CONNECTICUT DEPARTMENT OF
PUBLIC HEALTH

Keeping Connecticut Healthy

THE COMMITTEE ON HEALTHCARE ASSOCIATED INFECTIONS

TO

THE DEPARTMENT OF PUBLIC HEALTH

AN ACT CONCERNING HOSPITAL ACQUIRED INFECTIONS

…

APRIL 1, 2007

State of Connecticut
Department of Public Health
410 Capitol Avenue
P.O. Box 340308
Hartford, CT 06134-0308

EXECUTIVE SUMMARY

Healthcare-associated infections ("HAIs") are a major public health problem throughout the United States. In Public Act 06-142, *An Act Concerning Hospital Acquired Infections*, the Connecticut legislature established the Committee on Healthcare Associated Infections ("Committee") and charged it with advising the Department of Public Health (DPH) with respect to the development, implementation, operation, and monitoring of a mandatory reporting system for HAIs in Connecticut.

In carrying out its charge, the Committee was instructed to consider appropriate standardized outcome and process measures that are: (1) capable of being validated; (2) based upon nationally recognized and recommended standards, to the extent such standards exist; (3) based upon competent and reliable scientific evidence; (4) protective of practitioner information and information concerning individual patients; and (5) capable of being used and easily understood by consumers. The Committee also was instructed to recommend to DPH appropriate methods for increasing public awareness about effective measures to reduce the spread of infections in communities, hospitals, and other healthcare settings.

The Committee began meeting regularly on August 31, 2006, and in the last seven months has engaged in a deliberative and productive work process that included the Committee's: (1)review of national data concerning the magnitude of the HAI problem; (2)hearing directly from individuals who have been deeply affected by HAIs; (3) review of recommendations of national authorities and experts on HAI reporting and infection prevention; (4) consideration of activities already taking place in Connecticut related to HAI reporting and prevention; (5)examination of established national and state HAI reporting systems, with presentations from and discussions with individuals who have been extensively involved in developing those initiatives and systems; and (6)consideration of various educational initiatives to increase public awareness of HAIs and ways to reduce the incidence of them.

The attached Report details the Committee's activities, discussions and deliberations, as well as the Committee's recommendations to DPH, which are summarized as follows:

1. Connecticut should utilize the reporting system established by the National Healthcare Safety Network (NHSN) of the Centers for Disease Control and Prevention (CDC);

2. Connecticut should initially begin collecting data on the NHSN module that tracks data relative to central line-associated blood stream infections ("CLABSIs") in patients in intensive care units. After hospitals are collecting and reporting data on CLABSIs in a standardized manner, add additional modules to the system, as appropriate;

3. The Connecticut program should be designed to go beyond the collection and reporting of data. It is essential that the data collected be used to implement evidence-based prevention methods.

4. HAI-related education is a critical element to the success of a statewide HAI reporting and prevention system, and education initiatives should commence well in advance of public reporting of HAI information derived from the HAI reporting system recommended by this Committee;

5. The implementation and success of the recommended HAI reporting system and education initiatives require an immediate and ongoing state funding commitment; and

6. The Committee should continue to serve in an advisory capacity to assist in the development and implementation of the recommended reporting system and education initiatives.

7. Resources in the amount of $250,000 are necessary for the Department of Public Health to implement the enclosed recommendations. An additional $55,000 is necessary to implement the recommendations of the Education Subcommittee.

8. Additional resources are necessary for Connecticut's hospitals to implement the collection, reporting and prevention efforts detailed in this report.

I. INTRODUCTION

Public Act 06-142, An Act Concerning Hospital Acquired Infections, called for the Commissioner of Public Health to convene the Committee on Healthcare Associated Infections ("Committee") and to meet for the first time no later than September 1, 2006. Voting members of the Committee include representatives of the Connecticut Hospital Association; members from organizations representing health care consumers; hospital-based infectious disease specialists or epidemiologists with demonstrated knowledge and competence in infectious disease related issues; a representative of the Connecticut State Medical Society; a representative of a labor organization representing hospital based nurses; and public members. In addition to voting members, the Committee did seek information and gained knowledge from ex-officio non-voting members.

