

# Preventing Health Care–Associated Infections: Connecting North Carolina’s Patients to National Efforts

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With increased federal and state attention to prevention and control of health care–associated infections (HAIs), broad multifacility collaboratives have emerged to guide providers’ work at the bedside. This commentary reviews how HAI prevention flows from federal-level guidance through state leadership and into hospitals, connecting governance to its impact on North Carolina’s patients.

The landscape of health care–associated infection (HAI) prevention and control in the United States has changed dramatically over the past 2 decades. What was once viewed as a problem for individual hospitals has finally been acknowledged as the broader public health issue it truly is, affecting all locations where health care is delivered and requiring the oversight and collaboration of both public and private entities. The Centers for Disease Control and Prevention (CDC) estimates that 4% of all hospital admissions result in an HAI, yielding approximately 721,800 infections [1] and 99,000 deaths each year [2], as well as \$28–\$33 billion in excess costs [3]. In North Carolina, HAIs result in direct costs to facilities in the range of approximately \$124–\$348 million annually [4]. These numbers likely underestimate the true burden of HAIs because they include only a subset of HAIs occurring in acute care hospitals and only those that have been reported.

## HAI Surveillance and Public Health Engagement

As with any public health issue, one of the first challenges in trying to address HAIs is accurately measuring the problem. Efforts to secure reliable and comparable HAI data have both led to and been shaped by expanding reporting requirements from the Centers for Medicare & Medicaid Services (CMS) and the rapid expansion of the National Healthcare Safety Network (NHSN), a secure, Internet-based HAI tracking system managed by the CDC. Under this umbrella, medical and public health communities across the nation came together to decide how to conduct surveillance, how to monitor progress both within and across facilities, and how to decide where limited resources should be invested.

The acknowledgement that HAIs are a shared problem and the increased availability of HAI data have fostered an increasingly collaborative approach to quality improvement efforts. Collaboration has been embraced at the national

level, notably with the 2009 release by the US Department of Health and Human Services (HHS) of the *National Action Plan to Prevent Health Care–Associated Infections: Road Map to Elimination*, which was last updated in 2013 [5]. This national action plan was soon followed by the rollout of Partnership for Patients, a public-private partnership aimed at improving patient safety and reducing costs [6]. These federal initiatives outlined specific goals and targets for selected HAIs and other preventable hospital-acquired harms (eg, pressure ulcers, falls, and readmissions), suggested strategies to reduce these and other threats to patient safety, and provided opportunities for disparate entities to collaborate and share best practices in the interest of patients. HHS estimates that these efforts prevented 50,000 deaths and 1.3 million adverse events between 2010 and mid-2015, translating into more than \$12 billion in avoided costs [7].

## North Carolina State-Level Surveillance

As federal oversight and engagement in HAI surveillance and prevention have evolved, both public and private entities have simultaneously worked on HAI prevention in North Carolina. Progress towards establishing a statewide HAI surveillance system received a major boost in 2008 when the North Carolina General Assembly convened the Joint Study Committee on Hospital Infection Control and Disclosure. This committee ultimately recommended that North Carolina implement a mandatory, statewide surveillance and reporting system. This became a reality on June 27, 2011, when Governor Perdue signed into law a bill requiring all acute care hospitals to report specified HAIs to the North Carolina Department of Health and Human Services through the NHSN [8].

In the 5 years since reporting of HAIs became mandatory in North Carolina, the list of conditions under public health surveillance has continued to expand to keep pace with emerging evidence and to maintain alignment with various federal reporting programs (eg, the CMS Value-Based Purchasing and Hospital-Acquired Condition Reduction

Electronically published September 9, 2016.

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**N C Med J.** 2016;**77(5):334-336.** ©2016 by the North Carolina Institute of Medicine and The Duke Endowment. All rights reserved. 0029-2559/2016/77508

Programs). Currently, reporting is required for each of the following infections: central line-associated bloodstream infections, catheter-associated urinary tract infections (CAUTI), surgical site infections following colon surgeries or abdominal hysterectomies, laboratory-identified methicillin-resistant *Staphylococcus aureus* bloodstream infections, and laboratory-identified *Clostridium difficile* infections. Decisions about specific reporting requirements and processes are made in close consultation with the statewide HAI Advisory Group, which was convened in 2010 and which includes stakeholders from government, health care institutions, infection prevention organizations, health care quality organizations, and the public.

