

Battling Healthcare-Associated Infections Through Public Accountability

EXECUTIVE SUMMARY

Infections that are acquired while in a healthcare setting—also known as healthcare-associated infections (HAIs)—have become recognized as a major problem, accounting for 100,000 deaths and \$6.7 billion in healthcare spending annually in the United States. Because most HAIs are preventable, there has been growing interest at the state and federal levels in public reporting as a strategy to build accountability and drive down infection rates. Although many hospitals have been systematically collecting data on infections for decades for internal quality assurance, and in collaboration with the Centers for Disease Control and Prevention (CDC) for surveillance purposes, public reporting of infection rates and infection prevention measures is relatively new and uncharted territory. This Issue Brief describes current reporting efforts intended to promote accountability concerning HAIs and discusses some of the challenges raised by these initiatives.

HAIs and Public Reporting

Millions of HAIs occur each year in the United States; recent estimates indicate that approximately 1.7 million infections from HAIs occur each year in U.S. hospitals.¹ But patients are at risk of HAIs in any care environment in which the protective layer of skin or organs are breached, such as by central lines or surgical procedures. For this reason, it should come as no surprise that the highest prevalence of HAIs is found in intensive care units. HAIs also occur in long-term care facilities, dialysis centers, ambulatory surgical centers, and home care settings (see box 1). The most common types of HAIs are urinary tract infections, surgical site infections, central line-associated bloodstream infections, and ventilator-associated pneumonia (VAP).

HAIs are no longer seen as an inevitable cost of treating seriously ill or susceptible patients; these infections are now viewed as largely preventable. As of October 1, 2008, the Centers for Medicare & Medicaid Services (CMS) will no longer pay for additional hospital expenses resulting from some infections acquired during a hospital stay, and many private purchasers have similar policies.²

Moreover, with growing media attention and public awareness of the problem, policymakers have taken action

➔ *Continued on page 2*

by spearheading public reporting initiatives. Public reporting on HAIs is intended to inform decisions by many stakeholders, including consumers seeking care, practitioners making referrals, providers engaged in benchmarking to improve quality, purchasers and insurers designing and administering health benefit plans, and organizations engaged in quality oversight.

To date, 22 states have enacted legislation requiring public reporting of HAIs, and 4 (Florida, Missouri, Pennsylvania, and Vermont) already have begun posting data.³ New York and South Carolina are currently piloting public reporting systems. Colorado is scheduled to issue its first report in July 2008. Most other states have considered hospital infection reporting laws. In addition, national organizations—including CMS, the Joint Commission, and the Leapfrog Group—have included measures of HAI prevention and other rate-based measures, such as urinary tract infections, in their voluntary public reporting initiatives. But while momentum is growing to promote public accountability concerning HAIs, considerable controversy remains regarding what information to report and how to make that information useful to consumers. NQF recently endorsed a set of 7 new measures for a total of 20 HAI-related NQF-endorsed™ measures. These measures are intended to provide guidance to policymakers looking to publicly report on HAIs (see table 1).

The demand for greater transparency and accountability for HAIs is likely to continue to grow. The recent spate of Methicillin-resistant *Staphylococcus aureus* (MRSA) outbreaks in a variety of communities has spurred a renewed public interest in mandatory reporting of HAIs. The Consumers Union has launched a nationwide campaign, Stop Hospital Infections, which encourages consumers to lobby their congressional representatives to support bills pending in both the House and Senate that would mandate public reporting of hospital infection rates.⁴ The campaign's slogan, "End hospital secrecy and save lives," reflects the public's widely held perception that there is a

BOX 1

HAIs and Healthcare Settings of Concern

An HAI is a local or systemic infection that occurs in a patient in a healthcare setting and that can be demonstrated on the basis of timing to not have been active or incubating when the patient entered that healthcare setting. In other words, it is an infection that is believed to arise from exposure to infectious organisms encountered in the healthcare setting.

Healthcare settings of concern for HAIs:

Hospitals—particularly adult, child, and newborn intensive care units, as well as surgical settings—in fact, any setting in which the protective layer of patients' skin is commonly breached is of concern for HAIs.

Long-term care facilities—although data are limited in these settings, the burden of infection is believed to equal or exceed that in hospitals.*

Dialysis centers—chronic hemodialysis patients are at higher risk of HAIs than the average hospital patient because of frequent exposure to vascular access devices, in addition to increased susceptibility.

