Implementing Patient Safety Interventions in Your Hospital: What to Try and What to Avoid

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In the response to the Institute of Medicine report, To Err is Human [1], and the widespread interest in patient safety that it generated, the US Agency for Healthcare Research and Quality (AHRQ) was asked to study and improve the safety of the health care system. One of the initial projects funded by the AHRQ under this initiative was a comprehensive review of the literature that summarized the evidence supporting more than 75 specific patient care interventions [2,3]. Interventions that received the highest ratings for strength of evidence and potential impact tended to be clinical (eg, venous thromboembolism prophylaxis, perioperative beta-blockers, and measures to reduce nosocomial infections). Some leaders in the patient safety field criticized the emphasis on such clinical interventions over more explicitly safety-oriented interventions such as computerized provider order entry (CPOE) [4]. However, the advantages of this more evidence-oriented approach to improving patient safety, focusing on specific interventions that reduce complications of care, has gained greater acceptance [5]. In fact, the Institute for Healthcare Improvement’s well-publicized “100,000 Lives” campaign [6] was based on the principle of leveraging widespread implementation of evidence-based interventions, rather than more general approaches to improving patient safety.

Despite the growing acceptance of using evidence to inform decisions about what to implement, the evidence base in patient safety remains young and has not yet stabilized. Increased publication of patient safety research in
recent years [7] has resulted in serious questions about several interventions that had high ratings in the 2001 AHRQ report. For instance, perioperative beta-blockers received the second-highest rating in the AHRQ report on the basis of five randomized trials that, although relatively small, all demonstrated consistent and substantial benefits [8,9]. However, 5 years later, more than 20 randomized controlled trials had been published, and meta-analysis of their results revealed questionable benefit and definite harm [10]. Similarly, N-acetylcysteine had shown a dramatic 90% reduction in contrast nephropathy in a single randomized controlled trial [11] and received a fairly high evidence rating [3]. However, numerous subsequent studies have shown inconsistent results [12,13]. In addition to contradictory evidence about benefit, new studies can reveal potentially unrecognized problems (analogous to side effects of clinical therapies), such as new opportunities for error from complex interventions such as CPOE and bar coding [14,15].

Evidence may change, but the need to respond to patient safety problems nonetheless remains. In this article, the authors outline a framework for choosing candidate patient safety interventions and discuss specific patient safety practices hospitalists should consider implementing at their hospitals.

Definitions and target audience

The authors define a patient safety intervention as any practice that reduces the probability of adverse events resulting from exposure to the health care system [3,16]. The use of the phrase “exposure to the health care system” makes it clear that adverse events can result not just from active treatments and procedures but also from simply being hospitalized, as with nosocomial infections. Although this definition makes no reference to the concept of “error,” errors clearly play a causal role in the development of many adverse events. In this broader view of patient safety, errors take on the role of an intermediate clinical outcome. Just as we target blood pressure control to reduce myocardial infarction and stroke, targeting errors plays a role in preventing many adverse events.

Hospitalists have a natural role to play in improving patient safety, given their broad clinical expertise and frequent leadership roles in hospital quality improvement activities [16,17]. Hospitalists may work with administration to spearhead organizational change; however, in this article, the authors focus on interventions that hospitalists could decide to implement without the need for major institutional investment.

Choosing patient safety interventions to implement

Quality improvement efforts often focus on disseminating firmly established processes of care (eg, aspirin and beta-blockers for patients who have acute myocardial infarction). However, patient safety has yet to find its “aspirin and beta-blocker” because few, if any, interventions have such robust
supporting evidence. Thus, considerations other than just evidence must play a role in the decision to implement specific patient safety interventions. These factors include the prevalence and severity of the safety problem targeted by the intervention, the strength of the evidence supporting the intervention, the potential for undesirable side effects of the intervention, the costs and complexity of efforts to implement the intervention, and the potential of the intervention to generate momentum for further safety initiatives (Box 1).

**Box 1. Framework for selecting candidate safety interventions to implement**

**Scope of the problem**
The scope combines the prevalence and severity of the safety problem; common problems with modest impact would score highly, as might less common but serious problems (eg, incorrect patient wrist bands).

**Effectiveness**
The effectiveness is the strength of evidence in support (eg, their validity) combined with the magnitude of effect (how well the intervention seems to work).