Public Act 06-142, requires that the Committee on Healthcare Associated Infections on or before April 1, 2007 shall:

(1) Advise the department with respect to the development, implementation, operation and monitoring of a mandatory reporting system for healthcare associated infections;

(2) Identify, evaluate and recommend to the department appropriate standardized measures, including aggregate and facility specific reporting measures for healthcare associated infections and processes designed to prevent healthcare associated infections in hospital settings and any other healthcare settings deemed appropriate by the committee. Each such recommended measure shall, to the extent applicable to the type of measure being considered, be (A) capable of being validated, (B) based upon nationally recognized and recommended standards, to the extent such standards exist, (C) based upon competent and reliable scientific evidence, (D) protective of practitioner information and information concerning individual patients, and (E) capable of being used and easily understood by consumers; and

(3) Identify, evaluate and recommend to the Department of Public Health appropriate methods for increasing public awareness about effective measures to reduce the spread of infections in communities and in hospital settings and any other healthcare settings deemed appropriate by the Committee.

II. GENERAL BACKGROUND

Healthcare –Associated Infections: General Overview

Healthcare-associated infections (HAIs) are a major public health problem throughout the United States. It has been estimated by the Centers for Disease Control and Prevention (CDC) that more than two million patients in acute care hospitals throughout the United States acquire infections that are directly related to their hospitalizations. Many, but not

all, are already debilitated or ill. Their vulnerability for infection is further increased by surgical procedures, invasive therapies and immuno-compromising medications that are used to treat their acute medical conditions. It has been estimated that these infections contribute to more than 90,000 deaths and a cost of more than four billion dollars annually in the Untied States.

Approximately 5% of patients hospitalized in U.S. hospitals acquire HAIs. The most common of these infections are urinary tract infections (UTIs) associated with the use of indwelling urethral catheters. Catheter-associated UTIs account for approximately 40% of all HAIs. Usually these infections are relatively benign; they are treated with antibiotics and removal of the indwelling catheter with relatively little increase in morbidity, length of stay, or costs of hospitalization.

Blood stream infections that occur as a consequence of intravenous catheters, however, are a major cause of morbidity and mortality in hospitalized patients. These infections account for approximately 15% of HAIs. They occur primarily in intensive care units and result in significant increases in lengths of stay and costs of hospitalization.

Surgical site infections (SSIs) account for 15% of all HAIs, although the exact frequency of these infections is difficult to gauge because between 50% and 80% of SSIs become apparent only after discharge from the hospital. Surgical site infections, or wound infections, raise the costs of hospitalization significantly, particularly if they occur after certain types of procedures, such as cardiac surgery when the infection may involve vital internal organs and bones, resulting in major increases in morbidity, mortality, and lengths of stay in the intensive care unit and/or hospital.

Hospital-acquired pneumonias account for approximately 15% of HAIs. The majority of these infections occur as a result of endotracheal intubation and mechanical ventilation which take place in medical and surgical intensive care units. These infections generally complicate the hospital courses of seriously ill patients and are associated with the greatest incidence of fatal outcomes of any of the HAIs.

HAIs are caused by a wide variety of pathogenic bacteria and fungi. The microbiologic causes of these infections include an ever more virulent spectrum of agents that are resistant to commonly prescribed antibiotics, so called multidrug-resistant organisms (MDRO). These include such pathogens as Methicillin-Resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant enterococci (VRE), multidrug-resistant gram negative bacilli (MDRGNB) and fungi. In addition, more virulent strains of *Clostridium difficile* may be transmitted within the hospital environment, which in turn can contribute to the morbidity and mortality of seriously ill patients who are more vulnerable to HAIs.

HAIs are in part a consequence of medical progress, and medical progress has enabled hospitals and other healthcare providers to save the lives of many patients who would have died just a few years ago. However, HAIs are not an inevitable consequence of medical progress or hospitalization, even for today's severely ill patients. Indeed, preventive strategies, safer devices and sophisticated infection prevention programs are now available

that can decrease the incidence of these infections in our hospitals. To decrease the incidence of HAIs, close attention must be paid to adherence to proper infection prevention practices, including hand hygiene, avoidance of unnecessary invasive procedures, and the judicious use of antibiotics.

The CDC's Klevens and colleagues estimate that in 2002 there were 1.7 million HAIs in US hospitals, with 98,987 associated deaths.[1] By site, the estimated infections and deaths were: Urinary tract: 561,667 infections and 13,088 deaths; Bloodstream: 248,678 infections and 30,665 deaths; Pneumonia: 250,205 infections and 35,967 deaths; Surgical sites: 290,485 infections and 8,205 deaths; all other sites: 386,090 infections and 11,062 deaths.

