as objective as possible. Exception reporting has been used in the United Kingdom's pay for performance program and researchers found that most providers had a low rate of exception reporting (6% of patients excluded from measurement) with little variation between providers.[35]

Summary

In summary, unintended consequences of quality improvement programs can be categorized according to their effects on resource utilization, provider behavior changes, and direct patient effects. This framework provides a lens through which to consider potential unintended and negative consequences when considering implementation of a quality improvement initiative, and suggests methods of monitoring for each category: careful anticipation of changes in the flow of resources and cost-effectiveness analyses of the program at the outset and periodically; close management of provider attitudes and behavior, monitoring of other important health care interventions that are at risk of being “crowded out;” and careful choice of measures that have strong supporting evidence, and monitoring of important patient outcomes, including patient satisfaction, across all populations, stratified to assess for disparities in vulnerable populations. Recognition and anticipation of the possible unintended consequences of guideline implementation is a critical step to harnessing all the benefits of quality improvement in practice.

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Table 1

Potential Strategies to Anticipate and Address Different Types of Unintended Consequences

Type of Unintended Consequence		Example	Strategy
Resource Use	*General*	Increased costs to medical system due to direct patient care costs, or due to costs of data collection and information management	Anticipate and monitor potential increased costs of guideline implementation, assess cost effectiveness prior to implementation Consider subsidies to providers for electronic medical records which can facilitate data collection and management
	Asthma QI Example	Increased cost of collecting and reporting data on prescribing patterns and patient compliance	Balance increased cost and provider burden of data collection and information management against savings associated with fewer emergency room visits and hospitalizations. Consider pay for performance programs to provide resources to providers who will not benefit financially from savings seen by the decreased use of health system resources
Provider Behavior	*General*	Decreased attention to areas not subject to measurement due to guideline implementation The measurement indicator defines what is “important” and the actions that are “measurable” become more important that what they are supposed to represent	Monitor provider adherence to other guidelines that may be affected by increased attention towards quality measure performance Ensure that what is measurement indicator closely matches that outcome or action that is desired
	Asthma QI Example	Increased focus on prescribing asthma medications may lead to decreased attention to non-asthma issues or other asthma topics Aggressive prescription of daily-inhaled corticosteroids and an increased number of children with intermittent asthma that are prescribed such medicines unnecessarily	Monitoring provider ability to address other aspects of asthma care, as well as adherence to other guidelines Monitoring actual changes in patient symptoms, health care utilization
Patient Effects	*General*	Access to imperfect information, or information that is difficult for a lay person to use for decision-making Patient preferences may not directly match recommendations from a clinical practice guideline or quality improvement measure.	Ongoing validation of measures, and optimized accessibility to publicly reported information with adequate explanation as to methods used and how to interpret the information provided. Monitor patient satisfaction, trust, and perceived completeness of the visit. Consider ‘exception reporting’ when measuring provider performance.
	Asthma QI Example	Misinterpretation of performance measures for asthma care Decreased satisfaction with asthma care or overall care.	Monitor patient satisfaction, trust, and perceived completeness of asthma care or completeness of the visit.

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