**Need for vigilance**
Does implementation of the practice require monitoring for unintended consequences (eg, problems due to increased handoffs after reducing work hours or new errors created by a CPOE system)?

**Implementation issues**
Cost and complexity should be considered; some interventions are costly but not complex (eg, hiring more nurses or pharmacists), whereas others are both, and thus at high risk for implementation failure (eg, any major change in how care is organized across disciplines, or implementation of a bar-coding system).

**Momentum or synergy with other interventions**
Of the various interventions one could implement at a given institution, some will have the potential to create momentum for additional initiatives or will relate to existing interests of clinical, administrative, or research leaders in the institution.

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The existing literature often provides data on the first two factors (the scope of the problem and the effectiveness of a candidate solution), but less often on implementation issues and unintended consequences. However, the literature in this arena is growing. Examples involving unintended consequences from CPOE and bar coding have already been mentioned [14,15]. Examples also exist for less technical interventions. For instance, although patient isolation for infection control may help reduce transmission of nosocomial infections, it also increases the risk of adverse events, perhaps because isolated patients receive less careful attention from physicians and nurses [18]. Even apparently simple interventions, such as elevating the head of the bed to prevent ventilator-associated pneumonia, can prove surprisingly difficult to implement [19].

When data on implementation issues are not available, hospitalists should consider the following factors: the need for involving personnel from different disciplines, new education and training, impacts on workflow, and changes in organizational culture. Interventions requiring fundamental changes in any of these areas are less likely to succeed [20,21]. The easiest interventions to implement are those that fit well with what clinicians already do (ie, prescribing drugs [eg, to prevent venous thromboembolism] and using medical devices [eg, ultrasound guidance for central line insertion]). More substantive changes are easier to accomplish if they involve only one group of providers (eg, a new patient sign-out system for physicians), or involve adding more staff to perform ongoing activities (eg, hiring more nurses or pharmacists). That said, sometimes more complex interventions can lead to far greater rewards. The suggested framework (see Box 1) will help physicians evaluate this tradeoff between the resources required to implement a given patient safety intervention and the magnitude of the expected benefits. The authors recommend a “balanced diet” of patient safety interventions that hospitalists should consider implementing, consisting of some “low-hanging fruit” (practices that are easy to implement and supported by a strong evidence base), some momentum-generating projects (practices with a smaller evidence base, but that are likely to positively affect the institution’s culture of safety), and some system-wide interventions where hospitalist involvement will be beneficial.

**Important patient safety practices for hospitalists: “low-hanging fruit”**

The following practices should be considered for implementation by all hospitalists, because they address common patient safety problems, are supported by strong evidence, are relatively easy to implement, and have low potential for harm (Box 2). In general, the authors considered practices to have a strong evidence base if a systematic review reported clear benefit, or the only randomized trials to have evaluated the intervention demonstrated effectiveness.
Ultrasound-guided central venous catheter insertion

More than 5 million patients in the United States receive central venous catheters every year, and in some series, up to 19% of these patients experience a mechanical complication (ie, arterial puncture, hematoma, or pneumothorax) [22,23]. A 2005 meta-analysis of seven studies comparing ultrasound guidance to the standard landmark method showed a significantly reduced overall failure rate of central venous catheter insertion attempts [24], particularly for internal jugular venous catheterization, and a reduction in mechanical complications. Ultrasound equipment and training of operators costs $10,000 to $15,000, although one analysis suggested this expense would be offset by complications averted [3]. Use of ultrasound guidance has not been associated with harm, although the concern exists that operators trained only in catheter placement using ultrasound guidance may be unable to use the traditional landmark method when ultrasound equipment is unavailable. This concern can be addressed by periodically permitting clinicians to perform catheterization without the use of ultrasound guidance to maintain skills with the landmark method.

