HAIs and SSIs: National Initiatives Aim to Control These Killers

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The move toward mandatory reporting of healthcare-acquired infections (HAIs) is just one way that transparency of healthcare delivery and increased accountability on the part of healthcare providers is being achieved. A number of initiatives have been developed during the past few years that are pushing for greater empowerment of healthcare workers (HCWs) and patients to prevent HAIs, and for a much greater degree of intolerance of life-threatening infections and adverse events in the nation's 6,000-plus hospitals.

Surgical site infections (SSIs) account for as much as 16 percent of all HAIs, and among surgical patients, SSIs account for approximately 40 percent of HAIs. And according to researchers,[1] surgical patients who develop SSIs are twice as likely to die as other surgical patients. Recognizing the significant morbidity and mortality associated with SSIs, in 1999 the Centers for Disease Control and Prevention (CDC) issued comprehensive guidelines,[2] and several years later, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) included reducing the risk of HAIs (including SSIs) in its 2005 National Patient Safety Goals. Galvanizing momentum and advancing evidence-based practice have been a handful of organizations that recognize it's time to translate theory into practice.

100,000 Lives Campaign

Preventing surgical site infections (SSIs) and deaths from SSIs by reliably implementing ideal perioperative care for all surgical patients is one of the goals of the 100,000 Lives Campaign, an initiative of the non-profit Institute for Healthcare Improvement (IHI) which is disseminating expert information and powerful improvement tools throughout the healthcare system. This campaign has enlisted 3,000-plus hospitals across the country in a commitment to implement changes in care that have been proven to prevent avoidable deaths. The campaign is rooted in six interventions:

- Deploy rapid response teams at the first sign of patient decline
- Deliver reliable, evidence-based care for acute myocardial infarction to prevent deaths from heart attack
- Prevent adverse drug events by implementing medication reconciliation

- Prevent central line infections by implementing a series of interdependent, scientifically grounded steps called the "Central Line Bundle"
- Prevent surgical site infections by reliably delivering the correct perioperative care
- Prevent ventilator-associated pneumonia by implementing a series of interdependent, scientifically grounded steps called the "Ventilator Bundle"

Central to the interventions are bundles which bring together scientifically grounded concepts that are both necessary and sufficient to improve the clinical outcome of interest. The focus of measurement is the completion of the entire bundle as a single intervention, rather than completion of its individual components.

"(The bundles) are a real change in the way we approach infections," says Don Goldmann, MD, senior vice president of the IHI, a member of the infectious diseases clinical staff at Children's Hospital Boston, and professor of immunology and infectious diseases at Harvard School of Public Health. "In the past we have had a fair amount of evidence on what works, but we really didn't have a coordinated, rigorous approach to implementing that evidence-based practice. The infection control community was trying to advocate for infection control practices, but overall, there hasn't been that much of a sense of urgency to prevent infections on the part of the healthcare stakeholders who cared for patients. That has changed."

Goldmann continues, "The concept of bundles makes it an all-or-nothing healthcare proposition, and it simplifies care. Clinical guidelines are notoriously long and convoluted, containing many levels of evidence, and it doesn't exactly give you a simple view of the imperatives contained therein. The bundles, however, select specific, evidence-based aspects of care and they say to the healthcare provider, 'we are going to get this bundle 100 percent right.' That is much easier to put into practice."

Goldmann explains that because the bundles are short, concise, and direct pieces of guidance, corresponding compliance rates should be 100 percent because anything less is unacceptable.

"It's like saying if we perform one aspect of hand hygiene well and we get 90 percent compliance, then we have done well. But your average patient doesn't care if you got 1 out of 4 measures or 2 out of 4 measures right, they want their healthcare providers to get all of the measures right the first time; there is no partial credit from the patient's point of view. Once people understand the bundles concept, I have found remarkably little resistance to it in the end. They may look at it and say, 'this is impossible' or 'this is very difficult,' but they certainly find it easier to deal with than a long clinical guideline, and they do understand the patient's point of view that it is all or nothing and getting it partially right is not OK. Where it all works is in the attention to getting everything right, the multi-disciplinary approach, and daily vigilance as to how healthcare can be improved. There is much less tolerance of infections, complications, and adverse events now."

The 100,000 Lives Campaign emphasizes that ideal perioperative care can prevent SSIs, and that care incorporates appropriate use of antibiotics, appropriate hair removal (avoidance of razors)[2], perioperative glucose control[3-4], and perioperative normothermia.[5]

"Any time you make an incision in the body, you create a pathway for germs," says David Classen, MD, vice president of the Health Delivery Services division of First Consulting Group in Long Beach, Calif. "It's inevitable, so our job is to push down the infection rate as far as possible and keep pushing."

