

COVER STORY

Hospital-Acquired Infections

Rates are far too high, and health plans are big losers. Is it time to institute financial penalties?

Joseph Burns

Contributing Editor



Almost immediately, hospitals could cut in half the number of infections that patients contract each year in health care facilities, but we lack the will or have failed to install the proper financial incentives to do so, experts say.

Instead of using payment penalties to drive down infection rates, health plans and government payers actually pay hospitals more to care for patients with hospital-acquired infections (HAIs), according to researchers at the Johns Hopkins Armstrong Institute for Patient Safety and Quality.

A recent study in JAMA Internal Medicine by researchers at the Center for Patient Safety Research and Practice at Brigham and Women's Hospital and at Harvard Medical School found that almost 441,000 patients contract one of five HAIs each year, and about 50% of these infections are avoidable. The five most common, costly, preventable, and well-tracked infections in hospitals are surgical site infection (SSI), central-line-associated blood-stream infection (CLABSI), catheter-associated urinary tract infection (CAUTI), ventilator-associated pneumonia (VAP), and Clostridium difficile infection (CDI). They added methicillin-resistant Staphylococcus aureus (MRSA) as a sub-category under SSIs and CLABSIs.

In effect, hospitals are infecting a population the size of Atlanta every year, says Leah Binder, president and CEO of the Leapfrog Group, an organization that issues a twice-a-year hospital safety score that grades efforts to address errors, accidents, injuries, and infections that harm or kill patients.

"A number of hospitals have improved by one or even two grades, indicating they're taking steps toward safer practices," she says. "But these efforts aren't enough."

Indeed, the hard part begins now, because some hospitals have been innovative early adopters of methods to limit HAIs, leaving behind stragglers that have yet to make infection control a priority, says John Santa, MD, medical director of Consumer Reports. The laggards may not have the desire or the necessary funding, or they may assume incorrectly that infections can happen to anyone, he adds.



"Hospitals don't even have to report all infections publicly, so the public has no idea how serious and prevalent they are," says John Santa, MD, of Consumer Reports Health Ratings Center. Most plans don't penalize based on HAI rates.

"Four years ago, the School of Public Health at the University of California-Berkeley predicted what we see happening," says Santa. "It said 200 to 300 hospitals would be getting to zero on multiple infections. But it also found that hundreds of hospitals were doing poorly financially, had serious leadership problems, and were not reducing the rate of hospital-acquired infections."

Today, some hospitals are approaching zero central-line and surgical-site infection

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rates, Santa reports, adding pointedly: “When it comes to patient safety — including infection rates, wrong-site surgery, and other common forms of patient harm — the only acceptable goal is zero.”

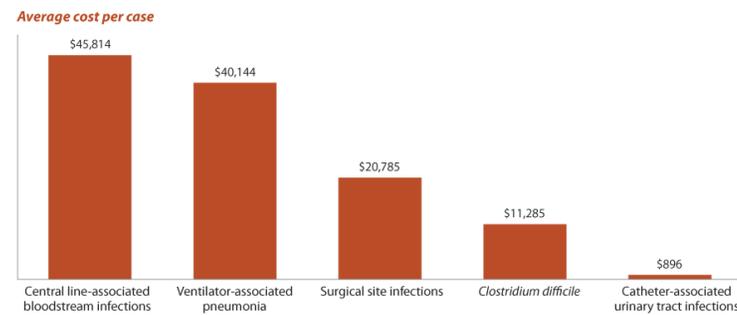
Nationally, according to the study published in September in JAMA Internal Medicine, we are not close to that goal.

In the 13 years since the Institute of Medicine published its famous report on patient harm, *To Err is Human: Building a Safer Health System*, U.S. hospitals are still far less safe than they should be. HAIs still account for a “large proportion of the harms caused by health care and high rates of morbidity, mortality, and costs,” the researchers wrote in JAMA Internal Medicine, “Health Care–Associated Infections. A Meta-Analysis of Costs and Financial Impact on the U.S. Health Care System.” They estimate that each year, there are 441,000 of those five common HAIs and the annual cost of treating patients with these infections is \$9.8 billion annually. (See “5 Costliest Hospital-Acquired Infections” below.)

5 costliest hospital-acquired infections

Together, these five cost the nation \$9.8 billion annually

Average cost per case



Source: Zimlichman et al. in JAMA Internal Medicine; Zimlichman et al. (<http://bit.ly/hcai-jama>)

So if these infections are costly and harmful to patients, why do they remain so common? One reason is that for consumers, patient safety is unrelated to cost, says Binder of the Leapfrog Group.



