SUPPLEMENT ARTICLE: INTRODUCTION

Improving Patient Safety Through Infection Control: A New Healthcare Imperative

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Many healthcare organizations, professional associations, government and accrediting agencies, legislators, regulators, payers, and consumer advocacy groups have advanced the prevention of healthcare-associated infections as a national imperative, stimulating the creation of "A Compendium of Strategies to Prevent Healthcare-Associated Infections in Acute Care Hospitals" in this supplement. In this introduction, we provide background and context and discuss the major issues that shaped the recommendations included in the compendium.

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INTRODUCTION AND BACKGROUND

The Centers for Disease Control and Prevention estimates that 5%-10% of hospitalized patients develop a healthcare-associated infection (HAI),[1] corresponding to approximately 2 million HAIs associated with nearly 100,000 deaths each year in US hospitals.[2] The risk of serious complications due to HAIs is particularly high for patients requiring intensive care.[3] A number of factors likely contribute to this problem, including increasing rates of antimicrobial resistance, the development of progressively more-complex medical procedures and invasive medical technology that place patients at risk for procedure- or device-related infections, and an increasingly elderly and immunocompromised patient population.

Hospital-based infection surveillance, prevention, and control programs have been in place for many decades to monitor the occurrence of HAIs and to control the spread of hospital-acquired infections through internal quality improvement efforts (Table 1). The publication of the Institute of Medicine report "To Err is Human: Building a Safer Health System" in 1999, however, focused the attention of the larger healthcare community, policy makers, and the public on opportunities for improving patient safety in healthcare facilities.[11] Although the report highlighted the need to prevent medication errors, many HAIs were acknowledged to fall within the category of preventable medical errors, galvanizing hospital-based, as well as more-widespread, HAI prevention efforts. The Institute of Medicine's 2003 report "Transforming Health Care Quality" included prevention of HAIs as one of the 20 "Priority Areas for National Action."[12] Recent incorporation of performance measures focused on HAI prevention into regulatory and financial reimbursement systems reflects the growing consensus that many HAIs are preventable and that payers should pay less, not more, when these infections occur (Table 2).[10,13-19]

STRATEGIES FOR THE PREVENTION OF HAIs

Recent reports have suggested that many HAIs can be prevented through implementation of evidence-based "best practices." A number of recent improvement efforts have involved simultaneous implementation of several practice improvements ("bundles"). Because studies that have evaluated the impact of these practices have typically focused on single interventions or bundling of multiple concurrent interventions, the effectiveness of and potential synergy between specific combinations of interventions are unknown. One example of an intervention bundle is the simultaneous implementation of several practices focused on central line–associated bloodstream infection (CLABSI) prevention, which has been associated with improvements in CLABSI rates in single- and multicenter studies.[20-22] Pronovost et al.[21] demonstrated, in a large-scale study involving 103 intensive care units in Michigan, that an intervention bundle focused on hand hygiene, use of full barrier precautions, cleaning of skin with chlorhexidine, avoiding insertion of lines into the femoral vein, and prompt removal of unnecessary intravascular catheters resulted in a large and sustained reduction in CLABSI rates.

Other best practices have been identified for prevention of surgical site infection (SSI). Many studies have demonstrated that optimizing administration of perioperative antimicrobial prophylaxis reduces the risk for SSI after a variety of surgical procedures. SSI prevention practices aimed at optimizing the choice of antimicrobial agent, timing of administration, and duration of prophylaxis, as well as other perioperative prac-

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TABLE 1. National Healthcare-Associated Infection (HAI) Surveillance Initiatives

Year	Event	Comment
1970	The CDC establishes the NNIS [4]	Hospitals voluntarily contribute surveillance data for internal monitoring and benchmarking
1975	Hospital-based infection control programs established	By 1974, more than half of US hospitals had organized surveillance programs with infection control nurses [5]
1976	JCAHO established [6]	Detailed surveillance system requirements are incorporated into JCAHO standards for accreditation
1985	The CDC publishes the results of the SENIC Project [7]	Results suggest that the combination of ongoing surveillance, active control efforts, and qualified staff could prevent up to one-third of HAIs
2003	Illinois is the first state to enact mandatory reporting of HAIs [8]	Hospitals are required to report process and outcome measures for central line–associated bloodstream infections, surgical site infections, and ventilator-associated pneumonia
2005	NNIS restructured into the NHSN [9]	National open enrollment for hospitals and outpatient dialysis centers in 2007
2005	Deficit Reduction Act of 2005 passed [10]	The CMS requires hospitals to submit data on 10 quality measures, including antimicrobial prophylaxis process measures

