Safe Practices for Better Health Care

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Abstract

Modern health care is highly complex, high risk, and error prone. Not surprisingly, health care errors and consequent adverse events are a leading cause of death and injury, even though well-documented methods to prevent the occurrence of many of these errors are available. The recent heightened attention that has been focused on medical errors has sparked interest in the use of health care practices that reduce the risk of harm resulting from the processes, systems, or environments of care, i.e., Safe Practices. At the request of—and with funding from—the Agency for Healthcare Research and Quality and the Centers for Medicare and Medicaid Services, the National Quality Forum (NQF) identified more than 220 candidate Safe Practices. Through its formal consensus development process, the NQF endorsed 30 evidence-based Safe Practices that should be universally employed in applicable clinical care settings to reduce the risk of errors and harm to patients. In addition, the NQF identified 27 promising practices that should be high priority for further research. This report identifies the 30 NQF-endorsed Safe Practices and describes some key aspects of the process used by the NQF in endorsing these first-ever national voluntary consensus standards for patient safety practices.

Introduction

Health care errors and consequent adverse events are a leading cause of death and injury in the United States,[1, 2] even though methods to prevent many of these errors exist. In January 2000, The Federal Government's Quality Interagency Coordination Task Force (QuIC) recommended that the National Quality Forum (NQF) "identify a set of patient safety measurements that should be a basic component of any medical errors reporting system" (and thereby standardize data collection and reporting by States) and "identify a set of patient safety practices critical to prevention of medical errors."[3] President Bill Clinton officially endorsed these and the QuIC's many other patient safety recommendations on February 22, 2000, and the NQF was formally requested to undertake these tasks on March 23, 2000. A contract to execute this work was finalized by the Federal Government in December 2000, and the NQF formally endorsed a set of 30 national Safe Practices in May 2003.[4]

This report identifies the 30 NQF-endorsed Safe Practices and 27 other practices that seem to have great potential for reducing adverse events and should have high priority for further research to establish their efficacy. It also describes some key aspects of the process used by the NQF in endorsing these first-ever national voluntary consensus standards for patient safety practices. These 30

NQF-endorsed Safe Practices provide a clear road map for improving patient safety.

Methods

About the NQF

Originally conceptualized by the President's Advisory Commission on Consumer Protection and Quality in the Health Care Industry,[5] the National Quality Forum was formally established as a public benefit corporation and a unique public-private collaborative venture in May 1999.[6, 7] It became fully operational in February 2000.

The NQF's mission is to improve American health care through the endorsement of consensus-based national standards for measurement and public reporting of health care performance data. The intent is to provide meaningful information about whether care is safe, timely, beneficial, patient-centered, equitable, and efficient. The NQF is a voluntary consensus standards-setting organization as defined by the National Technology Transfer and Advancement Act of 1995 (NTTAA)[8] and the revised Office of Management and Budget (OMB) Circular A-119.[9] The NQF has a formal process by which it achieves consensus and endorses standards.[10] This process meets the requirements of the NTTAA, and therefore NQF-endorsed consensus standards enjoy a consequent legal status. In particular, the NTTAA specifies that when a Federal Government agency establishes standards in an area, it is obligated to "use voluntary consensus standards in lieu of government unique standards except where inconsistent with law or otherwise impractical."[8]

In addition to endorsing voluntary consensus standards, the NQF also functions as an "honest broker" for health care quality improvement, convening health care's many stakeholders in an open and equitable manner to focus on specific quality-related issues. The NQF also engages in other activities aimed at promoting the use of standards, linking quality measurement to strategies for quality improvement, providing leadership, disseminating information, and exchanging knowledge and ideas. The NQF is the nexus where health care's many divergent stakeholders can come together to find a common approach to foster systemwide improvements in patient safety and quality.