Prevention of central venous catheter–related bloodstream infection

Approximately 80,000 patients in the United States experience catheter-related bloodstream infections (CRBSI) yearly, most of which occur in ICU patients [25–27]. The Centers for Disease Control and Prevention recommends several proven strategies to prevent CRBSI [25], which center around improving sterility at the catheter insertion site:

- Appropriate hand hygiene before insertion and during catheter maintenance

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**Box 2. “Low-hanging fruit”**

*Practices with a relatively strong evidence base (or strong face validity) that target broad problems, are easy to implement, and have low potential for harm*

- Ultrasound-guided central venous catheter insertion
- Prevention of catheter-related bloodstream infection
- Automatic stop orders to reduce urinary catheterization
- “Read-backs” for critical communications

*Interventions targeting patient safety at the time of hospital discharge (lower-quality supporting evidence, but high impact)*

- Postdischarge telephone calls to patients
- Structured discharge summaries
- Structured handoff communications
• Maximal sterile barrier precautions (use of a mask, cap, sterile gown, and gloves when inserting a catheter)
• Use of chlorhexidine (instead of povidone-iodine) for skin antisepsis
• Avoidance of femoral vein catheterization, except in emergencies
• Prompt removal of unnecessary catheters

The effectiveness of these simple, easy-to-implement strategies was demonstrated in the Keystone ICU project [28], in which 103 ICUs demonstrated significant reductions in CRBSI incidence over an 18-month follow-up period. The Institute for Healthcare Improvement also included prevention of CRBSI in its “100,000 Lives” campaign [6] through its central line “bundle,” which includes the above interventions. Implementation of strategies to reduce CRBSI will go toward satisfying the Joint Commission for Accreditation of Healthcare Organizations’ (JCAHO)’s National Patient Safety Goal 7 (“Reduce the risk of healthcare-associated infections”) [29].

Prevention of catheter-associated urinary tract infections

Nearly all hospital-acquired urinary tract infections (UTIs) are associated with indwelling urinary catheter use [30–32]. Although urinary catheters are usually inserted for appropriate reasons, they often remain in place without clear indications for continued use, perhaps because physicians frequently overlook their presence. Unnecessary catheter use predisposes to bacterial colonization and eventual symptomatic UTI [33]; thus, effective catheter-associated UTI prevention strategies target duration of catheterization. A systematic review [34] found that automatic stop orders, in which urinary catheters were removed after 48 to 72 hours, unless a physician specifically countermanded the order, were effective at reducing duration of catheterization and asymptomatic bacteriuria, although the effect on symptomatic UTI rates was less clear. This intervention resulted in minimal harm to patients (a low rate of catheter reinsertion) and was easy to implement. Moreover, physicians also tend to overlook the extent to which urinary catheters bother patients [30]. Even if the magnitude of the impact on clinical UTI rates remains unclear, the impact on patient satisfaction is probably substantial.

“Read-backs” for laboratory results and other high-priority communications

The Joint Commission’s 2007 National Patient Safety Goal 2 requires hospitals to “improve the effectiveness of communication among caregivers” [29], and specifically includes communication of critical laboratory test results as part of this goal. Similarly, failure to accurately identify patients being called for procedures or to confirm verbal orders correctly has resulted in several high-profile errors [35]. “Read-back” protocols (asking the recipient to repeat the information just communicated) are an easy-to-implement intervention that has the potential to prevent such
communication errors [36,37]. Although fewer studies address this issue than the other “low-hanging fruit,” the strategy should have minimal cost and low potential for harm, and thus is appropriate for widespread implementation. One proof of concept study [36] showed that, among 822 outgoing calls from clinical laboratories for the purpose of communicating critical laboratory results, the process of “read back” revealed errors in 3.5% of cases.

**Interventions highly relevant to hospitalist practice: improving safety around transitions in care**

The period immediately following hospital discharge may be dangerous for patients. Two studies contacted patients within 3 weeks of their discharge from the medical service at academic teaching hospitals and found that approximately 20% experienced adverse events (defined as new symptoms, unanticipated visits to a health care provider, or death) [38,39], most commonly adverse drug events or health care–associated infections. In 3% to 6% of cases, serious injury or death was attributable to a preventable adverse event. Overall, one half of the adverse events could have been prevented (or at least ameliorated) by the inpatient physicians. Patient harm may also result from failure to follow up appropriately on tests performed during hospitalization. In one study, 41% of patients discharged from the medical service at an academic medical center had test results pending at the time of discharge, but the patient’s outpatient physician was unaware of the pending results 60% of the time [40]. Hospitalists are well positioned to address these problems at the inpatient–outpatient interface, and interventions to improve patient follow-up and communication between clinicians (especially inpatient and outpatient physicians) could significantly improve patient safety [41]. Practices in this group generally have lower-quality supporting evidence than the “low-hanging fruit” and may require more resources to implement, but are relevant to virtually all patients cared for by hospitalists and have little or no potential for harm.