“We need consumers and purchasers saying that safety matters,” says Leah Binder, president and CEO of the Leapfrog Group. “That’s the only way that patient safety will get to the top of the hospital CEO’s agenda.”

“Some of the most expensive hospitals have poor safety records, and some of the least expensive have great safety records,” she says. “There’s no correlation between price and quality because we have not created a market for safety. Consumers have not been out there demanding it and telling their doctors it’s important to them. That’s what will do it.”

Santa agrees, saying some rates of HAIs (defined as any infection that patients acquire while receiving treatment for other conditions) remain high partly because of lack of attention. Some physicians and hospital administrators believe some infections are inevitable, he says. Also, hospitals earn more revenue when patients acquire infections in medical facilities, a recent study showed. (See “[How Hospitals Profit From Their Own Mistakes.](#)”)

Clearly, health insurers have an opportunity to control these costs while also improving patient care. “Insurance companies could and should prioritize safety in hospitals more than they are doing,” says Santa.

Ten years ago, Santa was on Oregon’s Public Employees Benefits Board, the largest health care purchaser in the state. “We tried to get our insurers to penalize hospitals that had high rates of never events. They would not do it, arguing instead that their priorities for contracting with hospitals were based on rates. They wanted the best rates, and any time they asked for any improvements in outcomes, we had to be

prepared to pay for it in terms of higher rates.”

Even today, HAIs aren’t considered never events, but they should be, Santa says. “Hospitals don’t even have to report all infections publicly, so the public has no idea how serious and prevalent they are,” he says. “And most health plans do not have explicit penalties for hospitals based on their HAI rates. But they should.”

‘It’s the incentives, stupid’

François de Brantes, executive director of the Health Care Incentives Improvement Institute, makes a similar point. “The methods of payment in use today actually provide an incentive for complications, which is crazy. Private sector plans would rather pay for complications than upset their provider networks by spending time discussing what’s avoidable and what’s not,” says de Brantes, author of *The Incentive Cure: The Real Relief for Health Care*.

“Clearly moving to bundled payments solves that problem, but because some infections materialize after discharge, you need to bundle the cost of the inpatient stay with the associated professional and post-acute costs to capture all costs associated with HAIs,” he says. “In Medicare payment, if the post-op infection requires a readmission, it gets tagged under the all-cause readmission rule and the facility gets penalized, but if the care is outpatient based, then Medicare just pays more for something that it shouldn’t pay for. Hence the importance of bundling.”

Blunt instrument

“But private sector payers continue to struggle with operationalizing bundled payments and use that as an excuse — among other reasons — to avoid taking any action,” de Brantes adds. “Certainly global capitation would help as well, but capitation is a blunt instrument that few organizations are willing or capable of implementing well.”

Health plans also should consider financial penalties. “Knocking a percentage off the hospital bill based on the occurrence of HAIs would be a simple payment incentive,” de Brantes suggests. “Health plans could calculate average HAI rates for a region, and then, for a specific hospital, subtract a percentage of fees based on the excess over average.

“All of these ideas are simple enough to implement, but the continued shift in the balance of negotiating power toward providers has led health plans to shy away from any payment policy that would institute penalties,” de Brantes says. “There’s also a failure by state governments to publicly shame hospitals into reducing HAIs. If states published every hospital’s HAI rate, they might force these facilities into improving.”

At the least, HAIs should be listed as never events, a step that would force U.S. hospitals to aim for zero infections, suggests Patrick R. Murray, PhD, the worldwide director of scientific affairs for BD Diagnostics. Murray cites statistics for methicillin-resistant *Staphylococcus aureus* (MRSA), which causes life-threatening bloodstream infections, pneumonia, and surgical site infections.

“When you look at the international data for infection rates from MRSA, the average in the United States is about 6.5% for all hospitalized patients,” says Murray. “In the best ICUs, it varies dramatically from 5% to 17%.” However, he adds, in some other countries — notably the Netherlands — that percentage is being driven down to zero.

“In Dutch hospitals, infections from multi-drug-resistant gram-negative organisms have been virtually eliminated,” he adds. “That’s because these institutions have established programs of rapid screening diagnostics for these organisms combined with very aggressive infection-control practices.”