In endorsing the Safe Practices, the NQF convened a broad-based steering committee to oversee the project, along with subordinate technical advisory panels, then proceeded as specified by the NQF's formal Consensus Development Process.[10]

One unusual aspect of this project was that some of the key foundational evidentiary work was performed independently by the University of California San Francisco-Stanford University Evidence-Based Practice Center (UCSF-Stanford EPC), which was commissioned by the Agency for Healthcare Research and Quality (AHRQ) to review the peer-reviewed medical literature for evidence-

based safe practices.[11] This literature review was conducted independently by the UCSF-Stanford EPC, and not under the direction of the project's steering committee, for reasons of contracting efficiency and the availability of funds. Once the UCSF-Stanford EPC completed its work, it was made available to the NQF Safe Practices Steering Committee, although by that time it was too late to influence how the review was completed or what was reviewed. This prolonged the project, as additional sources of information were reviewed that were not considered by the UCSF-Stanford EPC (see "Sources of candidate safe practices" below).

Purpose of the consensus set of Safe Practices

By achieving consensus on this set of evidence-based, high-priority Safe Practices by a diverse group of stakeholders, the NQF sought to promote greater awareness of practices known to improve patient safety, stimulate widespread implementation of the practices across the continuum of care, and, consequently, substantially improve patient safety. Further, it was felt that by having a formally endorsed set of clearly specified practices, it would be easier for health care providers to benchmark patient safety practices in their particular care settings.

Sources of candidate safe practices

The pool of candidate practices was derived from five sources: (1) the UCSF-Stanford EPC report commissioned by AHRQ;[11] (2) the three "safety leaps"[*] of the Leapfrog Group (a coalition of more than 150 public and private purchasers who collectively buy about $60 billion of health insurance annually); (3) the Safe Practices Project Steering Committee members, several of whom are patient safety content experts; (4) the NQF member organizations (about 180 organizations at the time); and (5) an open call for candidate practices to more than 100 medical specialty, nursing, pharmacy, and other health professional organizations.

Criteria for inclusion

To provide a pragmatic and structured method for consistently assessing candidate safe practices, all practices were evaluated based on five criteria: (1) specificity (the threshold criterion), (2) evidence of effectiveness, (3) likely benefit, (4) generalizability, and (5) readiness. These terms are defined below.

Specificity. The practice must be a clearly and precisely defined process or manner of providing a health care service. Pragmatically, the essential aspects of the practice must be clear enough that one can describe what needs to be done to someone with no knowledge of the practice and have a reasonable expectation that it will be successfully performed after being described. Conversely, what

[*] The Leapfrog Group took its name from their belief that through purchasing principles it could drive health plans and providers to take swift action to "leapfrog" over the prevailing state of poor quality. In this vein, a "safety leap" is the term used by the Leapfrog Group to signify a major improvement in safety, in contrast to incremental improvement.

must be done has to be clear enough that an auditor can review a practitioner's performance and reliably determine whether the practice is being implemented correctly. All candidate safe practices were screened according to this threshold criterion. Candidate safe practices that met the threshold criterion of specificity were then rated against the remaining four additional criteria relating to the likelihood of the practice improving patient safety.

Evidence of effectiveness. There must be clear evidence that the practice is effective in reducing the risk of harm resulting from the processes, systems, or environments of care. Such evidence may take various forms, including (1) research studies showing a direct connection between improved clinical outcomes (e.g., reduced mortality or morbidity) and the practice; (2) experiential data (including broad expert agreement, widespread opinion, or professional consensus) showing the practice is "obviously beneficial" or self-evident (i.e., the practice reduces reliance on memory, standardizes equipment or process steps, promotes teamwork or absolutely constrains a potential problem or forces an improvement to occur [e.g., removing vials of concentrated potassium chloride solution from general patient care areas so that they cannot be confused with similarly appearing vials of furosemide]), or (3) research findings or experiential data from nonhealth care industries that are substantially transferable to health care (e.g., repeat-back of verbal orders or standardizing abbreviations).

Benefit. Even if the practice has evidence of effectiveness, there also must be reason to expect that there would be a benefit if the practice were more widely used. That is, it would save lives that are endangered by health care delivery, reduce disability or other morbidity, or reduce the likelihood of a serious reportable event. An effective practice already in near-universal use would lead to little new benefit to patients by being designated a Safe Practice, so evidence-based safety practices already widely used were not considered for inclusion in the set.

Generalizability. The Safe Practice is usable in multiple clinical care settings (e.g., a variety of inpatient and/or outpatient settings) and/or for multiple types of patients.

Readiness. The necessary technology and appropriately skilled staff are available to most health care organizations.