NOTE. CDC, Centers for Disease Control and Prevention; CMS, Centers for Medicare and Medicaid Services; JCAHO, Joint Commission for Accreditation of Healthcare Organizations; NHSN, National Healthcare Safety Network; NNIS, National Nosocomial Infections Surveillance; SENIC, Study on the Efficacy of Nosocomial Infection Control.

tices, such as maintaining glucose control and avoidance of shaving of the operative site, have been advocated by the Centers for Medicare and Medicaid Services, the Joint Commission, and the Institute for Healthcare Improvement.[15,18] The Centers for Medicare and Medicaid Services has linked reporting of adherence to recommended perioperative antimicrobial prophylaxis process measures by individual hospitals to reimbursement.[10] In 2006, the Institute for Healthcare Improvement attracted widespread participation in their "100,000 Lives" campaign to encourage hospitals throughout the United States to implement best-practices bundles aimed at preventing complications of hospitalization, including prevention of CLABSI, SSI, and ventilator-associated pneumonia (VAP). The Institute for Healthcare Improvement has recently expanded this effort in their "5 Million Lives" campaign and has incorporated promotion of practices aimed at preventing healthcare-associated transmission of methicillin-resistant *Staphylococcus aureus*.[18]

It is important to acknowledge that some practices that are included in widely used prevention bundles, such as maintenance of semirecumbent position for patients undergoing mechanical ventilation, as a component of the Institute for Healthcare Improvement VAP prevention bundle, are inconsistently linked to improvement of outcomes in the medical literature.[23,24] A systematic review of the evidence to support practices relevant to improving patient safety, published by the Stanford-UCSF Evidence-based Practice Center in 2001, included evaluation of a number of infection control practices, including those aimed at prevention of catheter-associated urinary tract infection (CAUTI), intravascular catheter-associated infection, VAP, and SSI.[25] In the opinion of that review, practices such as the use of maximum sterile barriers while placing central lines, appropriate antimicrobial prophylaxis for surgical patients, continuous aspiration of subglottic secretions, and use of antimicrobial-impregnated central venous catheters were assessed to have the strongest evidence base. The authors noted that further research is needed to fill substantial gaps in the scientific basis for many infection control practice recommendations.

A number of guidelines are available that provide recommendations for prevention of specific types of HAIs.[26-33] Most of these include an assessment of the strength of evidence for each recommendation. These guidelines were created by multidisciplinary groups with expertise in healthcare epidemiology, including but not limited to the Healthcare Infection Control Practices Advisory Committee and the Centers for Disease Control and Prevention; professional societies, such as the Society for Healthcare Epidemiology of America, the Association for Professionals in Infection Control and Epidemiology, the American Thoracic Society, and the Infectious Diseases Society of America; as well as other not-for-profit groups focused on quality improvement, such as the Institute for Healthcare Improvement. Although these guidelines provide valuable evidence-based guidance regarding HAI detection and prevention, 2 major limitations are the frequent absence of recommendations regarding performance measures that can be used to

TABLE 2. National Healthcare-Associated Infection Prevention Initiatives

Organization or initiative	Area of focus
Institute of Medicine	One of 20 "priority areas for transforming health care" [12] • Prevention of healthcare-associated infections
Centers for Medicare and Medicaid Services	One of 4 conditions targeted by the Hospital Quality Initiative [13] • Surgical infection prevention
The Joint Commission	One of 8 National Patient Safety Goals for hospitals in 2007 [14] • Goal 7: Reduce the risk of healthcare-associated infections 7A: Comply with current CDC hand-hygiene guidelines
National Hospital Quality Measures (Joint Commission and Centers for Medicare and Medicaid Services)	One of 5 National Hospital Quality Measure sets [15] • Surgical Care Improvement Project
CDC	Guidelines for protecting patients [16] • Hand hygiene in healthcare settings • Prevention of intravascular device–related infections • Prevention of surgical site infections • Management of multidrug-resistant organisms in healthcare settings
National Quality Forum	Five of the 30 safe practices endorsed by the National Quality Forum [17] • 1. Create and sustain a healthcare culture of safety • 19. Action should be taken to prevent ventilator-associated pneumonia by implementing ventilator bundle intervention practices • 20. Adhere to effective methods of preventing central venous catheter–associated bloodstream infections, and specify the requirements in explicit policies and procedures • 21. Prevent surgical site infections by implementing 4 components of care: a. Appropriate use of antibiotics b. Appropriate hair removal c. Maintenance of postoperative glucose control for patients undergoing major cardiac surgery d. Establishment of postoperative normothermia for patients undergoing colorectal surgery • 22. Comply with current CDC hand-hygiene guidelines.
Institute for Healthcare Improvement	Four of 12 interventions in the 5 Million Lives Campaign [18] • Prevent central line infections • Prevent surgical site infections • Prevent ventilator-associated pneumonia • Reduce methicillin-resistant *Staphylococcus aureus* infection
Deficit Reduction Act of 2005	Centers for Medicare and Medicaid Services [10] • Requires hospitals to report specific data, including some healthcare-associated infection prevention performance measures, to receive their full Medicare reimbursement • Will withhold higher payments for selected conditions, including some healthcare-associated infections, if not present at admission