Another goal of the 100,000 Lives Campaign is preventing central venous catheter-related bloodstream infection (CRBSI). Consider these facts:[6-8] 48 percent of ICU patients have central venous catheters, accounting for about 15 million central venous catheter days per year in ICUs; there are approximately 5.3 CR-BSIs per 1,000 catheter-days in ICUs.; the attributable mortality for CR-BSIs is approximately 18 percent, so there are probably about 14,000 deaths annually due to CR-BSIs in ICUs. CR-BSIs are addressed in CDC guidelines,[9] the Institute of Medicine,[10] and by JCAHO in its 2005 National Patient Safety Goals.

The "central line bundle" promulgated by the IHI is comprised of hand hygiene, maximal barrier precautions, chlorhexidine skin antisepsis, optimal catheter site selection, and daily review of line necessity with prompt removal of unnecessary lines. One study11 has shown that ICUs that have implemented multifaceted interventions similar to the central line bundle have nearly eliminated CR-BSIs.

Partners in Your Care Program

Empowerment is at the core of the Partners in Your Care program, a patient, family, and HCW program for monitoring hand hygiene compliance that was developed by Maryanne McGuckin, PhD, of the University of Pennsylvania. Patients and families are requested to be partners in healthcare by asking all HCWs that have direct contact with their family member patient, "Did you wash/sanitize your hands?" In addition, the patient is visited by a health educator within 24 hours of admission to discuss the importance of hand hygiene by HCWs in preventing HAIs, and receives a brochure discussing the hand-hygiene imperative.

The Partners in Your Care program provides the infection control practitioner (ICP) with an ongoing technique for hand hygiene, education, compliance with hand hygiene, and outcome monitoring through soap and hand-sanitizer usage. Following a simple formula, an ICP collects data on soap and handsanitizer usage and forwards it to the University of Pennsylvania to analyze. A confidential report showing handwashings per bed day, infection rates and/or endemic organism trend is sent monthly to monitor the program's success.

Traditional educational hand-hygiene programs comprise in-services, behavioral modification/ intervention, and observational components. Experts say that while these methods trigger initial success and improvement, they are short-lived. Where Partners in Your Care differs is the focus on the patient, not the HCW, in that the patient becomes the intervention that changes HCW behavior. McGuckin says that the program has been evaluated in the U.S. and Europe, showing a 35 percent to 60 percent increase in hand-hygiene compliance, and is the first behavioral program to show sustained compliance.[12] McGuckin, who served on the 2002 CDC task force that developed hand hygiene guidelines for HCWs, created Partners in Your Care to help fight HAIs. The program, which combines monitoring and patient empowerment, is used in more than 300 hospitals and has shown a mean improvement in hand hygiene compliance of 59 percent.

McGuckin also points to a recent survey that proves patients will take matters into their own hands, literally. Results from this University of Pennsylvania survey show "if armed with the right information, patients are willing to become a part of the solution," McGuckin says. "Once we tell them that we welcome their reminders, patients will become active members of their healthcare team by asking their HCWs to wash their hands." The survey also signaled that patient empowerment plays an

increasingly important role in the HAI issue, with 4 in 5 consumers saying they would ask hospital staff to wash their hands, if prompted to do so.

"I think our survey has answered the question once and for all, about healthcare consumers' willingness to be part of the hand-hygiene team," McGuckin says. "I think the survey should put clinicians' minds at ease that it is all right to tell your patients to remind HCWs to sanitize their hands. HCWs say, 'We don't want to tell patients to remind us to wash our hands because they will think we have a problem at our hospital.' Consumers/patients don't feel that way. ICPs should say to their hospitals, 'Look, we should encourage patient empowerment because they are saying it's OK to do so.' The literature points to the fact that HCWs forget to wash their hands; if you tell the patient it's OK to ask, they will do it, and it will have a tremendous impact on HAIs."

McGuckin continues, "Study after study shows that no mater what you do in terms of education, hand-hygiene compliance is short term and relatively unsustainable. Current programs have about a 20 percent compliance rate. We must change the culture by involving the patient because the patient is the only constant among many variables in the healthcare equation. In the eight years of the program's existence, we have a great deal of data showing sustained hand hygiene compliance in the hospitals involved in the program. We now have more than 400 hospitals supplying data, so we can tell what people are doing out there, and the bottom line is once they involve the patient, they get to almost 100 percent handhygiene compliance." McGuckin emphasizes that healthcare consumers in general are more observant of handhygiene practices, especially in a new age of mandatory reporting of HAIs in some states.