Prioritizing the practices

By intent, the individual practices within the final set of NQF-endorsed Safe Practices were not prioritized or weighted, within or across categories, because all were viewed as important in improving patient safety and because no objective, evidence-based method of prioritizing the practices could be identified that would equitably apply across the heterogeneous universe of health care facilities that have to implement these practices. For any given health care provider, it is expected that the choice of practices that will have top priority will depend on the individual provider's circumstances, including which practices already have been

implemented, the availability of resources, environmental constraints, and other individual factors.

Results

Table 1 presents a description of and specifications for the 30 NQF-endorsed Safe Practices[4] and shows the applicable clinical care settings where the practices should be used. The practices are organized into five broad categories for improving patient safety: (1) creates a culture of safety, (2) matches health care needs with service-delivery capabilities, (3) facilitates information transfer and clear communication, (4) adopts safe practices in specific clinical settings or for specific processes of care, and (5) increases safe medication use. The majority of the Safe Practices have to do with improving the safety of medication use, although the four practices in the last category deal solely with medication preparation, labeling, packaging, storage, or handling.

Table 1. NQF-endorsed Safe Practices*

1.	Create a health care culture of safety.
2.	For designated high-risk, elective surgical procedures or other specified care, patients should be clearly informed of the likely reduced risk of an adverse outcome at treatment facilities that have demonstrated superior outcomes and should be referred to such facilities in accordance with the patient's stated preference.
3.	Specify an explicit protocol to be used to ensure an adequate level of nursing based on the institution's usual patient mix and the experience and training of its nursing staff.
4.	All patients in general intensive care units (both adult and pediatric) should be managed by physicians having specific training and certification in critical care medicine ("critical care certified").
5.	Pharmacists should actively participate in the medication-use process, including—at a minimum—being available for consultation with prescribers on medication ordering, interpretation and review of medication orders, preparation of medications, dispensing of medications, and administration and monitoring of medications.
6.	Verbal orders should be recorded whenever possible and immediately read back to the prescriber—i.e., a health care provider receiving a verbal order should read or repeat back the information that the prescriber conveys in order to verify the accuracy of what was heard.
7.	Use only standardized abbreviations and dose designations.
8.	Patient care summaries or other similar records should be prepared with all source documents immediately at hand (i.e., they should not be prepared from memory).
9.	Ensure that care information, especially changes in orders and new diagnostic information, is transmitted in a timely and clearly understandable form to all of the patient's current health care providers who need that information to provide care.
10.	Ask each patient or legal surrogate to recount what he or she has been told during the informed consent discussion.
11.	Ensure that written documentation of the patient's preference for life-sustaining treatment is prominently displayed in his or her chart.
12.	Implement a computerized physician order entry system.
13.	Implement a standardized protocol to prevent the mislabeling of radiographs.
14.	Implement standardized protocols to prevent the occurrence of wrong-site procedures or wrong-patient procedures.

Table 1. NQF-endorsed Safe Practices*, cont.

15. Evaluate each patient undergoing elective surgery for his or her risk of an acute ischemic cardiac event during surgery, and provide prophylactic treatment of high-risk patients with beta blockers.
16. Evaluate each patient upon admission, and regularly thereafter, for his or her risk of developing pressure ulcers. This evaluation should be repeated at regular intervals during care. Clinically appropriate preventive methods should be implemented consequent to the evaluation.
17. Evaluate each patient upon admission, and periodically thereafter, for the risk of developing deep vein thrombosis (DVT)/venous thromboembolism (VTE). Use clinically appropriate methods to prevent DVT/VTE.
18. Use dedicated antithrombotic (anticoagulation) services that facilitate coordinated care management.
19. Upon admission, and periodically thereafter, evaluate each patient for the risk of aspiration.
20. Adhere to effective methods of preventing central venous catheter-associated blood stream infections.
21. Evaluate each pre-operative patient in light of his or her planned surgical procedure for his or her risk of surgical site infection (SSI), and implement appropriate antibiotic prophylaxis and other preventive measures based on that evaluation.
22. Use validated protocols to evaluate patients who are at risk for contrast media-induced renal failure, and use a clinically appropriate method for reducing risk of renal injury based on the patient's kidney function evaluation.
23. Evaluate each patient upon admission, and periodically thereafter, for his or her risk of malnutrition. Employ clinically appropriate strategies to prevent malnutrition.
24. Whenever a pneumatic tourniquet is used, evaluate the patient for his or her risk of an ischemic and/or thrombotic complication, and use appropriate prophylactic measures.
25. Decontaminate hands with either a hygienic hand rub or by washing with a disinfectant soap prior to and after direct contact with the patient or objects immediately around the patient.
26. Vaccinate health care workers against influenza to protect both them and patients from influenza.
27. Keep workspaces where medications are prepared clean, orderly, well lit, and free of clutter, distraction, and noise.
28. Standardize the methods for labeling, packaging, and storing medications.
29. Identify all "high alert" drugs (e.g., intravenous adrenergic agonists and antagonists, chemotherapy agents, anticoagulants and antithrombotics, concentrated parenteral electrolytes, general anesthetics, neuromuscular blockers, insulin and oral hypoglycemics, narcotics and opiates).
30. Dispense medications in unit-dose or, when appropriate, unit-of-use form, whenever possible.