NOTE. Table adapted from the Institute for Healthcare Improvement's Alignment with National Health Care Improvement Initiatives (available at: http://www.ihi.org/IHI/Programs/Campaign/Campaign.htm?TabId=2), with permission from the Institute for Healthcare Improvement. CDC, Centers for Disease Control and Prevention.

assess the effectiveness of implemented interventions and the lack of integration of resource requirements and feasibility into these recommendations.

Few resources are available that provide clear guidance regarding effective ways to implement best practices for HAI prevention. The Stanford-UCSF Evidence-based Practice Center recently assessed the published literature evaluating the effectiveness of quality improvement strategies in promoting adherence to interventions for prevention of SSI, CLABSI, VAP, and CAUTI.[34] Because the evidence for the strategies evaluated was generally of suboptimal quality, they were unable to make any firm recommendations regarding quality-improvement interventions, but they did note that preliminary data indicated that several strategies were worthy of future study. These included reminders for improving adherence to perioperative antimicrobial prophylaxis timing

and duration and use of automatic stop orders to reduce unnecessary urethral catheterization.

PERFORMANCE MEASURES FOR INTERNAL QUALITY IMPROVEMENT AND EXTERNAL REPORTING

Monitoring of performance is critical for assessing the effectiveness of quality improvement interventions. Performance can be evaluated through outcome measures (eg, SSI rates) or process measures that are closely associated with patient outcomes (eg, optimal timing of perioperative antimicrobial prophylaxis administration).[35] The relevance of process measures depends on choosing processes that, when adhered to, improve healthcare outcomes. A Society for Healthcare Epidemiology of America position paper published in 1995 described the criteria for selection of quality indicators. These include identifying indicator events that are clearly defined, with numerators and denominators; using indicator variables that are easy to identify and collect; selecting data collection methods that are sensitive enough to capture the data and that can be standardized across all institutions; selecting indicator events that occur frequently enough to provide an adequate sample size; and comparing populations with similar intrinsic risks or providing appropriate risk adjustments.[35]

Advantages of process measures include the clear goal of a 100% rate of adherence to the recommended practice and the fact that process measures do not require adjustment for patients' underlying risk of infection or severity of disease.[36] A number of organizations, such as the Hospital Quality Alliance, the Joint Commission, and the LeapFrog Group, have collected data through voluntary reporting of HAI process measures (eg, rates of adherence to the recommended choice of perioperative antimicrobial prophylaxis agent, timing of administration, and duration of prophylaxis) as a means for hospitals to monitor their internal quality improvement efforts by benchmarking their adherence to recommended best practices against other hospitals. Data collected by the Hospital Quality Alliance on the performance of more than 4,000 acute care hospitals assessed by means of these voluntarily submitted process measures are also accessible to the public.[37]

