

Yisrael M. Safeek, MD, MBA

## protocols, prompters, bundles, checklists, and triggers **synopsis of a preventable mortality reduction strategy**

A hospital's senior finance leader can play an important role in the organization's effort to prevent avoidable deaths by monitoring the monetary impact of substandard care and driving the focus on key leverage points.

### AT A GLANCE

An improvement strategy focused on preventing avoidable patient mortality should target the following leverage points:

- > The Joint Commission's National Patient Safety Goals
- > CMS's core measures
- > Prevention of health-care-associated infections, CMS's "never events," and adverse drug events

Preventable mortality has become a prevailing headache for most hospitals. In 2007, the Centers for Medicare & Medicaid Services (CMS) began reporting 30-day mortality on its Hospital Compare website for acute myocardial infarction (AMI) and heart failure.<sup>a</sup> In 2008, CMS added mortality rates for pneumonia and now classifies hospitals as "better," "no different," or "worse." In 2009, HealthGrades reviewed 41 million CMS hospitalizations over the years 2004 to 2006 at the nation's approximately 5,000 hospitals. HealthGrades found that 152,666 lives could have been saved and 11,772 major complications avoided during the years studied.

### Priorities of Transformation

Attempts to reduce avoidable patient deaths (preventable defects) must rest with the desire to embrace hospital mortality as a priority and an urgent systems-level aim. Only when leaders realize that what is permitted is what is promoted will compliance replace complacency and zero preventable deaths become attainable. Now, more than ever, care coordination and patient safety has an effect on a hospital's financial health. Today's limited health-care dollars have forced payers such as CMS, Aetna, Blue Cross, Cigna, and others to simply stop paying for preventable conditions.

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a. Jha, A.K., Orav, A.K., Li, Z.H., and Epstein, A.M., "The Inverse Relationship Between Mortality Rates and Performance in the Hospital Quality Alliance Measures," *Health Affairs*, July/August 2007.

See lists of CMS's core measures and current "never events" at [www.hfma.org/hfm](http://www.hfma.org/hfm).

The logical place to build improvement would be through an executable strategy that targets certain leverage points. The leverage points are evidence-based solutions like The Joint Commission’s National Patient Safety Goals (NPSG) and the CMS core measures. They also include prevention of healthcare-associated infections (HAIs), CMS’s “never events,” and adverse drug events (ADEs).

This approach involves reengineering of systems of care, process standardization, physician alignment, and coalitions of high-performance, transformation teams. Potential members of the transformation team should include, in the very least, representatives from quality and performance improvement, physicians, and nursing. Most important, the team should include someone who focuses on the financial health of the organization. This financial expert, usually the CFO, would contribute by monitoring the monetary impact of substandard care and driving the leverage points more profoundly.

Each of these leverage points represents individual measures that by themselves reduce mortality, but when used together work in a synergistic manner to have a more profound effect. For example, deaths from sepsis can be avoided by adherence to The Joint Commission’s NPSGs alone, but adding CMS’s core measures offers a more comprehensive approach.

### The Joint Commission’s NPSGs

The NPSGs highlight certain problematic areas in health care and offers expert-based solutions to them. The 2009 goals themselves are requirements that focus on systemwide issues that directly contribute to mortality. To get the maximum benefit of the NPSGs, healthcare organizations need to institute mandatory protocols rather than just suggested guidelines. Indeed, this consideration applies even to the commission’s recommended protocols for prevention of pneumococcal and influenza infections as well other HAIs.