*For full report and detailed specifications, see *Safe Practices for Better Health Care: A Consensus Report,* Washington, DC: National Quality Forum; 2003.

The readiness criterion was especially controversial for routine use of critical care specialists or "intensivists" in intensive care units (ICUs) and implementation of computerized physician order entry (CPOE) because of the current limited number of intensivists who are available and the cost of implementing CPOE. In both cases, the evidence of effectiveness was felt to be so compelling that it overrode the concerns about readiness, and the practices were included in the final endorsed set.

Additional information about the relevant clinical problem, objective of the Safe Practice, exemplary approaches to implementation, references, and other topics are contained in the formal NQF project report.[4]

Table 2 describes 27 additional practices that could not be recommended for universal implementation at the time, but were believed to hold great promise for improving patient safety in the near term and thus should be given high priority for additional research or development of their specifications.

Table 2. Promising practices warranting high priority for research

	Research to demonstrate effectiveness
1.	Use of identification bracelets to alert providers of patients who are susceptible to falls.
2.	Use of specialized hospital flooring to reduce injury from patient falls.
3.	Use of machine-readable patient identification systems to replace conventional wristbands in order to reduce patient identification errors.
4.	Use of hand-held electronic prescribing devices to reduce medication errors.
5.	Application of strategies to inform patients of clinically significant abnormal or questionably abnormal test results.
6.	Use of computerized reminders to improve primary care provider compliance with patient notification of abnormal results.
7.	Use of CPOE compared to verbal orders to reduce transcription errors.
8.	Use of napping, strategic caffeine intake, and other coping strategies to mitigate the risk of harm associated with fatigue.
9.	Use of training programs to reduce fatigue-related preventable adverse events.
10.	Use of simulator-based training to reduce errors.
11.	Use of medical device alarms to prevent falls.
12.	Encouragement of each adult to designate a health care advocate who (1) knows the patient's medical history and treatment preferences; (2) can speak for the patient when he or she is not able to speak for him- or herself; and (3) can otherwise help ensure that the patient understands his or her treatment and thus receives appropriate treatment.
	Research to demonstrate the likely benefit of implementing the safe practice (i.e., how much the practice would reduce morbidity and mortality if universally implemented)
13.	Use of antibiotic impregnated catheters (e.g., coated with minocycline and rifampin) instead of standard, noncoated catheters.
14.	Use of multidisciplinary teams (i.e., a geriatrician, clinical nurse specialist, social worker, and specialists from such fields as occupational and physical therapy, nutrition, pharmacy, audiology, and psychology) in a dedicated geriatric unit.
15.	Use of selective digestive tract decontamination (i.e., the use of nonabsorbable antibiotics topically applied to the gastrointestinal tract in an effort to sterilize the oropharynx and stomach) to decrease the pathogenicity of aspirated secretions and reduce the incidence of ventilator-associated pneumonia.
16.	Use of specially designed endotracheal tubes for the continuous aspiration of subglottic secretions.
17.	Use of external plastic pad or shield hip protectors padded or constructed with foam-type materials to prevent harm from patient falls.
18.	Use of patient self-monitoring home finger-stick devices and nomogram to self-adjust warfarin dosages.
19.	Use of perioperative oxygen supplementation to reduce infection rates.
	Research to improve existing safe practices
20.	The application of CPOE in rural settings and small community hospitals.
21.	Use of high-volume referrals in rural settings for patients scheduled for high-risk, elective procedures or treatments.