Surveillance of HAI outcomes has typically focused on device- and procedure-associated infections because these infections occur relatively frequently among hospitalized patients and because these infections are associated with potentially modifiable risk factors (eg, prompt removal of central lines that are no longer required for care of the patient). The most widely used definitions are those of the National Healthcare Safety Network at the Centers for Disease Control and Prevention. Some outcome measures that are appropriate for internal monitoring within a healthcare institution may be inappropriate for comparisons among multiple institutions.[38] HAI definitions, for example, can be variably interpreted and applied even when standardized National Healthcare Safety Network definitions are used.[39-41] Variability in methods and available data sources used for surveillance can greatly impact the completeness of HAI ascertainment. There is growing evidence that HAI surveillance methods that use readily accessible automated data (eg, claims, microbiology, or pharmacy data) for screening can provide a more resource-efficient approach; however, these information technology applications cannot replace the need for frontline surveillance by trained personnel.[40,42,43] In addition, risk adjustment to account for underlying differences between healthcare facilities' patient populations is essential for meaningful comparisons, but little is known at present about how to optimally adjust for the risk of developing HAIs.[35,36] Several methods, such as the All Patient Refined Diagnosis Related Groups (APR-DRG) and Acute Physiology and Chronic Health Evaluation (APACHE) score, have been used to adjust for mortality risk, but there are currently no well-validated aggregate severity-of-illness scoring systems for infectious disease outcomes.

RECENT RECOMMENDATIONS FOR PUBLIC REPORTING OF OUTCOME MEASURES

Public reporting of outcome measures has been advocated as an incentive for healthcare facilities to improve care and as a means to enable consumers to choose safer care. Consumer groups, such as the Consumers Union and the Committee to Reduce Infection Deaths, have strongly advocated for public reporting of HAI rates. Partly in response to increasing demand from consumer groups, many states have legislated or are in the process of legislating mandatory public reporting of some HAI outcome measures. The reporting requirements proposed by each state have varied.[44] In some countries, mandatory public reporting of HAIs is already in place. For example, in the United Kingdom, mandatory healthcare organization–based surveillance and public reporting of methicillin-resistant *Staphylococcus aureus* bloodstream infections have been in place since 2001.[45]

Despite this movement toward universal mandatory reporting of HAI rates, little is known about the effectiveness of public reporting for improving healthcare performance. A recent systematic review of the literature performed by the Healthcare Infection Control Practices Advisory Committee[46] found the evidence for effectiveness of public reporting systems in improving healthcare performance to be inconclusive.

Many challenges exist in providing useful information to consumers and other stakeholders and in preventing unintended consequences of public reporting.[47] The Healthcare Infection Control Practices Advisory Committee published consensus recommendations for public reporting of HAIs in 2005, highlighting the importance of the thoughtful selection of the appropriate measures of healthcare performance and patient populations to monitor; the use of standardized case-finding methods and data validity checks; adequate support for infrastructure, resources, and infection control staff; the use of appropriate adjustments to control for differences in

TABLE 3. *Performance Measures Recommended by the National Quality Forum (NQF) for Public Reporting*

Infection type, NQF endorsement	Recommended performance measure
Intravascular catheter–associated bloodstream infection	
Previously endorsed[a,b]	CLABSI rate
HAI-01	CLABSI process measures • Hand hygiene • Maximal barrier precautions upon insertion • Chlorhexidine skin antisepsis • Optimal catheter site selection, with subclavian vein as the preferred site for nontunneled catheters in patients aged 18 years and older • Daily review of line necessity with prompt removal of unnecessary lines
SSI	
HAI-02	SSI rate[c]
Previously endorsed[a,d]	SSI process measures • Prophylactic antibiotic received within 1 hour before surgical incision • Prophylactic antibiotic selection for surgical patients • Prophylactic antibiotic discontinued within 24 hours after surgery end time (48 hours for coronary artery bypass graft or other cardiac surgery)
HAI-03	SSI process measure: patients undergoing cardiac surgery who have controlled 6:00 AM postoperative serum glucose level
HAI-04	SSI process measure: surgical patients who undergo appropriate hair removal
VAP and respiratory illness	
Previously endorsed[b]	VAP rate for patients in intensive care units[e]
HAI-05	VAP process measures • Head of the bed elevation $\geqslant 30°$ (unless medically contraindicated) • Daily "sedation interruption" and daily assessment of readiness to extubate • Peptic ulcer disease prophylaxis • Deep venous thrombosis prophylaxis
HAI-06	Number of healthcare personnel who receive influenza vaccination
CAUTI	
Previously endorsed[b]	CAUTI rate among patients in intensive care units[e]
HAI in pediatric populations	
HAI-7A	Rates of late sepsis or meningitis in neonates
HAI-7B	Rates of late sepsis or meningitis in neonates with very low birth weight

NOTE. CAUTI, catheter-associated urinary tract infection; CLABSI, central line–associated bloodstream infection; HAI, healthcare-associated infection; SSI, surgical site infection; VAP, ventilator-associated pneumonia.