**Postdischarge follow-up phone calls**

Given the prevalence of complications soon after discharge, early telephone contact with recently discharged patients could identify at-risk patients in need of immediate assistance or close follow-up. Although a recent Cochrane Collaboration systematic review did not find that such interventions were effective overall [42], most studies included in the review did not evaluate patients discharged from general medical wards and contacted patients up to several weeks after discharge, which may have led to the null result. Two studies more relevant to hospitalists [43,44] used nonphysician providers (pharmacists in one study and nurses in the other) to contact patients within 1 week of discharge. As in other studies, a considerable proportion of patients had developed new symptoms or concerns requiring
contacting the inpatient physicians or other assistance (15% and 44% in the two studies); patient satisfaction was improved in both studies, and telephone follow-up by pharmacists resulted in a significantly reduced risk of emergency department visits after discharge [43]. Although follow-up phone calls should benefit patients, additional costs will be incurred, and dedicated resources will be required for adequate implementation. If resources are limited, physicians may consider targeting high-risk patients (eg, elderly patients, patients prescribed multiple new medications, or patients who have pending test results).

Structured discharge summaries

Similarly, structured communication between inpatient and outpatient physicians can help avert adverse outcomes due to postdischarge adverse events. The traditional dictated discharge summary is of limited value for patient safety purposes because it generally does not reach the outpatient physician before the patient follows up, and does not necessarily contain the information outpatient physicians need to ensure continuity of care [41,45]. A structured discharge summary should contain a complete medication list and information on new diagnoses, changes in medications since admission, pending investigations, and recommended investigations for nonacute problems identified during hospitalization. Ideally, this basic information should be transmitted directly to the outpatient physician at the time of discharge. Less important elements of the discharge summary, as identified in a survey of outpatient physicians [46], include inpatient laboratory data and radiology reports.

Structured sign-out systems

Discontinuity among providers has become an inevitable reality of medical practice [47], and managing this discontinuity is particularly relevant for hospitalists in both academic and community settings. Prior research has demonstrated that patients are at an increased risk of preventable adverse events while they are cared for by a covering physician [48]. Structured sign-outs should include accurate administrative information, specific tasks, and contingency planning. “Closing the loop” by accurately relaying events that occurred during cross coverage is equally important [49]. Trials of standardized sign-out systems, largely performed in residency programs [50,51], have successfully reduced the incidence of adverse events and have also improved physician efficiency and perception of continuity of care.

Implementing mechanisms for targeting patient safety during care transitions addresses three of the JCAHO National Patient Safety Goals: “Improve the effectiveness of communication among caregivers” (goal 2), “Improve the safety of using medications” (goal 3), and “Accurately and completely reconcile medications across the continuum of care” (goal 8).
Medication reconciliation

To comply with goal 8 (and the “100,000 Lives” campaign), many hospitals are investing resources in ensuring patients’ medications are not stopped or changed inappropriately. This process of “medication reconciliation” [52] is undoubtedly important because, as multiple studies demonstrate, medications are changed without a clear indication at admission [53], at transitions during hospitalization (ie, when a patient is discharged from the ICU [54,55]), and at discharge [56]. However, many caveats remain regarding medication reconciliation. No study has yet documented an improvement in patient outcomes through reconciling medications, and the best method of accomplishing reconciliation remains unclear. Basic questions, such as when reconciling medications is most important (at admission, during in-hospital transitions, or at discharge), which patients will benefit the most (all patients versus patients who have complex medication regimens), and who should carry out the process (nurses, pharmacists, or physicians), remain unanswered. Given the complexities of hospital workflow, the answers will likely vary from hospital to hospital. Medication reconciliation will likely benefit some patients (eg, patients on many medications or on high-risk medications), but, as with many problems in the new field of patient safety, more data are needed on the scope of the problem and the types of patients most likely to be affected. Although many hospitalists likely will be involved in medication reconciliation activities, the authors believe that postdischarge follow-up calls, structured discharge summaries, and structured sign-out systems will provide more immediate benefits to patients, with fewer implementation difficulties.