Ambulatory surgical centers—although HAIs are difficult to detect in ambulatory settings, and are likely to be less common than in inpatient surgical settings, a substantial proportion of surgical procedures in the United States currently are performed in ambulatory surgical centers.

Home care—an increasing proportion of healthcare is shifting to the home; in 1996, 10 percent of patients receiving home health care had an indwelling medical device, putting them at risk of infection.

*Strausbaugh LJ, Joseph CL. The burden of infection in long-term care. *Infect Control Hosp Epidemiol*, 2000;21:674-679.

TABLE 1

NQF-Endorsed Measures of HAIs

Intravascular Catheter-Associated Bloodstream Infections

- Central line bundle compliance**
- Central line-associated blood stream infections
- Cardiac surgery patients with controlled 6 am postoperative serum glucose
- Surgical site infection rate
- Surgery patients with appropriate hair removal

Surgical Site Infections

- Prophylactic antibiotic received within one hour prior to surgical incision
- Prophylactic antibiotic selection for surgical patients
- Prophylactic antibiotics discontinued within 24 hours after surgery end time (48 hours for CABG and other cardiac surgery)
- Deep sternal wound infection rates for CABG
- Postoperative sepsis

Catheter-Associated Urinary Tract Infections

- Urinary catheter-associated urinary tract infection for ICU patients

Ventilator-Associated Pneumonia and Respiratory Illness

- Ventilator bundle***
- Ventilator-associated pneumonia rates in ICU and high-risk nursery patients

Healthcare-Associated Infections in Pediatric Populations

- Late sepsis or meningitis in neonates
- Late sepsis or meningitis in very low birth weight neonates

Clinical Level Perioperative Care

- Timing of prophylactic antibiotics, ordering physician
- Timing of prophylactic antibiotics, administering physician
- Selection of prophylactic antibiotic, first- and second-generation cephalosporin
- Discontinuation of prophylactic antibiotics, non-cardiac procedures
- Discontinuation of prophylactic antibiotics, cardiac procedures

** Aligns with NQF-endorsed Safe Practices 20 and 22.

*** Aligns with NQF-endorsed Safe Practice 19.

direct correlation between the transparent reporting of infection rates and the overall health of the community at large.

Current HAI Reporting Initiatives

The four states that are currently publicly reporting HAI rates have taken similar approaches to the measures used, data sources, settings on which they reported, and risk adjustment, all shaped by public laws in the respective states (see table 2).

In terms of the infection rate measures, all four states report on central line-associated bloodstream infections. Three of the four states report on surgical site infection rates; Vermont is the exception, because it reports instead on the appropriate use of antibiotics to prevent infections following surgery. Pennsylvania also reports on urinary tract infections and pneumonias caused by devices such as intravenous line, catheters, and ventilator assistance, as well as those caused by non-device infections.

All four states report on hospitals, and one also reports on ambulatory surgical

centers. None of the four states currently report on other settings, such as long-term care, home care, and dialysis centers. In terms of data used to generate the measures, three out of the four states use hospital-generated reports, and one uses billing data.

The one area where all states differ is in the approach to risk adjustment. Florida uses patient demographic data, such as age and gender, along with diagnostic groups for specific conditions or procedures to estimate what the rate would have been if the hospital had a mix of patients similar to the national average patient mix and then compares the actual with the estimated rates. Missouri provides risk adjustment only for surgical site infections based on ratings of the degree of contamination of the wound, the patient's condition, and the duration of the procedure. Pennsylvania provides hospital comparisons of infection rates for hospitals with similar complexity, called "peer groups," based on the percent of surgical procedures performed, the number of patients treated, and the use of electronic hospital-acquired infection surveillance systems. Vermont does not risk

adjust its rates, but compares hospitals based on one of three types of intensive care units.

At the federal level, CMS publicly reports data on HAIs in hospital and long-term care settings through its Hospital Compare web site and in nursing homes through the Nursing Home Compare web site. Hospital and long-term care facilities report on three measures related to the prevention of surgical infections through the prophylactic use of antibiotics that are part of the national Surgical Care Improvement Project (SCIP). Nursing home measures related to HAIs include the percentage of patients with urinary tract infections and the percentage of patients with pressure sores. Although reporting on these sites is voluntary, full Medicare reimbursement is contingent upon participation, and participation rates are very high for hospitals.