These protocols should address who, when, where, and how for every NPSG. For example,

### TOOLS AND TACTICS OF AVOIDABLE MORTALITY REDUCTION

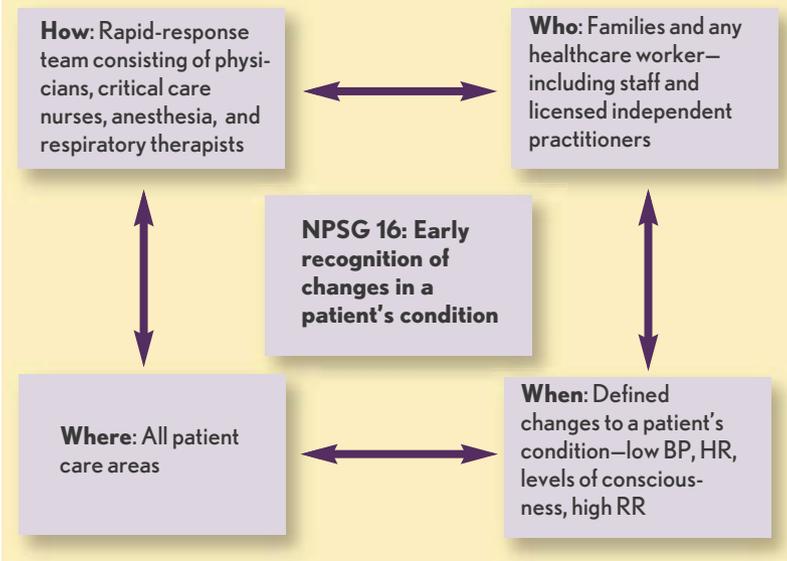
Leverage Point	Tactic
1. National Patient Safety Goals	Protocols: To address who does it? When? Where? How is it validated?
2. Core measures	Prompters: Standardized order sets, progress notes prompting required documentation
3. Hospital-acquired infections, sepsis	Bundles: Small, straightforward sets to mistake-proof and support standardized work
4. “Never events”—unnecessary blood transfusions, glycemic control, surgical complications	Checklists: To address sequence, timing, and location of value-added steps
5. Adverse drug events	Triggers: Computerized algorithms/ lists of clues

### The Joint Commission’s National Patient Safety Goals

- Goal 1.** Improve the accuracy of patient identification.
- Goal 2.** Improve the effectiveness of communication among caregivers.
- Goal 3.** Improve the safety of using medications.
- Goal 7.** Reduce the risk of healthcare-associated infections.
- Goal 8.** Accurately and completely reconcile medications across the continuum of care.
- Goal 9.** Reduce the risk of patient harm resulting from falls.
- Goal 10.** Reduce the risk of influenza and pneumococcal disease in older adults.
- Goal 11.** Reduce the risk of surgical fires.
- Goal 13.** Encourage patients’ active involvement in their own care as a safety strategy.
- Goals 14.** Prevent healthcare-associated pressure ulcers.
- Goal 15.** The organization identifies safety risks inherent in its patient population.
- Goal 16.** Improve recognition and response in a patient’s condition.
- Universal Protocol.** Prevent treatment of the wrong person, use of wrong site, and/or use of the wrong surgical procedure.

NPSG 16 deals with timely recognition and intervention of patient’s declining condition. It has been shown that earlier detection (within six hours) of a patient’s deteriorating condition can decrease mortality due to timelier medical interventions. Early recognition of premonitory conditions such as a 30 percent increase in the heart rate, a 30 percent decrease in the blood pressure,

**PROTOCOL FOR THE JOINT COMMISSION'S NATIONAL PATIENT SAFETY GOAL NO. 16**



**PROMPTER FOR A CMS CORE MEASURE**

**AMI PROMPTER**

The patient has the diagnosis of chest pain or acute myocardial infarction (AMI).

Additional documentation/orders are needed.

- LVEF needs documented or ECHO needs to be ordered to assess left ventricular function.
- ACE/ARB needs to be ordered. Your patient's Ejection Fraction is \_\_\_\_\_. *If this is not possible, please document in the chart why these drugs are not indicated.*
- Lipid panel needs to be ordered for this patient. *If you have checked this patient's lipids as an outpatient, please document the results in the medical record.*
- Lipid-lowering agent is indicated for this patient. Your patient's LDL/Cholesterol level is \_\_\_\_\_. *If contraindicated, please document the reason in the chart.*
- ASA is indicated for this patient. *If contraindicated, please document the reason in the chart.*
- Beta-blocker is indicated for this patient. *If contraindicated, please document reason in the chart.*

or a depressed level of consciousness can trigger an alarm and circumvent a “failure to rescue.” An effective tactic to use for this NPSG requires a protocol, as shown in the exhibit above. Similar protocols should be planned, developed, tested, and implemented for each NPSG. Teams should monitor compliance for each protocol and intervene when there is special cause variation.