Momentum-generating projects

Some practices have weak evidence, but substantial face validity and a low risk of harm, and offer the potential to establish collaborative relationships across disciplines that may generate momentum for future patient safety projects. These include

- Rapid response teams
- Executive walk rounds
- Teamwork training

Hospitalists might consider implementing some of these momentum-generating interventions to establish patient safety as a priority at their institution, improve morale among frontline providers, and generate support from senior administrators for future activities.

Rapid response teams

Because of their inclusion in the Institute for Healthcare Improvement’s “100,000 Lives” campaign, rapid response teams (RRTs) have
become one of the most widely implemented patient safety interventions in American hospitals, with nearly 3,000 hospitals committing to the implementation of an RRT. The concept behind RRTs is intuitively appealing: at the first sign of clinical deterioration, a team of providers is immediately summoned to the bedside to initiate treatment, ideally preventing further deterioration and adverse clinical outcomes such as ICU transfer or cardiac arrest. Although many uncontrolled studies claim great improvement in patient outcomes [57–61], careful analysis of these studies demonstrates serious problems in outcome measurement and reporting of co-interventions, calling their results into question [62–64]. The only controlled trial of RRTs (the cluster-randomized MERIT trial performed in Australia [65]) failed to show any benefit of the RRT on any clinical outcome. In fact, the control group hospitals (which received an educational intervention on caring for critically ill patients) experienced the same reduction in inpatient mortality and cardiac arrest rates as the intervention group hospitals (which received the educational intervention and started an RRT) [62]. The lack of benefit seen in this well-designed trial has been attributed by some to inadequate implementation in the intervention arm [66], but, in fact, implementation (as measured by calls per 100 patients) was greater than reported in all but one previous trial [62].

Given the plausibility of the idea underlying RRTs, some form of the intervention probably does improve patient outcomes, further highlighting the importance of the specifics of implementation. Although the optimal format for implementing RRTs remains unclear, compelling reasons nonetheless exist for hospitalists to proceed with this intervention (or maintain an RRT that has already been implemented). Anecdotal and some empiric evidence [67,68] indicates that they are extremely popular among nursing staff. Moreover, those staffing RRTs are well positioned to notice recurring problems that jeopardize patient safety [69]. A 2005 survey showed that one third of hospitalists have the primary responsibility for the RRT [70]. Hospitalists may consequently find that RRTs reveal important safety problems to target, and that the enthusiasm they generate among nurses and other staff provides the organizational support required to solve these problems.

Thus, although hospitalists should not consider establishing an RRT a top priority, RRT implementation may be used as a vehicle to promote interprofessional collaboration, identify patient safety issues that are important to bedside providers, and lay the foundation for future projects. Major barriers to implementing an RRT are the need for dedicated time and resources, the extensive implementation process needed to introduce this new system of care and ensure appropriate usage, and the need to monitor patient outcomes carefully to document RRT effectiveness. Unfortunately, despite the widespread implementation of RRTs, few reports are available to guide hospitalists in these matters [69].
Executive walk rounds

In addition to addressing specific patient safety issues, hospitalists should strive to create a “culture of safety” [37,71,72] at their hospitals. Key elements of safety culture include establishing a blame-free environment, creating an environment conducive to collaboration across disciplines and hierarchies, and committing leadership and resources to patient safety initiatives. Executive walk rounds, in which senior hospital leadership conduct informal visits to different areas of the hospital along with physicians and nurse leaders, have been associated with significant improvements in perceptions of the culture of safety [73,74]. For executive walk rounds to be successful, leaders should encourage nonjudgmental discussion of factors that led to adverse events or near misses, and should provide concrete and timely follow-up when issues are raised. In surveys, hospital executives frequently identify low physician participation as a barrier to inpatient quality improvement activities [75]. Hospitalists are uniquely positioned not only to lead quality improvement and patient safety projects but to liaise with senior management to identify and address safety concerns.