The Joint Commission includes the SCIP measure on antibiotic prophylaxis⁵ as one of the measures on which organizations can choose to publicly report through QualityCheck, a database for consumers that provides performance measurement

TABLE 2 Current State HAI Reporting Initiatives

State	Infection Rate Measures	Data Source(s)	Settings	Risk Adjusted
Florida (a)(b)	<ul style="list-style-type: none"> Infections related to the use of intravenous lines and catheters Postoperative sepsis (infections following surgery) 	Administrative claims	Hospitals	Patient demographics and diagnostic codes
Missouri (b)(c)	<ul style="list-style-type: none"> Central line-associated bloodstream Surgical site infections (SSIs) 	Hospital and ambulatory surgical center reports	Hospitals Ambulatory surgical centers	For SSI (degree of contamination of wound and patient condition, and duration of procedure)
Pennsylvania (b)(d)	<ul style="list-style-type: none"> Urinary tract infections SSIs Pneumonias Bloodstream infections Multiple infections 	Hospital reports, supported by administrative billing information	Hospitals	Peer group hospital comparisons
Vermont (b)(e)	<ul style="list-style-type: none"> Surgical infection prevention Appropriate use of prophylactic antibiotics Central line-associated bloodstream infections 	Hospital reports	Hospital intensive care units	Intensive care unit type comparisons

(a) www.floridahealthfinder.gov/CompareCare/SelectChoice.aspx

(b) www.consumersunion.org/campaigns/learn_more_background/003544indiv.html

(c) www.dhss.mo.gov/HAI

(d) www.phc4.org/reports/hai/05/default.htm

(e) www.bishca.state.vt.us/HcaDiv/HRAP_Act53/HRC_BISHCAcomparison_2007/index_BISHCA_HRC_compar_menu_2007.htm



information on Joint Commission-accredited institutions as well as those that are not accredited. It also publicly reports on HAIs as part of the National Patient Safety Goals, which include goals concerning appropriate handwashing procedures and managing all HAIs as sentinel events.⁶

The Leapfrog Group, a non-profit organization that produces safety and quality report cards on hospitals based on voluntary self-reporting, reports HAI-related information based on NQF's safe practices. Safe practices of direct relevance to HAI prevention include those used to prevent surgical site infections, VAP, and central venous catheter-associated bloodstream infections. Leapfrog survey results are available online⁷ and are also made available as consumer tools by insurers and health plans.

Improving Measurement and Reporting

What to measure and how to report on HAIs has been an ongoing challenge. HAI measures can describe the actual rates of infection, such as blood stream infections; the processes of care to prevent infections, such as preventive antibiotic treatment for surgeries; or outcomes related to infections, such as VAP mortality. Each approach has its own proponents. For example, consumers prefer “bottom line” outcomes, such as actual infection rates and mortality rates that can be used to compare providers and settings. Providers prefer process measures because these can be helpful to improve practice and responsibility and accountability for the care is relatively clear. Quality measurement methodologists prefer well-validated measures and precise data. Most of the publicly reported HAI measures are either infection rates or processes of care. The relatively slow adoption and use of outcome measures is not unique to HAIs and is evident for most areas of quality measurement. As public reporting becomes more prevalent and more consumer friendly, there will be more demand for outcome measures.

Comparing infection rates across facilities can be complicated because of a number of factors, including the detection and attribution of infections that may develop after patients leave a facility, in another facility, or in the community before admission. There also may be differences in patient severity and demographics; provider differences, including the type and size of intensive care units; and differences in how providers look for and define infections, such as the use of electronic reporting systems. Risk adjustment is the standard tool used to account for these differences; however, it cannot ensure that HAI rates are fully comparable, because unmeasured underlying differences between facilities may still remain.

Collecting data on HAIs can be expensive in terms of the staff time used for surveillance, laboratory verification, and data processing. This underscores the importance of harmonizing measures that are collected by different organizations with one another in order to avoid adding unnecessarily to this burden. More and more, reporting on HAIs has become a way to drive improvement and reduce costs associated with unnecessary care resulting from infections, as well as from malpractice suits.

Information technology may be a cost-effective investment to help with the collection of HAI data. Some states working toward the public reporting of HAI rates are adopting the use of CDC's National Healthcare Safety Network (NHSN) system for automated reporting (see box 2). There also are several proprietary automated surveillance systems available, including MedMined,^{TM8} Infection MonitorPro (IMPro),⁹ SafetySurveillor,^{TM10} and ICNet.¹¹ Many smaller hospitals that experience fewer HAIs are opting for a manual method.