In recent years, federal agencies, various state legislatures and agencies, hospitals and other healthcare providers, public health organizations, and consumer and patient representatives have explored the development of reporting systems for monitoring the incidence of HAIs, with the goal of helping consumers to make informed choices about their healthcare and improving the quality of healthcare by reducing the incidence of HAIs.

Public Reporting of Healthcare Associated Infections - Recommendations in the Literature

The Committee reviewed statements from recognized national authorities about the reporting of healthcare associated infections: The CDC's Healthcare Infection Control Practices Advisory Committee (HICPAC), the Association for Professionals in Infection Control and Epidemiology (APIC), and the Healthcare-Associated Infection Working Group of the Joint Public Policy Committee, representing the CDC, APIC, Society for Healthcare Epidemiology of America (SHEA), and Council of State and Territorial Epidemiologists (CSTE).[2] Common recommendations include:

- Ensuring the use of established public health surveillance methods (including standardized case-finding methods and data validity checks).
- Ensuring the selection of outcome measures based on the frequency, severity, and preventability of the outcomes and the likelihood that they can be detected and reported accurately.
- Ensuring the selection of appropriate patient populations to monitor.

[1] Public Health Reports, March-April 2007.

[2] The CDC's Healthcare Infection Control Practices Advisory Committee recommendations (Am J Infect Control 2005;33:217-26); the Association for Professionals in Infection Control and Epidemiology (APIC) position statement on mandatory public reporting of healthcare acquired infection (HAI) (http://www.apicmn.org/APIC%20Guidance%20for%20ICP's%20working%20with%20legislators.doc); Essentials of Public Reporting of Healthcare-Associated Infections: a Tool Kit. Prepared by the Healthcare-associated Infection Working Group of the Joint Public Policy Committee. www.cdc.gov/ncidod/dhqp. See the appendix here. See also Weinstein RA, Siegel JD, Brennan PJ. Infection-control report cards—securing patient safety (NEJM 2005;353;3:225-7.).

- Focusing on central line associated bloodstream infection (CLABSI) occurring in intensive care units (ICUs) and Surgical Site Infections (SSIs), following selected operations, as the best initial measures for public reporting.

- Involving knowledgeable persons in planning and data collection stages.

- Ensuring the consistent use of standardized infection definitions and standardized data collection protocols.

- Ensuring the implementation of adequate controls to assure patient confidentiality.

- Ensuring the inclusion of appropriate statistical adjustment for differences in underlying patient risk.

- Facilitating the phasing in of reporting requirements.

- Ensuring the provision of adequate support and resources to implement the reporting program.

- Ensuring the establishment of a feedback mechanism for healthcare providers to receive performance data so that quality improvement interventions may be adopted or adjusted accordingly.

- Ensuring the production of useful and meaningful reports to consumers.

CDC Reporting Systems: NNDSS, NNIS, and NHSN

The CDC and Council of State and Territorial Epidemiologists (CSTE) operate the National Notifiable Diseases Surveillance System (NNDSS). Some diseases reported through this system are likely HAIs; however, diseases are publicly reported at the state level only, and HAIs are not separated from other occurrences.

The CDC collected information from more than 300 hospitals throughout the United States via the National Nosocomial Infection Surveillance (NNIS) System. This was the only national reporting system, and it has been demonstrated to reduce infection.[3] Instructions from the CDC are provided to non-NNIS hospitals to calculate their own infection rates and compare them with published NNIS rates. The NNIS, initially based on the old DOS operating system and more recently on Windows, has transitioned to the National Healthcare Safety Network (NHSN) which incorporates NNIS, Dialysis Surveillance Network and the National Surveillance System for Healthcare Workers (NaSH). The CDC plans to invite all hospitals to join the NHSN and has changed the criteria for enrollment in

[3] Leape, NEJM 2002; 347;20:1633-8.

order to broaden participation. NHSN is currently giving priority for enrollment to states who have elected to use NHSN for mandatory reporting. The NHSN rollout between January and June 2007 for implementing mandatory reporting includes several states (NY, VT, SC, CO and TN). The NHSN is designed to be a Web-based reporting system for hospitals reporting HAIs into the system. The NHSN combines facility-level clinical performance measurement with national-level public health surveillance. Participating facilities use the NHSN application to enter, analyze, and share data. The CDC uses data collected through NHSN for aggregate analysis and risk-adjusted reporting and data analyses can be exported to a spreadsheet. The CDC is exploring the addition of a validation component to the system. The NHSN reporting tool is a secure, digital certificate, web-based system. Facilities must obtain their own hardware (computer, laser printer), have high-speed Internet access, and use the Windows XP or Windows 2000 operating system to submit data.