**CMS Core Measures**

The CMS core measures, nationally accepted performance measures that are being used to track hospital mortality rates, can also be recruited as potent tools to decrease avoidable hospital deaths in heart failure, AMI, and pneumonia. According to HealthGrades, hospitals in the top quartile of performance of core measures had 11 percent lower mortality for AMI, 7 percent lower for heart failure, 15 percent lower for pneumonia, and 8 percent lower for surgery. (For a list of CMS core measures, go to [www.hfma.org/hfm](http://www.hfma.org/hfm).)

A technique to get the most of the core measures is to embed them concurrently into routine clinical workflow by way of prompters. These prompters are no more than strategically placed physician order entry sets, as shown in the exhibit below left. Placement of prompters while patients are still in the hospital can augment uniform documentation during stay, and act as standardized order sets at admission/discharge. They can also be used to educate front liners thus allowing ownership of care processes. By being real-time, there is an opportunity for improved patient care through improved practice patterns.

**HAIs**

Certain HAIs contribute directly to mortality. The Centers for Disease Control and Prevention (CDC) estimates that nearly 2 million patients (5 to 10 percent of hospitalized patients) experience an HAI each year, leading to almost 100,000 deaths and \$4.5 billion to \$6.5 billion in extra costs. A number of factors contribute to this problem, including increasing rates of antimicrobial resistance, progressively more complex medical procedures, and invasive medical technology that place patients at risk for procedure or device-related infections. It has been shown that sepsis alone accounts for 30 to 50 percent of in-hospital mortalities. When shock is present, mortality is even higher at 50 to 60 percent.

According to the Institute for Healthcare Improvement (IHI), tackling HAIs requires “a group of interventions related to a disease process that, when executed together, result in

better outcomes than when implemented individually” ([www.ihl.org/IHI/Topics/CriticalCare/IntensiveCare/Changes](http://www.ihl.org/IHI/Topics/CriticalCare/IntensiveCare/Changes)). This idea forms the basis for the bundles described by IHI, which are intended to ensure that the treatment approach is consistent every time. Take the sepsis bundle: It involves measurement of serum lactate, blood cultures prior to antibiotics, antibiotics within three hours, and aggressive treatment of hypotension with fluids and vasopressors. There are also other examples of bundles designed for prevention of central line infections, ventilator-associated pneumonias, and urinary tract infections.

### Never Events

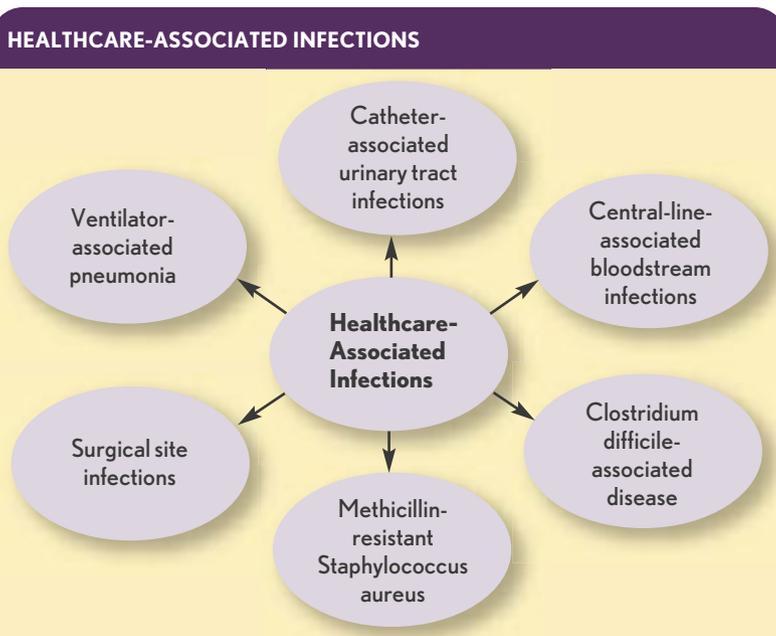
In 2002, the National Quality Forum (NQF) identified 27 adverse “never events”—i.e., preventable mistakes that are so serious they should never happen. In 2008, CMS incorporated selected measures into its list of hospital-acquired conditions, which accounted for \$9.3 billion in excess charges and 32,600 preventable deaths. (For a list of CMS’s current “never events” go to [www.hfma.org/hfm](http://www.hfma.org/hfm).)