Teamwork training

Crew resource management (CRM), a concept initially studied in aviation, encompasses various training strategies designed to promote teamwork among groups of providers by teaching communication skills, de-emphasizing hierarchies, and promoting collaborative approaches to solutions. Medical applications of CRM have been conducted in the operating room and emergency department [76–78], with some success at improving participants’ attitudes and behaviors. However, the bulk of the evidence (including a recent cluster-randomized trial of CRM conducted in obstetrics and gynecology units [79]) has not demonstrated improvement in patient outcomes [78]. Formal CRM training has not yet been evaluated in medicine or pediatrics units, but may have a role in resuscitation and ICU care, responsibilities that fall to many hospitalists. Given the positive effects on teamwork attitudes and behaviors, CRM potentially can be an important component of improving the safety culture. Hospitalists should thus consider participating in CRM activities to generate momentum for widespread patient safety activities, with the caveat that CRM’s effect on patient outcomes remains unknown.

Interventions that are commonly used but lack demonstrated benefits

All hospitals are required to maintain an incident reporting system so that frontline providers may report patient safety and quality problems in an anonymous fashion. Although these systems are ubiquitous, thus far they have not proved useful in addressing specific patient safety issues [80]. Given the voluntary nature of incident reporting systems, the data
gathered from them are subject to reporting bias [81] and do not represent a comprehensive picture of patient safety within an institution. Furthermore, reports often reach management too late to address a specific incident, causing providers to lose faith in the system and fail to file reports. Physicians, in particular, rarely file incident reports [82], in part because of a widespread perception that issues are not addressed. Thus, the authors do not believe that hospitalists should focus on incident reporting as a priority tool to improve patient safety.

One major goal of incident reporting systems is to identify serious adverse events that should be investigated further. Root cause analysis (RCA) is a widely recommended tool for investigating such incidents [83]. An RCA is performed retrospectively, by forming a multidisciplinary team to investigate possible contributing factors to an adverse event in each of several predefined causal categories (e.g., personnel, training, equipment, and scheduling). The goal of an RCA is to identify latent errors (errors caused by system flaws) in addition to active errors (errors at the point of human interface with the system).

The Joint Commission mandates performance of an RCA when so-called “sentinel events” occur, but their value as a routine tool is limited. One of the authors (KGS) has had the chance to participate in a number of RCAs (or observe their results) at institutions that had investigated incidents that typically involved numerous errors [35] and substantial harm (including death) to patients [84–86]. Instead of identifying systematic problems and developing appropriate solutions, many institutions focused on only the most superficial of contributing causes and instituted changes that were unlikely to reduce the likelihood of subsequent events similar to the index cases. In hindsight, this experience should not have come as a surprise. System problems contributing to errors include issues such as staffing ratios and work schedules better designed to meet resource constraints than targets for safe operation; poor communication within and across disciplines; inadequate or poorly designed information technology support; and fragmentation of care, to name just a few. Identifying such problems is easy but solving them is difficult.

RCAs can have an effect on improving safety through identifying active errors and simply raising awareness of both latent and active errors. Because hospitalists will likely be asked to participate in RCAs, they should be aware that in most cases, the RCA itself is only the diagnostic arm of addressing a safety problem. The therapeutic arm often will require intensive, concerted efforts by multiple personnel from across various departments and disciplines within an institution. Such efforts should be made when warranted, but simply performing a series of RCAs has the potential to lead to frustration if problems are identified but not addressed. Perhaps after succeeding with a few “low-hanging fruit” and one of the above momentum-generating projects, a hospital might be in a position to tackle successfully some of the system problems that come to light in a well-conducted RCA.
System-level interventions benefiting from hospitalist involvement

Recommended interventions to improve safety include the clinical interventions discussed above and interventions that promise to fundamentally alter day-to-day practice for hospitalists. Chief among those are

Computerized physician order entry (CPOE)
Electronic medical records (EMR)

The authors strongly recommend that hospitalists become involved in the implementation of such systems, rather than view themselves as mere end users, to ensure optimal implementation and integration into provider work flow.

Computerized provider order entry

CPOE has been widely recommended as a means of reducing medication errors, yet in practice, few institutions have successfully implemented CPOE and achieved the touted benefits [87]. CPOE systems are difficult to implement because careful attention must be paid to integrating CPOE into clinician workflow; conflict between the system designers and physicians was in part responsible for one high-profile implementation failure [88]. In another case, CPOE implementation may have contributed to increased mortality in pediatric ICU patients [89]. This increase was attributed to failure to integrate CPOE properly into provider workflow, taking clinicians away from the bedside and resulting in an inability to obtain medications when urgently needed. Implementation issues and cost likely explain the slow uptake of CPOE systems in American hospitals [90–92].