There are three patient safety component modules within the NHSN system: 1) device-associated, 2) procedure-associated, and 3) medication-associated. Within the device-associated module are central line-associated blood stream infection (CLABSI), ventilator-associated pneumonia (VAP), and catheter-associated urinary tract infection (CAUTI). There is also flexibility within these modules for states to customize data to be collected, including adding data elements. Currently, to participate in NHSN, facilities must submit data for at least one module for at least 6 months of a calendar year, use CDC definitions and codes for data collection, report events within 30 days of the end of the month, and pass quality control checks for completeness and accuracy. It is recommended that a trained Infection Control Professional (ICP) or hospital epidemiologist oversee the HAI surveillance program in each hospital, and other personnel may be trained to screen for events and, collect, enter, and analyze data. The NHSN offers training, collaboration with CSTE, and participation in a state users group.

The NHSN has confidentiality protections through the Public Health Service Act. A facility can share all or some of its data by conferring rights to data. This would allow for data sharing with DPH, in order to provide public reporting. Starting in 2007 there is an improved "confer rights to groups" feature and a flu vaccination module in NHSN version 1.2 (R. Monina Klevens, presentation to the Connecticut Committee on HAI, January 19, 2007).

Rates in the 2004 NNIS Report[4] are given by operative procedure, ICU and, for neonatal ICU, by infant birth weight. Although, a single hospital wide infection rate can be calculated, it is generally agreed upon such a rate is not meaningful. Hospital–wide infection rate reporting was dropped as a component of NNIS more than 10 years ago as it has not been demonstrated to be a cost-effective form of surveillance.

[4] AJIC 2004;32:470-85; also at http://www.cdc.gov/ncidod/dhqp/nnis_05delay.html.

Other National Efforts: CMS, The Joint Commission, IHI and AHRQ

In "Five Years After To Err is Human," Lucian Leape and Donald Berwick reviewed the national effort to make health care safe.[5] The authors called upon the Agency for Healthcare Research and Quality (AHRQ), The Joint Commission, the National Quality Forum (NQF), the American Medical Association (AMA), Leapfrog Group, and major payers, including the Centers for Medicare and Medicaid Services (CMS) to agree to a set of specific goals for patient safety, such as the list provided by the Commonwealth Fund and the Institute of Medicine. That list includes a 90% reduction in HAIs.

In August 2005, CMS enlarged its Surgical Care Improvement Project (http://www.medqic.org/scip/), a voluntary effort. The CMS Hospital Compare website (www.hospitalcompare.hhs.gov) began displaying two new quality of care measures in the category of Surgical Infection Prevention, which are reported on a voluntary basis. The measures are (1) Percent of Surgery Patients Who Receive Preventative Antibiotics Within One Hour of Incision, and (2) Percent of Surgery Patients Whose Preventative Antibiotics are Stopped within 24 Hours after Surgery. Qualidigm, the Connecticut Quality Improvement Organization (QIO), works with hospitals to prevent surgical infections. As of July 1, 2006 discharges, all Connecticut hospitals are reporting these measures. Connecticut hospitals continue to provide data to Hospital Compare about measures relating to heart attack, heart failure, and pneumonia care (the "core measures").

The Joint Commission 2004 Patient Safety Goal #7 for hospitals was "Reduce the risk of health care associated infections." Sub-goals were to comply with CDC hand hygiene guidelines and manage as a sentinel event all identified cases of unanticipated death or major permanent loss of function resulting from a health care associated infection.

The Institute for Healthcare Improvement's (IHI) "100,000 Lives Campaign" included components for preventing surgical site infections, central line infections, and ventilator-associated pneumonia. A list of participating hospitals can be downloaded from www.ihi.org. The list dated 10/28/2005 included 27 of the 30 acute care hospitals in Connecticut. The Institute for Healthcare Improvement posts success stories of hospitals that have reduced infection rates, including Baystate Medical Center in Springfield Massachusetts (IHI, 2004). Monthly results are shown for process of care measures. The "Five Million Lives Campaign" (December 2006-December 2008) includes the components of the earlier campaign, plus the following which relates to HAI: reduce Methicillin Resistant *Staphylococcus aureus* (MRSA) infection by implementing scientifically proven infection control practices.