To prevent aviation disasters, pilots successfully use checklists to verify that several critical procedural elements are correctly accomplished. Borrowing from the airline industry, checklists can help decrease mortality from falls, pressure ulcers, wrong person, wrong site, and wrong procedure surgeries.

For example, patient falls are high-risk, high-volume, and carry a high mortality rate (e.g., hip fractures are associated with 24 percent mortality within a year). A memorable checklist can serve as a successful mitigation strategy. For example, the use of the easy-to-remember mnemonics such as “DON’T SPLAT,” shown in the exhibit on page 74, can help focus the falls assessment for vulnerable patients and initiate prevention steps. The exhibit also shows examples of mnemonics for wrong surgeries (“I AM FOR SAFETY”) and decubitus prevention (“SAFE SKIN”).

### Adverse Drug Events

According to the Agency for Healthcare Research



### BUNDLES FOR HEALTHCARE-ASSOCIATED INFECTIONS (HAIs)

Ventilator-Associated Pneumonia Bundle*	Central Line Bundle*	Sepsis Bundle*	UTI Bundle†
30 degree head of bed	CDC hand hygiene	CDC hand hygiene	CDC hand hygiene
Sedation holidays	2 percent chlorhexidine for skin prep	Fluids/vasopressors to maintain blood pressure	Sterile catheter insertion
Peptic ulcer disease prophylaxis	Avoidance of groin lines	Timely blood cultures and antibiotics	Secure and maintain a closed system
Deep venous thrombosis prophylaxis	Use of caps, face mask, gowns, drapes	Low dose steroids	Perineal care
Constant assessment to extubate	Daily review of catheter need, and earliest removal	Tight glycemic control with insulin drips	Daily review of catheter need, and earliest removal

\*Adapted from the Institute for Healthcare Improvement.  
†Created by the author.

and Quality (AHRQ), more than 770,000 people are injured or die each year in hospitals from ADEs, which cost up to \$5.6 million each year per hospital. This estimate does not include admissions, malpractice, and litigation costs resulting

CHECKLISTS FOR "NEVER EVENTS"		
<b>Falls*</b> <b>"DON'T SPLAT"</b> Diuretics use Orient patient to setting Nonskid footwear Trauma alert—post falls signs Side rails up Position change alarms Lowest bed position Activate bed alarms Teach patients and families	<b>Safe Surgery†</b> <b>"I AM FOR SAFETY"</b> Identifiers X 2 Allergies Medication reconciliation Fasting status Oxygen pulse ox Risk of >500ml blood loss? Site markings Anesthesia airway risk Fluids and antibiotics started Equipment available? Timeout pause Yield of final count, specimen	<b>Decubitus*</b> <b>"SAFE SKIN"</b> Skin inspection Assess Braden scale Friction reduction padding Educate patients and families Standardized beds, mattresses Keep pressure off prominence Incontinence care Nutritional screen, prealbumin

\*Created by the author.  
 †Adapted from World Health Organization checklist.

from ADEs, or the costs of injuries to patients. National hospital expenses to treat patients who suffer ADEs are estimated at between \$1.56 billion and \$5.6 billion annually.