[a] National Quality Forum Hospital Care (2003) project.[50]

[b] Nursing-Sensitive Care (2004) project.[51]

[c] Public reporting of this measure is recommended to be limited to deep incisional and organ/space infections occurring as a result of elective procedures in the following categories: coronary artery bypass graft surgery and other cardiac surgery, hip or knee arthroplasty, colon surgery, hysterectomy (abdominal or vaginal), and vascular surgery.

[d] Cardiac Surgery (2004) project.[52]

[e] The National Quality Forum has requested an update of the measure to comport with current science and to improve the likelihood of comparable implementation across hospitals and other healthcare entities.

underlying infection risks; and production of useful and accessible reports for stakeholders, with feedback given to healthcare providers.[36] They also recommended choosing process and outcome measures appropriate to the facility type and gradually phasing in these measures to allow time for facilities to adapt and to permit ongoing evaluation of data validity. Several process measures were recommended, including adherence to recommended central line insertion practices, surgical antimicrobial prophylaxis, and influenza vaccination coverage for healthcare personnel and patients. The two outcome measures noted to be appropriate for some hospitals were rates of CLABSI and rates of SSI after selected operations. The Healthcare Infection Control Practices Advisory Committee document also discussed the possibility of using computerized information, when available, for data collection, limiting reporting to well-defined and readily iden-

tifiable events and using simpler and more-objective event definitions, with the goal of decreasing the burden of data collection and improving the consistency of reporting among facilities. The Healthcare-Associated Infection Working Group of the Joint Public Policy Committee recently provided a tool kit to assist states and healthcare facilities facing mandates to publicly report HAIs. Their recommendations for public reporting of outcome measures mirrored the previous Healthcare Infection Control Practices Advisory Committee recommendations and included CLABSIs in intensive care units and SSIs for selected procedures performed with adequate frequency to permit meaningful comparisons between hospitals.[48]

In response to the increasing focus on public reporting of HAIs, the National Quality Forum recently made available recommendations for public reporting of HAIs[49-52] and has identified 8 newly recommended HAI-related performance measures (Table 3). These recommendations target well-defined and objectively assessed outcome measures for public reporting by, for example, including only deep and organ/space SSIs as SSI outcome measures. Importantly, the National Quality Forum noted the critical need for further research to evaluate optimal methods for monitoring of HAIs and HAI prevention strategies for VAP and CAUTI, as well as for HAIs associated with multidrug-resistant organisms.

Pay for performance is another strategy that has been used by payers to strengthen the business case for quality improvement. More than 160 different private and public pay-for-performance programs are currently in place in the United States.[53] Most of these programs reward a mixture of quality, service, and/or efficiency measures of care. A series of recent reports from the Institute of Medicine outline the possible future roadmap of pay for performance and suggest that pay-for-performance programs may help to standardize both the measures used in these programs and the approach to rewarding improved performance.[54] The potential impact of this approach, however, remains unclear, because several recent studies of pay-for-performance programs in combination with public reporting have resulted in only modest improvements in quality, and little is currently known about the impact of these strategies on HAI outcomes or overall patient safety.[55] Given the risks to patient safety and the economic burden associated with HAIs, the Centers for Medicare and Medicaid Services has implemented a strategy to limit reimbursement for complications of specific HAIs, including CAUTIs, vascular catheter–associated infections, and mediastinitis after coronary artery bypass graft surgery, in an effort to motivate improvement. This alteration in reimbursement will provide additional financial incentive for healthcare facilities to prevent infectious complications.[19]

THE BUSINESS CASE FOR HAI PREVENTION

HAIs impose a major societal and financial burden. Although demonstrating value to hospital administrators to justify expansion of infection control programs is essential, HAIs are a significant risk to patient safety, and there is no inherent reason that infection control interventions must save society money.[56] Nonetheless, the safest care is often the most cost-effective care. Policy decisions on a local and national level to financially support investments in infection control or hospital reimbursements to support infection control, however, require supporting economic analyses.

Current approaches to creating a compelling business case to justify resources required by infection control programs for prevention of HAIs are outlined in a recent Society for Healthcare Epidemiology of America report.[56] Cost savings obtained by avoiding infections can be estimated using attributable costs of HAIs available from the medical literature[57] (Table 4) or from hospital-specific data. A business case for infection control can also be based on fixed costs rather than cost savings,[56] since the greatest opportunity for improving hospital profits through HAI prevention comes from reducing excess length of stay. Because patients who do not develop infections are discharged sooner, potential gains in revenue can be projected by estimating the additional bed days available through infection prevention efforts.