Nevertheless, although CPOE implementation is time consuming, it can be performed well; when the same CPOE system associated with increased mortality was subsequently implemented in another pediatric ICU, careful attention to implementation factors (in consultation with the institution that originally implemented the system) resulted in no adverse consequences for patients [93]. CPOE provides many opportunities to improve safety; institutions with longstanding CPOE systems have seen reductions in medication errors [87]. Moreover, CPOE can be used as a tool to promote adherence to recommended care and provide decision support for physicians [94]. Because increased computerization in the hospital environment is inevitable, hospitalists will be well served to play an active role in CPOE implementation at their institution. Lack of physician input has been consistently identified as a factor in failed CPOE implementation [91,92], but by involving themselves early in the process, hospitalists can help customize CPOE systems to maximize their usefulness while minimizing interference with workflow.

Electronic medical records

Similarly, although many American hospitals already have an EMR, full implementation has still not been achieved [95] and many hospitals are
substantially updating existing systems. EMRs can improve a provider’s efficiency [96] but, as with CPOE, poorly designed systems can interfere with provider workflow. Unintended consequences of EMR systems, such as the perpetuation of incorrect information by cutting and pasting [97,98], have also been documented. Hospitalists are particularly reliant on EMRs to obtain and transmit clinical information at the time of care transitions; thus, when the opportunity to help implement an EMR system presents itself, hospitalists should avail themselves of the opportunity. Hospitalists will also be well positioned to monitor for potential adverse consequences of CPOE and EMR, and early collaboration with the system developers will help address these problems if they arise.

Summary

The “balanced diet”

When considering a patient safety project, hospitalists should think about not only the scope of the problem and projected effectiveness of the intervention but also the ease of implementing the intervention, its cost, and its potential for harm. Based on these factors, the authors have reviewed several candidate patient safety practices that hospitalists should consider implementing. The spectrum of patient safety problems varies from hospital to hospital, as do the resources available to tackle quality improvement in general. Thus, hospitalists should carefully prioritize the patient safety initiatives they undertake, to avoid spending limited resources on projects that are difficult to implement or less likely to succeed.

The authors thus recommend that hospitalists choose a “balanced diet” of patient safety projects, starting with high-impact interventions that are easy to implement, along with interventions that will promote interprofessional collaboration and lay the groundwork for future projects. Thus, initial projects, such as preventing CRBSI and instituting structured discharge communications, combined with a momentum-generating project such as executive walk rounds, should provide immediate clinical benefits and improve the culture of safety and climate for future interventions. They also strongly believe that hospitalists should be involved in hospital-wide interventions that will affect their day-to-day practice, such as implementation of CPOE.

The authors prioritized interventions that target common patient safety problems, according to a framework that also takes into account the strength of evidence supporting the intervention, the ease and cost of implementation, the potential for unintended consequences, and the potential for the intervention to promote other patient safety projects. They did not specifically recommend several interventions that, although commonly used, provide fewer benefits for patients in relation to the effort required to implement and perform them. These include medication reconciliation, incident
reporting, and RCA. Although each of these interventions may be beneficial in specific patients or groups of patients, the authors believe that, in the setting of limited time and resources, hospitalists should prioritize their involvement in other interventions.

Hospitalists should be aware that the field of patient safety is changing rapidly, and interventions that were highly recommended as recently as a few years ago are now considered to be of questionable benefit. Several print and Web-based resources are available for those interested in staying current in the field. The AHRQ’s Web sites WebM&M (webmm.ahrq.gov) and Patient Safety Net (psnet.ahrq.gov) are respectively a case-based journal and an annotated library dedicated to patient safety resources and education. The Veterans Affairs National Patient Safety Center Web site (www.patientsafety.gov) also includes practical patient safety resources and educational material, including detailed information on performing RCA. Organizations dedicated to patient safety, such as the Institute for Healthcare Improvement and the National Patient Safety Foundation, also carry out programs centered on patient safety education, leadership, and inpatient quality improvement.

References