According to AHRQ, about 42 to 60 percent of ADEs are due to excessive drug dosage for the patient's age, weight, underlying condition, and renal function ([www.ahrq.gov/qual](http://www.ahrq.gov/qual)). Further, ADEs can be prevented by identifying process gaps in the medication management system (see the exhibit above). These gaps could be present at computerized provider order entry (CPOE), automated dispensing cabinets (ADC), and coding or radio frequency identification (RFID).

A common technique that has been used to identify and prevent ADEs is the use of triggers—i.e., lists of metrics that can detect ADEs through

medication interactions, incorrect medication dosages for the patient's age or weight, inappropriate dosage frequencies, and patient allergies. Algorithms can be programmed within computer systems to cross-check databases containing patient information such as demographics, physicians' orders, drug allergies, as well as radiology and lab results. Computerized surveillance can prompt pharmacy to initiate interventions to mitigate and lessen the severity of any reactions.

In the absence of computerized scrutiny, a manual trigger can be used as an adaptable sampling technique as part of a retrospective tool to identify causes of drug reactions.<sup>b</sup> An example is the

b. "Adverse Drug Event Trigger Tool: A Practical Methodology for Measuring Medication Related Harm," *Quality & Safety in Health Care*, June 2003, pp. 194-200.

**COMPONENTS OF A MEDICATION SYSTEM**



IHI trigger tool, which lists predetermined clues that can be applied to a random sample of hospital charts to review discharge summaries, physicians' orders, and laboratory values. When a trigger is discovered, the pertinent part of the chart is explored to see if an ADE has occurred.

**Monitoring and Managing**

Following successful implementation of the strategy, all hospital mortalities should be reviewed from a systems perspective using the "Failure Tally." It should be performed as part of a root cause analysis to identify factors contributing to poor performance. The review should focus on any of the causes ("Failure to Anticipate," "Failure to Activate," and "Failure to Resuscitate") that led to delayed, omitted, or inappropriate treatments. Any of the failures should be monitored through multidisciplinary rounds, informally called "huddles." These huddles translate into discussion with intensivists, social workers, case managers, technicians, nurses, and senior leaders about the absence of important aspects of care for patients in the intensive care unit.

Examples of "Failure to Anticipate" include failure to apply the protocols, prompters, bundles, and checklists in situations of high probability. Examples of "Failure to Activate" include failure to use the tools even after a specific condition or diagnosis has been made. Examples of "Failure to Resuscitate" include ineffective use of the tools when the required condition is present. For avoidable mortality reduction to be sustainable, areas of noncompliance should be identified, rectified, and tracked as performance reports. Only then can the goal of zero preventable mortality become a reality.

In the final analysis, any organization that improves patient safety will also decrease rework (by reducing special cause variation), and improve the bottom line. Hospitals that improve the well-being of patients also enhance their own financial well-being. ●

**TRIGGER FOR ADVERSE DRUG EVENTS (ADES)**

TRIGGER	ADE Y/N	HARM	Description of Event
<b>Triggers:</b>	1. Orders for antidotes (Benadryl, Narcan, Romazicon, Vitamin K, anti-emetics, anti-diarrheals) 2. Abnormal laboratory values (glucose <50, clostridium positive stool, PTT > 100, INR > 6, WBC < 3,000, platelet < 50, Digoxin > 2) 3. Abrupt medication stop orders 4. Transfers to a higher acuity of care 5. Development of a rash		
<b>Harm:</b>	1. Temporary injury 2. Permanent injury 3. Death		

Source: Adapted from the Institute for Healthcare Improvement.

**FAILURE TALLY**

Tool Involved	Unit	Shift	Circumstances
			> Failure to Anticipate > Failure to Activate > Failure to Resuscitate
NPSG Protocol			
Core Measure Prompter			
Infections/Sepsis Bundle			
Never Event Checklist			
Adverse Drug Reaction Trigger			

**About the author**



**Yisrael M. Safeek, MD, MBA, CPE, FACPE**  
 is President and CEO, The SafeCare Group,  
 Lexington, KY  
 (www.safecaregroup.com)

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