The Keystone ICU Project, a partnership between Johns Hopkins University researchers and the Michigan Hospital Association, has reported results of its AHRQ-sponsored demonstration project.[6] 108 ICUs agreed to participate, while 34 did not; 103 reported data. Michigan's Blue Cross & Blue Shield provided $10 million in incentives. An

[5] JAMA 2005;293:2384-90, May 18.
[6] Pronovost et al, An intervention to decrease catheter-related bloodstream infections in the ICU. NEJM 2006;355:2725-32.

intervention resulted in 66% reduction in rates of catheter-associated bloodstream infection that was maintained throughout the 18-month study period. Many ICUs reported zero bloodstream infections or ventilator-associated pneumonias for six months or more (http://www.mha.org/mha/keystone/index.jsp).

Michigan plans to expand its program based on these results. The project goal of *Keystone: HAI*, which began in 2006, will be to eliminate hospital-associated infections in the hospital setting, starting with a strategic and manageable list of targeted infections. Only interventions that are consistent with national evidence for scientific merit and are feasible at the bedside will be used for this initiative. Initial evidence-based interventions to eliminate HAI will focus on appropriate hand hygiene, bloodstream infections and urinary tract infections.

Michigan's voluntary initiative highlights for the Committee the importance of collaboration and a balanced view regarding the utilization of process and outcome measures, characteristics which the Committee believes should be part of any new reporting system, whether voluntary or mandatory.

State Specific Efforts: Pennsylvania, Florida, Missouri, and New York

The Committee examined other states' efforts to implement mandatory HAI reporting systems. Below is a brief description of some of the initiatives taking place in other states, which the Committee considered in developing its recommendations.[7]

Pennsylvania

The Pennsylvania Healthcare Cost Containment Council (PHC4) administers the public reporting of infection rates in Pennsylvania. Although the system utilizes CDC NHSN definitions, the system does not utilize NHSN methodology. PHC4 has publicly reported rates, length-of-stay, mortality and cost data on four types of infections: SSI, CLABSI, Ventilator Associated Pneumonia (VAP) and Catheter Associated Urinary Tract Infections (CAUTI) using a minimal risk stratification methodology, which does not produce an appropriate basis for comparison among hospitals.

An important, incompletely controlled source of hospital variation in PA results from the use of different surveillance methods. Hospitals with electronic surveillance systems report higher HAI rates than hospitals that rely on manual systems. In the Pennsylvania Health Care Cost Containment Council report on HAI in Pennsylvania during 2005, the Reader's Guide advises that completeness of infection reporting across hospitals may vary, and that electronic surveillance may result in higher detection than standard methods.

[7] The Consumer's Union website called *Stop Hospital Infections* (www.stophospitalinfections.org) and the Association for Professionals in Infection Control and Epidemiology website (www.apic.org) list state efforts to require public reporting of nosocomial infections. Massachusetts will begin HAI reporting in July 2007, so its program is not yet established.

The director of PHC4 told the Committee that disparities in completeness of reporting were addressed through auditing of hospitals, after which reporting improved. More Infection Control Professionals (ICPs) were hired, but the reduction in HAI-related costs more than offset those staffing costs.

Similarly, an epidemiologist at one Pennsylvania hospital told the Committee that the PHC4 system requires hospitals to commit substantial resources to administer the program and properly screen infections originally identified by administrative billing data to verify that the infections were hospital acquired. In contrast to the PHC4 director, the hospital epidemiologist said that, in some instances, the new reporting effort diverted resources that were previously being utilized for infection prevention activities. He suggested that the system should have started smaller.

Florida

Florida passed legislation in 2004 mandating the creation of a hospital reporting website that included information on complications, errors and infections. A workgroup consisting of a diverse group of stakeholders reviewed various measures and chose the Agency for Healthcare Research and Quality's (AHRQ's) Patient Safety Indicators. These indicators are drawn from the administrative data collected by hospitals for billing purposes. Only 2 of the chosen measures apply to healthcare acquired infections. Hospitals are now also collecting and reporting the Joint Commission/Centers for Medicare and Medicaid Services (CMS) Surgical Infection Prevention measures. The Committee received information indicating that the system requires the Florida Department of Public Health to utilize substantial resources in terms of personnel to collect and process all of the measures.