"In the survey we asked consumers, the last time you were in the hospital, did you notice people putting on gloves instead of washing their hands, and 52 percent said yes. The important message we should be giving hospitals is, guess what, our patients are noticing this. They will realize that gloves do not replace handwashing. The foundation of preventing HAIs is hand hygiene."

Committee to Reduce Infection Deaths

The Committee to Reduce Infection Deaths (RID) is a nonprofit educational organization dedicated to providing hospital administrators, caregivers, insurers, and patients with the information they need to stop HAIs. Through RID's recent report, "Unnecessary Deaths: The Human and Financial Costs of Hospital Infections," Betsy McCaughey, PhD, a health policy expert and chairman of RID, is calling upon the CDC and public health officials to do more to stop HAI-related deaths. The report, co-sponsored by the National Center for Policy Analysis, alerts the public to the grave financial and human consequences of poor infection control in U.S. hospitals and demonstrates that these infections are almost all preventable through improvements in hospital procedures and hygiene.

RID's goals are to:

- Save lives.
- Reduce soaring healthcare costs triggered by HAIs (a 2002 Harvard study shows that a post-operative wound infection more than doubles a patient's cost of care, and urinary tract infections increase patient care costs by 35 percent to 47 percent).
- Deliver a clear, united, powerful message to hospitals that protecting patients from infection should be a higher priority.

- Invite hospitals to work with RID, knowing that consumers will favor hospitals who make reducing or eliminating HAIs a priority.
- Share best practices from experts that reduce and eliminate HAIs.
- Provide patients the information they need to help protect themselves, including demanding that hospital staff sanitize their hands and practice good hygiene.
- Encourage hospitals to provide infection report cards.

"One out of every 20 patients gets an infection in the hospital," says McCaughey. "Infections that have been nearly eradicated in some countries, such as methicillin-resistant *Staphylococcus aureus* (MRSA), are raging through hospitals. In the U.S., the danger is growing worse. Increasingly, hospital infections cannot be cured with commonly used antibiotics. These infections are almost all preventable. 'Unnecessary Deaths' documents the success of U.S. hospitals that have reduced infections by 85 percent or more in pilot programs."

McCaughey says standard precautions, as promulgated by the CDC, are inadequate, a stance long taken by infectious disease experts such as Barry Farr, MD, MSc, and others who advocate the use of contact precautions and active surveillance. "The CDC has delayed calling on all hospitals to institute the rigorous precautions that are working in other countries and in the few U.S. hospitals that have tried them. Standard precautions are far less effective in preventing HAIs." In 2003, the Society for Healthcare Epidemiologists of America (SHEA) warned that although hospitals have infection control programs, "there is little evidence of control in most facilities."

Several years ago, SHEA issued important guidelines for preventing nosocomial transmission of multidrug-resistant strains of *Staphylococcus aureus* and *Enterococcus*, essentially advocating for active surveillance cultures to identify the reservoir for spread of pathogens; engaging in rigorous hand hygiene practices; using barrier precautions for patients known or suspected to be colonized or infected with resistant organisms; engaging in goods antibiotic stewardship to curb resistance; and other measures, including proper environmental cleaning, and co-horting of equipment among colonized or infected patients.[13]

"There are at least 50 studies demonstrating the effectiveness of these precautions," says Carlene Muto, MD, an epidemiologist at the University of Pittsburgh Medical Center, "and not one study suggesting it's possible to control MRSA without them."

One study shows that MRSA spreads from patient to patient 15 times as fast under standard precautions, as advocated by the CDC, as under the more rigorous precautions advocated by SHEA.[14]

McCaughey emphasizes, "We want patients to know there is a great deal they can do to protect themselves from infection before they go into the hospital; one important part of the RID report is the list of steps patients can take to protect themselves. The list is based on solid, peer-reviewed literature that is so seldom shared with patients. Another major thrust of the report is that the CDC should be doing more to encourage hospitals to put into place the more rigorous precautions that are proven successful in stopping the transmission of bacteria from patient to patient."

McCaughey continues, "If you stand in an ER and watch the doctors and nurses scrub and pull on their gloves, they have done what the CDC says is necessary, but it is not enough to prevent infections because those same clinicians reach up and open privacy curtains, which are laden with bacteria, and the gloves are contaminated before they ever touch the patient.

So hand hygiene is not enough. We need more effective training of HCWs about better precautions, because for the past 40 years, ever since the liberal use of antibiotics replaced attention to hygiene, young HCWs in training have not been taught to avoid contaminating their hands or gloves once they scrub. They have not been taught to avoid leaning over a contaminated bedside and then carrying that bacteria on their lab coats and scrubs to the next bedside. They haven't been taught to clean their stethoscopes before putting them on a patient. They aren't being taught about contact precautions."