Some hospitals in the United Kingdom are as bad as or worse than their counterparts in the United States in this regard, yet other U.K. hospitals’ experience mimics that of hospitals in the Netherlands. “This suggests that you can control these diseases,” Murray says.

As Santa theorizes, better results come from making the elimination of HAIs a goal. Kaiser Permanente consistently ranks among the best in the nation in Consumer Reports’ scoring of hospitals because the health plan makes it a priority to reduce HAIs, he says. (Kaiser’s hospitals all earned A’s on Leapfrog’s last hospital safety score rankings, as well.)

Kaiser Permanente has an advantage over other health plans because it owns most of the hospitals in its networks, “but that doesn’t mean employers and health plans

shouldn't expect the same thing," he says. "Employers should not say, 'It's OK for more of our employees to die in your facilities because you can't manage as well as Kaiser does.'"

Kaiser's role

Sue Barnes, RN, Kaiser's national leader for infection prevention and control, says that one of the primary responsibilities for all staff members in all of Kaiser's facilities is prevention and control of HAIs. KP has 9 million members, 37 hospitals, and 588 medical office buildings in seven states and the District of Columbia and performs 149,000 inpatient surgeries annually. Kaiser and Sentara were among the hospital systems that achieved straight-A grades on Leapfrog's recently released national report — 100% of Kaiser and Sentara hospitals received the highest grade the group gives.

"Preventing HAIs takes the form of performance-improvement projects focused on all the different types of infection, and in all the different settings and for all patients," says Barnes. "Infection prevention and control departments work to lead and train physicians, nurses, administrators, and other staff in the prevention of infections and how to control the infrequent occurrence of outbreaks of infectious disease. We also team up with employee health professionals to follow up on communicable disease exposures, to ensure proper testing and treatment as needed.

"We in prevention and control departments also spend a lot of time making sure that best practices are shared throughout the facility, the region, and the organization so that patients benefit throughout our organization," Barnes continues. "Equally important is that we share the bad stuff — the opportunity areas — so that we can improve care and prevent errors from recurring."

A toolkit developed by Kaiser's national infection prevention department is posted on the web (<http://bit.ly/infect-kit>) for easy access by any health care professional interested in infection control.

Other health plans may want to follow insurers that are revising how they pay for care. Michael S. Sherman, MD, senior vice president and chief medical officer at Harvard Pilgrim Health Care (HPHC), explains that under some payment models, the federal Centers for Medicare & Medicaid Services (CMS) and health plans say they will not pay for treatment of avoidable complications such as HAIs. "But that also leads to lots of negotiation about what is avoidable and what isn't," he says. "Fixed-revenue models such as global payments address that issue."



Hospitals go where the money is, says Michael S. Sherman, MD, senior vice president and CMO at Harvard Pilgrim Health Care. The insurer rewards hospitals with low HAI rates through its pay-for-performance program.

It's unlikely that any hospital would seek to boost revenue by intentionally infecting patients, Sherman adds. "But I would say that hospitals, like other businesses, go where the money is, and if reducing readmissions, infections and complications threatens to hurt them financially, then switching to a system of fixed payments for episodes of care can be a win-win-win for health plans, patients, and purchasers."

Although HPHC does not intentionally pay for such complications, it still expects hospitals to reduce HAIs, Sherman adds. "We have not gathered enough data to demonstrate this type of reduction explicitly."

The company rewards low rates of HAIs by including them as process and outcomes measures in its pay-for-performance program and by including them among the key measures that determine which hospitals qualify for the HPHC honor roll. Among the outcome measures that HPHC collects on hospitals are the number of CLABSIs, catheter-associated urinary tract infections (CAUTIs), and SSIs from colon surgery.

Seeking to minimize infection risk, the Harvard Pilgrim Health Care Institute participated in a study published in May on a protocol designed to cut bloodstream infections. Researchers showed that when hospitals use antimicrobial soap and ointment on all intensive-care patients, they can make a big difference. In the study of

75,000 patients in 43 community hospitals in 16 states, daily bathing of ICU patients with chlorhexidine soap and applying mupirocin ointment in nasal passages for five days cut bloodstream infections caused by MRSA and other pathogens by 44%. This was simpler than screening all ICU patients for the bacteria, the researchers said in a report on the study in the New England Journal of Medicine (<http://bit.ly/decolon-ize>).

For hospitals and health plans, the study showed the value of making the bathing protocol part of routine care for ICU patients, says Richard Platt, MD, the study's senior investigator and a professor and chairman of the HPHC Institute.