The list of facilities that are required to report HAI data to state entities or CMS has also expanded beyond acute care hospitals to now include inpatient rehabilitation facilities and long-term acute care hospitals. The North Carolina Department of Health and Human Services works with hospitals and other partners on the ongoing collection, analysis, and dissemination of these data, which are posted online quarterly [9]. These quarterly reports are meant to provide patients with consistent, valid, and comparable HAI information and to help hospitals monitor their own progress and allow for self-comparisons to similar hospitals across the state.

### Translating Goals Into Action

Across North Carolina, hospitals and health systems have partnered with state and national programs around HAI reduction initiatives to translate broad strategies, goals, and findings into action at patients' bedsides. Some of the partnerships formed in North Carolina are focused on HAI reduction within specific subpopulations. For instance, the Perinatal Quality Collaborative of North Carolina specifically targets perinatal and newborn care [10]. Other programs involve hospital-level or system-level teams working to reduce individual HAIs.

Mission Hospital's effort to eliminate CAUTIs is one example of a hospital-level reduction initiative. Mission's work began in earnest in April 2008 under the leadership of the Prevent UTI committee. Initially, the Prevent UTI committee comprised a multidisciplinary team including bedside nurses, physicians, clinical leaders, performance improvement engineers, infection prevention specialists, and informaticians. This team convened to assess the impact of CAUTIs across Mission Hospital through the combined lenses of quality, clinical best practice, and cost. The team's initial goal was to reduce internal markers of actual and potential CAUTIs hospital-wide by 40%.

Over 4 years, the Prevent UTI committee worked through a series of quality improvement Plan-Do-Study-Act cycles that spanned 3 major areas: equipment, protocol, and education. In terms of equipment, the team implemented changes in Foley catheter placement kits and securement devices. Second, the committee developed a nurse-driven

Foley removal protocol. Using these clinical guidelines, the bedside nurses assume management of Foley catheters with specific criteria to determine their continued necessity; this change also implemented a routine cadence for regular assessment beginning on insertion. Finally, the Prevent UTI committee recognized that changes in both equipment and protocol required significant and repeated education focusing on why the new protocol was developed (eg, etiology and epidemiology of CAUTI), the pathophysiology of CAUTI (emphasizing that the longer an indwelling catheter remains in place, the higher the risk), and how to use the new nurse-driven protocol.

As the aforementioned state and national efforts evolved between 2008 and 2012, the Prevent UTI program also incorporated new findings, including those from the HAI Advisory Group and the Partnership for Patients Hospital Engagement Network (HEN) initiatives. Through continued focus, the team achieved great success across several outcome domains. Clinically, there was a 40% reduction in markers of actual and potential CAUTI achieved by mid-2011, and the Foley utilization ratio dropped by over 30% by mid-2012. From a financial standpoint, Foley kit use in the emergency department was reduced by 63.4%, saving tens of thousands of dollars per year.

Building on this success, Mission Hospital's Prevent UTI committee transitioned its ongoing work into Mission's broader CAUTI team, which remains in existence today. It remains a multidisciplinary team jointly led by nursing leaders and infection prevention specialists, and it is responsible for individually reviewing all CAUTIs, identifying opportunities for improvement, and developing action plans through root cause analysis. The team continues to identify new practices based on updated evidence, new literature, and sustained participation in state and federal partnerships like the HEN initiative. CAUTI team members work with clinical and operational leaders across Mission Health to ensure that existing gains in both practice and outcomes remain in place and that findings are shared across the enterprise.

### Conclusion

Local, state, and federal efforts to eliminate HAIs have greatly matured over the past 20 years. As the web of public-private partnerships between hospitals and state or federal governments grows more interconnected and HAI reporting becomes increasingly transparent, achieving a goal of zero patients affected by preventable HAIs will soon become possible. Federal agencies will almost certainly continue refining how HAIs are defined and tracked over time, meaning that state-level support for HAI reporting and prevention will remain crucial for the foreseeable future. In North Carolina, we are fortunate to have a community of hospitals, health systems, and public agencies that remain jointly committed to eliminating the burden of HAIs through leadership and partnership. NCMJ

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### Acknowledgements

The authors would like to acknowledge Jennifer MacFarquhar and Jacie Volkman for their help in preparing this manuscript, as well as caregivers across North Carolina for their commitment to eliminating health care-associated infections.

Potential conflicts of interest. All authors have no relevant conflicts of interest.

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