McCaughey adds, "We need evolved thought and leadership, and that is why I put part of the blame on the CDC. As long as they continue to advocate only for standard precautions, hospitals administrators will use that as an excuse not to implement more rigorous precautions."

Mandatory Reporting Initiatives

In late January, the Association for Professionals in Infection Control and Epidemiology (APIC), the Infectious Diseases Society of America (IDSA), and SHEA released model legislation to assist patient safety initiatives by giving state legislatures a template to use when adopting legislation for the collection and reporting of HAI rates.

"Our organizations recognize the challenges to the states of public reporting," says Michael L. Tapper, MD, chair of SHEA's Public Policy and Governmental Affairs Committee. "Sound science and appropriate methodologies are integral to states' successful institution of reporting requirements."

"Currently, there is no uniform national standard for surveillance of HAIs or standardized systems for collecting and reporting these infections when they occur," says APIC president Kathleen Arias, MS, MT, SM, CIC. "For the first time, states are armed with a tool to help craft legislation that will result in useful data by which facilities can benchmark their performance."

The new model legislation was developed in response to a growing trend. At least six states now have laws mandating public reporting of infection rates, and one state mandates reporting infection rates to the state government. Similar proposals have been introduced in about 20 other states.

"States need a good model on which to base their systems," says IDSA president Martin J. Blaser, MD. "It's important that public reporting be done in a way that allows people to discern what the data actually mean, and how the data can be used to prevent infections and improve patient care."

The model legislation aims to ensure that state reporting systems adhere to recommended practices that have been shown to reduce the risk of HAIs, protect the confidentiality of medical records, and reflect the fact that some institutions treat more seriously ill patients.

"People should be able to use this information to measure how well institutions perform. The model legislation makes certain that state reporting systems are based on reliable data," says SHEA president Trish M. Perl, MD, MSc.

The aforementioned University of Pennsylvania study supports the idea that access to hospital infection-rate data will impact patients' choices. According to the survey, 93 percent of consumers say knowing infection rates for a hospital or doctor would influence their selections, while 87 percent say higher-than-average infection rates would be a very important reason to avoid a hospital.

McGuckin says that mandatory reporting signals a return to the basic tenets of infection control. “I have been in infection control for 30 years and we did surveillance back then. I think we have gotten away from it; all of a sudden ICPs were saying, ‘I don’t have time for surveillance, I have to do prevention.’ The further away you get from surveillance, the less you want to return to it, but it’s essential. I think we’re getting back to basics now, and surveillance is what infection control is all about. If you don’t know where your problems are, you can’t correct them. It’s more fun to educate and give lectures than it is to do surveillance, but I am glad to see that mandatory reporting is bringing us back to this critical tool.”

Bringing it All Together

Goldmann believes that initiatives such as the 100,000 Lives Campaign work because they are voluntary, non-punitive approaches to empowerment of the patient and the healthcare provider.

“Patients are serving as sentinels in the night, reminding people to do what they are supposed to be doing; this has made care more patient-centered,” he says. “And HCWs are becoming more accountable. When you mobilize people to achieve a lofty aim, raise the bar on performance, and challenging the U.S. healthcare system to do even better, it’s amazing what can happen. A lot of healthcare stakeholders, who would really like to effect change, are encumbered by their own bureaucracy; something like the 100,000 Lives Campaign steps up the pace and allows them to change some of the old, lethargic processes they may have had; the galvanizing of energy is important to the campaign’s success.”

Goldmann says that building on momentum is key. “We always talk about ideas and execution; good ideas can’t get started if there is no will to make progress, and if you don’t execute, you don’t make improvements. I think we need to pay more attention to behavioral issues; people don’t feel a sense of urgency if they are not enabled and if they feel there is no impetus for change. So getting into people’s heads is one thing, but then you must pay attention to performance barriers; if people don’t feel they can make a difference, they will probably not perform.” Goldmann continues, “It’s a bold leap.

Nobody said when we started this campaign that we knew how to help 3,000 hospitals improve, and so it’s gratifying to see a great number of hospitals able to make astonishing leaps in improvement. Like anything, success can be uneven, but the overall impact is great.”

- Institute for Healthcare Improvement’s 100,000 Lives Campaign: http://www.ihi.org/IHI/Programs/Campaign/
- Partners in Your Care program: http://www.med.upenn.edu/mcguckin/handwashing/
- Committee to Reduce Infection Death (RID)’s “Unnecessary Deaths” report: http://www.hospitalinfection.org/ridbooklet.pdf
- Model mandatory reporting legislation: http://www.shea-online.org/Assets/files/Model_Legislation_-_APIC__IDSA__SHEA.pdf
- Surgical Care Improvement Project (SCIP): www.medqic.org/scip

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