An obstacle to building a compelling business case for HAI prevention programs is that current reimbursement approaches often reward organizations for treating HAIs, by increasing payment for these infections as they do for other complications. Prevention of HAIs currently accrues benefit to the payer and not to the hospital. For example, in one state in 2004, 76% of all reported hospital infections were billed to Medicare and Medicaid, leading to almost $1.4 billion in charges.[58]

Unfortunately, estimates of the economic impact of interventions to reduce HAIs required for optimal decision making by infection control experts and hospital administrators are

TABLE 4. Attributable Costs of Healthcare-Associated Infections

Infection type	Attributable cost, mean (range), 2005 US$	Excess LOS, mean (range), days
Ventilator-associated pneumonia	22,875 (9,986-54,503)	9.6 (7.4-11.5)
Catheter-associated bloodstream infection	18,432 (3,592-34,410)	12 (4.5-19.6)
CABG-associated surgical site infection	17,944 (7,874-26,668)	25.7 (20-35)
Catheter-associated urinary tract infection	1,257 (804-1,710)	...

NOTE. Adapted from Perencevich et al.[56] CABG, coronary artery bypass graft; LOS, length of hospital stay.

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limited in their availability.[59] High-quality cost-effectiveness analyses are clearly needed. Numerous regulatory requirements for infection control infrastructure at the healthcare delivery and organizational level are currently in place and are likely to expand, given the current public focus, complicating research efforts to effectively evaluate the true cost-effectiveness of infection control programs.

INFRASTRUCTURE AND RESOURCE NEEDS FOR SURVEILLANCE, PREVENTION, CONTROL, AND REPORTING OF HAIs

Responding to increased demands for adherence to best practices and collecting process and outcome measurements for internal and external reporting is resource intensive. The collection of HAI and risk factor data required for mandatory reporting can result in diversion of resources away from prevention efforts. In addition, resources required for these efforts can compete with other functions of infection control professionals that are critical for patient safety.[60]

Implementing and maintaining even the most basic HAI detection and prevention efforts requires a trained and adequately staffed hospital-based infection control program with appropriate expert supervision, capacity that may be unavailable in many smaller community hospitals. In addition, many interventions require access to additional resources, such as information technology support. Reporting systems require infrastructure, including manuals; training; processes for data collection, entry, and analysis; and appropriate quality checks. Because risk adjustment requires collection of some information about the entire population being monitored (eg, for SSI surveillance, American Society of Anesthesiologists score, wound class, and procedure duration for all patients undergoing the targeted surgical procedure), access to automated information is required to sustain surveillance and reporting efforts in most hospitals. The implementation of some interventions, such as computerized reminders for removal of urinary catheters or timely administration and discontinuation of surgical antimicrobial prophylaxis, requires access to fairly advanced information technology. Implementing and maintaining prevention programs also requires adequate personnel, supplies, and clinical laboratory support, all of which necessitate allocation of adequate financial resources.

CONCLUSIONS

Despite the best of intentions of healthcare providers, HAIs occur in US hospitals every day and result in serious illness and deaths. The compendium of strategies to prevent HAIs included in this supplement to *Infection Control and Hospital Epidemiology* was created to provide a concise, evidence-based resource containing practical recommendations for acute care hospitals. We believe that uniform implementation of these basic infection surveillance, control, and prevention recommendations in all acute care hospitals in the United States will lead to improvements in hospitals' infection rates and patient safety programs.

Atul Gawande writes in the introduction to his book, *Better: A Surgeon's Notes on Performance,* "In medicine, as in any profession, we must grapple with systems, resources, circumstances, people—and our own shortcomings, as well. We face obstacles of seemingly endless variety. Yet somehow we must advance, we must refine, we must improve."[61(p8)] The implementation of best practices to prevent HAI presents a number of challenges that can be overcome only by collaboration between the healthcare community, payers, purchasers, and patients. Adequate resources must be dedicated to local infection control programs and more widespread public health integration, as well as much-needed research to guide future HAI prevention efforts. Daunting as these challenges may be, protecting our patients from preventable infections is undeniably the responsibility of all hospitals and healthcare providers.

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