While Florida's use of administrative data may decrease the data collection burden on the healthcare organizations, the infection percentage rates reported do not produce fair comparisons between hospitals, nor are they expected to. In fact, according to the Florida Compare Care website, the infection percentage rates reflect each hospital's unique population and should not be used to compare hospitals. The Joint Public Policy Committee discourages the use of administrative data alone to identify HAIs, in part due to the poor agreement between rates based on administrative and clinical data.[8]

Missouri

Missouri also utilized a committee process to develop its reporting system. The initial infections reported were Central Line-associated Bloodstream Infections (CLABSI) and three specific Surgical Site Infections (SSI). Missouri developed its own data collection software called the Missouri Healthcare-Associated Infection Reporting System (MHIRS) because the National Healthcare Safety Network (NHSN) system was not ready. The Committee was told that Missouri is now encouraging hospitals to use the NHSN system and the MHIRS system will be interfacing with NHSN in the future; that data collection is

[8] *Essentials of Public Reporting of Healthcare-Associated Infections: a Tool Kit*. See the appendix here.

problematic, especially for small hospitals, as they have to collect specific denominator data; and that most hospitals collect data manually and enter it into the system because there is no single commercial infection surveillance software system that interfaces with the MHIRS system. The Committee also received information indicating that the Missouri health department's original budget for the program was approximately $600,000 and that it anticipates a need for greater funding when the interface with NHSN occurs. [9]

One strength of MHIRS, a Web-based reporting system is that its easy for users to understand. The first data page makes use of three symbols (filled, half-filled, and empty circle) to indicate whether each ICU CLAB rate is significantly lower, the same, or higher than, respectively, the state, and the nation.

While some states (e.g. PA) discourage across hospital comparisons of HAI rates, the MHIRS encourages such comparisons. Differences in how states approach across hospital comparisons underscores the importance of exercising caution in interpretation. [10]

New York

The New York Department of Health (DoH) reporting system was developed using information gained and lessons learned from an infection reporting demonstration project done in the Albany and Syracuse areas. The NY system utilizes NHSN, and hospitals are starting with CLABSI in intensive care and SSI for coronary artery bypass graft (CABG) and colon surgeries. Hospitals began reporting as of January 1, 2007, but 2007 is considered a "pilot year" and data will be reported in aggregate only. Information reported to the Committee indicated that the DoH received approximately $560,000 for additional staff to function as regional liaisons to the hospitals, and that the department is seeking approximately $1.25 million for the next year in order to develop and implement quality

[9] The June 7, 2004 fiscal note (www.moga.mo.gov/Oversight/OVER04/fishtm/4608-07T.ORG.htm, available through the APIC website) estimated net effects on general revenue funds of $490,939 in FY 2005 (10 months), $536,824 in FY 2006, and $550,587 in FY 2007, not including unknown effects on local funds. The fiscal note was based on the assumption of 50,750 reported HAI among 725,000 Missouri patients annually (7%), 20 data elements per record for risk adjustment (1 million data items per year), increased staffing for data surveillance and education (1 health educator, 1 epidemiology specialist) and analysis (3 research analysts, 1 senior office support assistant), increased complaint investigations related to alleged infection control issues in regulated health care facilities (2,804 added hours, 2 FTE nurse consultants), and some publishing costs.

[10] Recently one Missouri hospital found itself caught as an example of these differing perspectives. Despite significant declines in infection rates in recent years, the MHIRS identifies Barnes-Jewish hospital (BJH), which has a high risk patient population, as having higher HAI rates than other Missouri hospitals for coronary, medical, and surgical ICU CLABSI. BJH is featured in an Association for Practitioners in Infection Control and Epidemiology (APIC) February 2007 white paper "Dispelling the Myths: the true cost of healthcare-associated infections" for decreasing infection rates and saving money between 2000 and 2004. A February 2007 web publication ahead of print ("Patient safety event reporting in critical care: a study of three intensive care units," Critical Care Medicine 35;4) also reports how BJH introduced a card-based event reporting system under which reporting increased significantly compared to pre-intervention web-based reporting.

and infection prevention projects to assist hospitals, as well as initiatives for public education prior to the scheduled release of hospital specific reports in 2009.