Validation of data before reporting to the public is important. The Healthcare Infection Control Practices Advisory Committee (HICPAC) recommends that planning and oversight of public reporting be monitored by a multidisciplinary group

BOX 2 CDC and HAIs

CDC collects data on HAIs mainly for surveillance, not for public reporting. The agency does not publicly report the HAI rates. However, as states implement mandatory HAI reporting programs, CDC's role has expanded to include a training and support function, helping providers standardize procedures in order to make infection rates more easily interpretable by consumers.

CDC has played a central role in surveillance for HAIs since the 1970s and has developed most of the surveillance tools that hospitals use to produce data for infection reporting. The new system that hospitals are using to collect HAI data is evolving into the NHSN, formerly known as the National Nosocomial Infection Surveillance System (NNIS). The NNIS and NHSN programs are voluntary; few hospitals (under 300) participated originally, but many more are expected to participate in NHSN because of state-mandated public reporting programs. Infection rates (central line-associated infections, urinary tract infections, VAP, and surgical site infections) are reported in the NHSN on the basis of hospital units for comparability, as opposed to at the level of the whole hospital. Ambulatory surgical facilities also may use the NHSN, although the application is not designed for them.

of public health officials and experts, providers, and consumers. Auditing or verification of publicly reported HAI data by third parties could help reduce the risk of inaccurate reporting.

Taking Action to Reduce HAIs

Although the national rate of hospital-acquired infections has not decreased, according to the Agency for Healthcare Research and Quality's most recent *2007 National Healthcare Quality Report*,¹² there are many examples where HAIs have been reduced substantially.

Recent research suggests that the most effective methods of eliminating HAIs may be simple, localized, and hospital

BOX 3 NQF-Endorsed Safe Practices That Relate to HAIs

Of the 30 NQF-endorsed safe practices, as updated in 2006, the following 5 practices relate to HAIs:

- **Safe Practice 19:** Aspiration and Ventilator-Associated Pneumonia Prevention
- **Safe Practice 20:** Central Venous Catheter-Associated Bloodstream Infection Prevention
- **Safe Practice 21:** Surgical Site Infection Prevention
- **Safe Practice 22:** Hand Hygiene
- **Safe Practice 23:** Influenza Prevention

centered. A number of excellent results have emerged through individual hospital's participation in the Institute for Healthcare Improvement's (IHI's) 5 Million Lives campaign. In particular, several "mentor hospitals" have produced initial exciting results. For example, through the implementation of several of the IHI "bundles," Henry Ford Hospital in Detroit has reduced surgical site infection rates more than 50 percent, while the adoption of the surgical bundle by the Indiana Heart Hospital reduced the cardiovascular surgery sternal wound infection rate by 50 percent in its first year alone.¹³

Provonost's research, conducted in Michigan hospitals over a four-year period, demonstrated that the use of a simple, five-step checklist by intensive care unit medical personnel can rapidly and effectively reduce the number of HAIs to zero.¹⁴ With increased recognition of the need to prevent HAIs, many efforts are under way to enhance safety and quality. For example, the Association of Professionals in Infection Control recently launched a new publication, *Prevention Strategist*, dedicated to the sharing of "front-line, tested strategies that infection prevention and control professionals can use to reduce healthcare-associated infections."¹⁵

NQF has endorsed 30 safe practices for hospitals, 5 of which are related to HAIs (see box 3). Through the efforts of the Texas Medical Institute of Technology and the Leapfrog Group, these practices are now in use in approximately 1,200 hospitals nationwide.¹⁶

At the same time, a variety of efforts are under way in parallel with public reporting efforts to help providers prevent HAIs. In 2005, the Patient Safety and Quality Improvement Act (P.L. 109-41) was signed into law to establish Patient Safety Organizations (PSOs). The goal of these organizations is to "improve patient safety by encouraging voluntary and confidential reporting of events that adversely affect patients."¹⁷ Noting that under-reporting of adverse events often occurs because of fear of discovery (i.e., event reports can be used in malpractice cases), a PSO would enable the confidential reporting of data and subsequently provide an interactive evidence-based resource for providers and others to support prevention based on the data analysis.