Table 2. Promising practices warranting high priority for research, cont.

22. The readiness of using intensivists (who have specific training caring for the critically ill and are board certified in critical care medicine) in rural settings to manage all patients in adult general medical and surgical intensive care units.
23. The identification and application of practices to improve patient safety for vulnerable populations.
Research to develop and assess implementation
24. The development of institutional incentives to implement the safe practices.
25. The development of strategies to involve consumers in the implementation of safe practices.
26. The development of tools to determine which implementation strategy is most effective in achieving universal implementation of a practice.
27. The development of tools to evaluate the success (i.e., degree of use) of implementation.

Discussion

The 30 NQF-endorsed Safe Practices identified should be implemented in applicable clinical care settings to reduce the risk of harm to patients. They have been culled from a pool of more than 220 candidate practices, based on each practice's specificity, effectiveness, likely benefit, generalizability, and readiness for implementation. The practices have been carefully reviewed by a diverse group of health care stakeholders pursuant to the NQF's formal Consensus Development Process and have the special status of "voluntary consensus standards." In brief, this set of Safe Practices provides a clear road map for how to improve patient safety.

If fully implemented, the Safe Practices identified here should go a long way toward improving the safety of health care. It is important to note, however, that this project did not identify performance measures that could be used to evaluate the degree of implementation of a practice. There is an urgent need to identify performance measures that can be used to reliably assess, quantify, and report the degree of utilization or implementation of each the Safe Practices; such information is important to assist providers with internal quality improvement and to facilitate consumer and purchaser choice.

In addition to the 30 Safe Practices, 27 practices were identified because of their potential promise to improve patient safety. If further investigation affirms their efficacy, it is anticipated that they will be endorsed by the NQF as Safe Practices in the next few years.

Research also should be undertaken to investigate methods to ascertain the success and impact of the Safe Practices and to determine whether use of these practices causes new concerns. Given the complexity of health care, it is not possible to predict with certainty the full effect of any change introduced into the care delivery process. Even well-intended, well-researched changes may have unintended, untoward effects.

NQF supports widespread dissemination of information about these practices and that they be widely implemented as quickly as possible. In this regard, it is encouraging that in April 2004, the Leapfrog Group adopted a market basket approach to the Safe Practices as their fourth safety "leap." (Three of the Safe Practices were based on the original three Leapfrog practices that constituted its first three safety leaps; the remaining 27 Safe Practices are the subject of the fourth leap.) This, and endorsement by other purchaser coalitions (e.g., Pacific Business Group on Health, The Employer Alliance Health Care Cooperative, Midwest Business Group on Health, among others) seems to have substantially increased interest in the Safe Practices in 2004.

Finally, given the rapidity with which biomedical knowledge, diagnostic and treatment technology, and health care practice change, patient safety concerns are continually changing. New innovations to reduce morbidity or mortality from adverse health care events should be widely disseminated and implemented as soon as possible, and the Safe Practices must be updated to stay current with practice. Nonetheless, for purposes of stability and consistency of program implementation, the set of Safe Practices should be implemented for a period without introducing new definitions, criteria, or practices. It is recommended that the Safe Practices be reviewed in 2005 or 2006 for their currency and to assess areas previously listed as high priorities for research to see if additional practices should be endorsed as Safe Practices.

Conclusion

In an effort to increase patient safety and reduce health care errors, the NQF has identified a core set of Safe Practices that would substantially reduce the morbidity and mortality caused by health care errors if these practices were universally implemented in applicable clinical care settings. The availability of this compendium of Safe Practices should help hospitals and other health care providers implement quality improvements that reduce health care errors, and provide information that can be used by consumers and purchasers of health care to obtain services from the safest possible setting. In the most basic sense, this set of Safe Practices provides a roadmap that can be used to navigate health care's complicated highway in a manner that optimizes the likelihood of a safe outcome.

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