Connecticut Activities Related To HAI Reporting and Prevention

In the course of examining possible methods for mandatory HAI reporting in Connecticut, the Committee received an overview of the various federal and state statutes and regulations, as well as accreditation requirements, governing HAI reporting and prevention in Connecticut hospitals, including Medicare Conditions of Participation, Joint Commission accreditation standards, and state regulations administered by the Department of Public Health related to surveillance, prevention, and control of infections. In addition, Connecticut hospitals and their infectious disease and infection control staff have been working for many years to monitor and prevent infections, and many Connecticut hospitals also participate voluntarily in national quality programs that include infection reporting and prevention initiatives, such as the HHS Quality Initiative administered by CMS, and the Institute for Healthcare Improvement's "100,000 Lives Campaign." The Committee views the continued development and implementation of a mandatory reporting system in Connecticut as an opportunity for collaboration among all stakeholders to build upon the substantial efforts already underway to eliminate preventable HAIs with scientifically sound evidence-based process of care interventions.

III. COMMITTEE AND SUBCOMMITEE ACTIVITIES

The first meeting of the Committee on Healthcare Associated Infections was largely an organizational one that was held on August 31, 2006. The Connecticut Department of Public Health provided a general overview of the Public Act, the current Adverse Event law and a general overview of the reportable disease system that is used for acute infectious disease surveillance.

The Committee also made a commitment to have a brief portion of each meeting dedicated to hearing from consumers who have been or who have had family members impacted by healthcare associated infections.

At the October 27, 2006 meeting, members of the Committee involved in the legislative process, discussed the legislative intent of the Public Act. The Committee also heard presentations from Jean Rexford, who spoke about the "Interest and Concerns of the Consumer" and from Dr. Louise Dembry who presented "Healthcare Epidemiology: What is it?"

The Committee used its next two meetings (November 16, 2006 and December 15, 2006) to speak with representatives from hospitals and agencies in the states of Florida, Missouri, Pennsylvania and New York. This opportunity allowed Committee members to hear first hand the impact that new healthcare associated infections reporting can have on infection control, as well as its financial and resource impact on governmental bodies and hospitals.

At the meeting on January 19th, the Committee heard a presentation from the Centers for Disease Control and Prevention about its National Healthcare Safety Network (NHSN). After the presentation the Committee began its deliberations about what route Connecticut should take in the area of reporting healthcare associated infections. The Committee continued these discussions at its meeting on February 16th.

The focus of the February 23rd meeting was education. At this meeting a subcommittee on Education was formed to help formulate a timeline and plan for education of consumers. The full Committee will continue to discuss the issue of education as it pertains to elected officials, hospital leadership and staff and the media.

IV. RECOMMENDATIONS/ACTIONS TO BE TAKEN

The Committee agreed that the focus of discussions and recommendations should be on the prevention of HAIs. Thus, surveillance efforts should be carefully considered such as to not take time and resources away from ongoing or new prevention efforts.

The Committee makes the following recommendations in the areas of mandatory reporting, education and resources:

Mandatory Reporting System:

1. **Connecticut would be best served by using the NHSN system to track, report and prevent healthcare associated infections.**

   There are several important benefits to using the NHSN system. First, the system is being used by a number of states, making it possible not only to obtain standardized data for Connecticut hospitals, but also to benchmark Connecticut data with other states that participate in NHSN. Second, this recommendation eliminates the need to fund and design a data system unique to Connecticut for this purpose. CDC is the host for the NHSN system, so it is responsible for the updates and upgrades to the data system. Hospitals report data to the NHSN via a Web-based interface. The system resides at CDC. Under Connecticut's mandatory reporting requirement, DPH would be able to access hospital-specific data for Connecticut hospitals and conduct independent audits of the data. Third, the CDC system is modular. There are different infection monitoring modules that are currently usable and others that are in development. Further, the CDC has the time and willingness to work with Connecticut to address and adapt any given module to Connecticut's specific needs. One critical need would be for hospitals to be able to designate additional entities to receive and access the data, such as a patient safety organization or other entity assisting hospitals in quality initiatives. CDC has already done this with a number of other states. Finally, some Connecticut hospitals already participate in NHSN and have significant experience using the system.

2. **Connecticut should start with one module of the NHSN reporting system and then implement additional modules after hospitals are able to conduct surveillance and report in a standardized manner to NHSN.**

   The Committee believed that the best approach to implementing a reporting system was to begin in a manageable way and then expand the system as soon as practicable.