CMS's Quality Improvement Organizations are charged with providing education on HAI prevention practices and supporting healthcare providers at a regional level. The National Patient Safety Foundation, along with the American Hospital Association and the American Medical Association, has developed materials for the consumer to help empower patients to take on their role in preventing infections. IHI has made VAP prevention a continued focal point of its 5 Million Lives campaign, helping hospitals implement a bundle of techniques to prevent VAP and conditions related to ventilator use. In addition, NQF's safe practices serve as a tool for healthcare providers, purchasers, and consumers to identify and encourage processes of care that are likely to reduce errors and improve health outcomes.

NQF

NATIONAL QUALITY FORUM

NQF's mission is to improve the quality of American healthcare by setting national priorities and goals for performance improvement, endorsing national consensus standards for measuring and publicly reporting on performance, and promoting the attainment of national goals through education and outreach programs.

NQF Issue Briefs provide insight into payer, policy, and industry efforts to promote quality healthcare and are produced with sustaining support from the Cardinal Health Foundation. Additional support is provided by sanofi-aventis.

This publication series is part of NQF's education and outreach initiative *Navigating Quality Forward*.

NATIONAL QUALITY FORUM

601 Thirteenth Street, NW
Suite 500 North
Washington, D.C. 20005
202.783.1300 Tel
202.783.3434 Fax
www.qualityforum.org

Issue Brief No. 9
April 2008

Looking Forward

HAIs are one of a handful of areas identified by NQF's National Priorities Partnership (NPP) initiative. NPP is a coalition of 27 major national organizations engaged in a process of identifying a limited set of national priorities for quality measurement and improvement.¹⁸ For HAIs, the NPP is now working to identify goals for measurement, quality improvement, payment innovations, public reporting, and multistakeholder engagement.

With the guidance of these many organizations and the growing number of states with public reporting programs, new measures and improvement strategies should evolve and mature. The drive toward greater harmonization of measures across states and settings should help identify better improvement strategies and provide an opportunity to learn from leaders in the field. Given the promising early evidence that public reporting can have a positive impact on consumer and provider behavior in other areas, such as hospital care for heart disease and obstetrics, the rates of preventable HAIs should decline. ●

Acknowledgments

Information for this Issue Brief was gathered through interviews with leaders of national and state HAI reporting initiatives. Emily DeVoto and Sara Maddox, consultants to NQF, and NQF staff Cara Lesser, Marilyn Francis, Dwight McNeill, and Katharine Torrey contributed to this Issue Brief.

- 1 Klevens RM, Edwards JR, Richards CL, et al., Estimating health care-associated infections and deaths in U.S. hospitals, 2002, *Public Health Reports*, 2007;122:160-166.
- 2 See www.cms.hhs.gov/HospitalAcqCond.
- 3 See www.consumersunion.org/campaigns/CU%20Summ%20HAI%20state%20rpting%20laws%20as%20of%201-08.pdf.
- 4 See <https://secure.consumersunion.org/site/Advocacy?cmd=display&page=UserAction&id=1743>.

- 5 The measures address the appropriate use and administration of antibiotics before, during, and after surgery, as well as the right selection of antibiotic according to established medical practice guidelines.
- 6 See www.jointcommission.org/PatientSafety/NationalPatientSafetyGoals/07_npsg_facts.htm.
- 7 See www.leapfroggroup.org/for_consumers.
- 8 See www.cardinal.com/medmined.
- 9 See www.rl-solutions.com/%20%20%20index.php?option=com_content&Itemid=66&id=8&task=view.
- 10 See www.premierinc.com/quality-safety/tools-services/performance-suite/infectioncontrol.jsp.
- 11 See www.icnet.org.uk/aboutus.asp.
- 12 Agency for Healthcare Research and Quality (AHRQ), 2007 *National Healthcare Quality Report*, Rockville, MD: AHRQ; February 2008. AHRQ Pub. No. 08-0040.
- 13 See www.ihl.org/IHI/Programs/Campaign/mentor_registry_ssi.htm.
- 14 Provonost P, Needham D, Berenholtz S, et al., An intervention to decrease catheter-related bloodstream infections in the ICU, *N Engl J Med*, 2006;355:26:2725-2732.
- 15 See www.apic.org/AM/Template.cfm?Section=Featured_News_and_Events&CONTENTID=10586&TEMPLATE=/CM/ContentDisplay.cfm.
- 16 See www.leapfroggroup.org/media/file/Release_2007_Leapfrog_Survey_and_Top_Hospitals_9-18.pdf.
- 17 "Patient Safety and Quality Improvement Act of 2005" (P.L. 109-41) *United States at Large Statute*. 119 Stat. 424.
- 18 See www.qualityforum.org/about/NPP.