For Santa, this study and other research suggest that hospitals must introduce protocols and follow them. "Strategies for limiting the spread of HAIs have been shown to decrease them dramatically," he says. "It's possible to introduce protocols for all infections whether they are SSIs, CLABSIs, MRSA infections, or cases of *Clostridium difficile*," he says.

"Peter Pronovost, MD, of Johns Hopkins Medicine and others have made the checklist approach popular, and that's important. We just need to introduce these strategies and follow them."

When that is done, he says, the straggler hospitals will enter the mainstream — and do less inadvertent harm to patients.

How hospitals profit from their own mistakes

Last May, researchers at the Johns Hopkins Armstrong Institute for Patient Safety and Quality showed that hospitals benefit financially when patients' hospital stays are complicated by preventable bloodstream infections.

The researchers also reported that insurers rather than hospitals would reap the most savings by supporting programs to prevent hospital-acquired infections (HAIs). The study was published online in the American Journal of Medical Quality (<http://bit.ly/well-good>).

"Hospitals should be financially rewarded for preventing harm rather than for treating the resulting illness," says study leader Eugene Hsu, MD, an anesthesiology resident at Johns Hopkins. "Instead, hospitals have a perverse financial incentive to keep patients longer and provide more interventions."

The cost to care for any ICU patient who develops an avoidable central-line-associated bloodstream infection (CLABSI) is nearly three times what it would be for a similar patient without such an infection, the researchers found.

These patients spend an average of 23 extra days in the hospital, and hospitals receive eight times as much margin per patient, they reported. Yet Hsu asserts that most physicians and hospitals are not driven by the potential financial gains, but rather by a desire to deliver the best quality care possible for patients.

"We have known that hospitals often profit from complications, even ones of their own making," says Peter J. Pronovost, MD, PhD, senior vice president for patient safety at Johns Hopkins Medicine and one of the authors of the research. "What we did not know was by how much, and that private insurers are largely footing the bill."

Private insurers pay more for outliers than government insurers do, even when the triggering event is preventable, says Peter Pronovost, MD, PhD, senior VP for patient safety for Johns Hopkins Medicine.

For the study, researchers reviewed hospital records at Queens Medical Center in Honolulu. The hospital participated in the state-wide Comprehensive Unit Based Safety (CUSP) program to reduce central line infections from 2009 through 2011. The program determined costs, payment, and profit margin for 16 HAI patients and compared them with 64 ICU patients who did not have line infections. For treating an infected patient, the hospital's average margin per patient was \$54,906, but for treating a similar but uninfected patient, the hospital lost \$6,506.

For 10 government-insured ICU patients with CLABSIs, the mean payment to the hospital was \$154,832, and for 39 ICU patients who did not have a CLABSI, the mean payment was \$58,327, for a difference of \$96,594. The figure did not achieve statistical significance.

For five commercially insured ICU patients who had a CLABSI, the mean hospital payment was \$495,000, and for 23 ICU patients who did not have a CLABSI, it was \$100,000, a difference of \$395,000.

The diagnosis-related group (DRG) payment system that most health insurers use to pay hospitals provides a perverse incentive by paying more for more complicated care, Pronovost explains.

DRGs pay by the episode, which should provide an incentive for hospitals to keep costs low, but hospitals can receive more for complex care under provisions for outliers. With outlier payments, a hospital is paid a percentage of charges, meaning the more it charges, the more it receives, Pronovost adds. Most of the CLABSIs in the study were considered outliers and thus generated a large payout.

And for outliers, private insurers pay more than government insurers, even when the triggering event is preventable, adds Pronovost.

Pronovost, the author of *Safe Patients, Smart Hospitals: How One Doctor's Checklist Can Help Us Change Health Care from the Inside Out*, suggests that insurers could realize significant returns by investing the money used to pay for just one preventable infection in quality-improvement programs.

When hospitals in Michigan and Rhode Island adopted a checklist and other interventions that Pronovost developed and tested at Johns Hopkins Hospital in Baltimore, they nearly eliminated catheter infections.

— Joseph Burns

To cut HAIs, hospital system will use antimicrobial copper

Sentara Healthcare in Norfolk, Va., will be among the first hospitals in the United States to use antimicrobial copper surfaces on countertops, over-the-bed tables, and bed rails when it opens a 129-bed patient tower at Sentara Leigh Hospital.

Early this year, Sentara will add antimicrobial copper textiles, ranging from bed linens to patient gowns, throughout the building, Sentara announced in November.

The 11-hospital health system will study the effects of using copper surfaces and textiles to determine whether they decrease rates of hospital-acquired infections.

In April, a study published in the *Journal of Infection Control and Hospital Epidemiology* reported that using antimicrobial copper surfaces in hospital rooms can reduce HAIs by 58%.

Patients in ICU rooms with copper alloy surfaces had a significantly lower rate of incident HAIs than those patients who had standard rooms, the researchers reported.

Funded by the Department of Defense, the study was done at Medical University of South Carolina, Memorial Sloan-Kettering Cancer Center in New York, and the Ralph H. Johnson Veterans Affairs Medical Center in Charleston, S.C. Researchers evaluated 650 patients and 16 rooms (half of them standard rooms, and half with copper-alloy surfaces) between July 2010 and June 2011.

The study is significant because the use of copper as an antimicrobial is outside of the normal way of thinking about infection control, says Archelle Georgiou, MD, a health care consultant.

“Antimicrobial copper is not normally used in health care, but perhaps a disruptive innovation like this is what’s needed to begin to control hospital-acquired infections,” she says.

— Joseph Burns

How the Leapfrog Group grades hospitals

The Leapfrog Group Hospital Safety Score function (www.hospitalsafetyscore.org) assigns general hospitals a grade of A to F for how safe they are for patients. The upshot is that many hospitals still aren't doing enough to prevent hospital-acquired infections.

For this year's survey, Leapfrog added measures on catheter-associated urinary tract infections (CAUTIs) and surgical-site infections: colon (SSI: Colon). While CAUTIs and SSI: Colon have not received as much public attention as other measures, they are among the most common hospital infections and take a combined 18,000 lives each year. With data from the Center for Medicare & Medicaid Services "Hospital Compare" web site and the Leapfrog Hospital Survey, Leapfrog now has the publicly available data needed to include these critical measures in the score.

— Joseph Burns

Inappropriate antibiotic use in ED contributes to HAI problem

For children, rate of inappropriate use has fallen

Reviews of the misuse of antibiotics generally focus on inpatient or outpatient settings and ignore emergency departments, say the authors of one of the first studies that tracks the problem in EDs.

About 126 million people were treated in EDs for acute respiratory tract infections (ARTIs) from 2001 to 2010 and 61% of these were treated with antibiotics, says the study "Antibiotic Utilization for Acute Respiratory Tract Infections in U.S. Emergency Departments" in the journal *Antimicrobial Agents and Chemotherapy*.

"This is likely multifactorial and may result from lack of insurance, lack of primary care access, or patient preference to seek care in the ED setting," say the authors. "Our results support the hypothesis that many U.S. EDs are functioning as 'safety-net' care centers, with the majority of ARTI patients being uninsured or insured by Medicaid."

The authors' list of antibiotics includes penicillins, cephalosporins, macrolides, sulfonamides and lincomycin derivatives, quinolones, carbapenems, aminoglycosides, glycolylines, glycopeptides, and leprostatics.

The rates of antibiotic utilization in the ED when the drugs weren't needed decreased overall from 621 (in 2001–2002) to 577 (in 2009–2010) per 1,000 ED visits. For patients 5 and younger, they decreased from 261 per 1,000 visits to 203. Patients ages 5 to 19 saw the greatest decrease: 444 to 275.

Unnecessary antibiotic use for patients ages 20 to 64 remained about stable: 535 per 1,000 visits in 2001–2002 and 500 in 2009–2010. Rates rose about 10% for people 65 and older, from 595 per 1,000 visits in 2001–2002 to 666 in 2009–2010.

"The observed lack of change in antibiotic utilization for adult ARTI patients, especially those ARTIs for which antibiotics are not indicated, is concerning," the study states.

Antimicrobial stewardship programs (ASPs) have met with success, the authors note, but have focused mainly on inpatients. The ED, says the report, "has unique challenges that may not be amenable to standard ASPs. For example, emergency physicians may not be willing to stop and consult antimicrobial guidelines, given the high-volume, high-acuity nature of the ED. Doctor-patient relationships in the ED are episodic, and thus ED patients may be less willing to accept emergency physician advice on antibiotic use."

Appropriate antibiotic use in the ED might "involve a combination of patient education, rapid diagnostic testing, ED-specific guidelines and treatment pathways, antibiotic order forms, or postprescription reviews."

— Frank Diamond

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