3. **Connecticut should start with the module that tracks data relative to central line-associated blood stream infections (CLABSIs) in ICU patients.**

   CLABSIs are one of the most serious and costly hospital-associated infections. There is strong scientific *evidence that many of these infections can be prevented* with the implementation and consistent use of evidence based processes of care. It is estimated that CLABSIs cost the healthcare system approximately $40,179 per case, and result in extended patient stays or death.[11] CLABSIs can be caused by a number of bacteria including MRSA (Methicillin-Resistant *Staphylococcus aureus*), an organism of concern to many. In addition, the Committee recommends further discussion with CDC to look at an infection prevention "process" measure, such as timely administration of antibiotics for the prevention of surgical site infections.

4. **The Connecticut program should be designed to go beyond the collection and reporting of data. It is essential that the data collected be used to implement evidence-based prevention methods.**

5. **The Committee should continue to meet and serve in an advisory capacity to develop time lines for adding new modules, to participate in more detailed discussions with CDC on the NHSN system and the potential to add Connecticut-specific process measures, as well as recommended evidence-based preventive measures.**

   It is the intent to add new modules after full and successful implementation of the CLABSI module, which could take up to a year. The Committee should also consider HAIs in institutions other than hospitals.

Education:

Education initiatives are a critical element to the success of the State HAI surveillance and Prevention Program. The foci of educational efforts should include hospital administrators, infection control practitioners, hospital staff, hospitalized patients, consumers (potential patients), the media, and State legislators.

The Committee's recommendation for the State of Connecticut involves four major programmatic components: 1) surveillance to establish baseline rates of specific hospital-acquired infections, 2) education of hospital leadership and staff regarding best practice

[11] American Journal of Medical Quality Supplement to volume 21, No 6, Nov/Dec 2006

methods to prevent infections, 3) follow-up surveillance to measure the impact of infection control efforts, and 4) feedback to hospitals, consumers, media and legislators regarding the impact of our preventive strategies.

Educational efforts should include training programs for hospital staff that support a culture that emphasizes the integration of best practices to prevent infections into the culture of every hospital in the State. Educational efforts should also encompass awareness programs for patients and consumers and updates of program findings and outcomes for the media and legislators.

The Committee makes the following **recommendations** in the area of education:

1. **Efforts to educate various constituencies should begin well in advance of public reporting.**

   Important constituencies to educate are:

   - consumers (including patients and families),
   - hospital staff (all levels including administration),
   - the Media,
   - legislators

2. **Education should include the following subject matter:**

   - evidence-based best practices for reducing various HAI and transmission of organisms/infections in general; and
   - what are HAIs; and
   - the rationale for choosing CLABSIs as the first focus area;
   - the types and definitions of data that will be publicly reported; and
   - the plan to implement other collection and reporting measures.

   The education content should utilize relevant portions of the current work of the Best Practices Subcommittee of DPH's Quality in Healthcare Advisory Committee. That subcommittee is working on a public messaging campaign promoting hand-washing.

3. **A variety of mechanisms for education should be used including public service announcements, hospital-wide campaigns for staff and patients using buttons or stickers that say "Wash Your Hands," websites and links, radio shows, and other media outlets.**

   The Committee formed an Education Subcommittee to identify and recommend mechanisms specifically for consumer education. The Education Subcommittee is presently considering recommendations for monthly educational programs, beginning

with a program on hand washing in October during International Infection Prevention Week and continuing with monthly programs for the ensuing year. Potential topics include "hand hygiene," "hand hygiene and surgical site infections," and "hand hygiene and the healthcare worker." These educational activities should be initiated in conjunction with the Best Practices Subcommittee of the Department of Public Health Quality in Healthcare Advisory Committee's patient safety literacy project that is also focusing on hand hygiene.

4. **Funding for these educational efforts will be necessary to implement a state–wide educational campaign.**

   The education subcommittee is developing a proposed budget for the first year's activities and considering a recommendation to the Committee to ask hospitals, insurance companies, businesses and DPH to disseminate the hand hygiene messaging in their publications, on their websites and through billboards and public service announcements. (Subcommittee minutes attached)

5. **The Committee should continue to meet to provide guidance and help implement educational efforts relating to the reporting of CLABSIs and any additional infection measures that the Committee determines are appropriate for public reporting in the future.**

Resources:

1. **The State of Connecticut must identify and make available the resources necessary to implement the above reporting and education recommendations.**

   It is important to note that implementation of the above recommendations has an impact, in some cases a significant one, on the resources of both the Connecticut Department of Public Health and Connecticut's hospitals. The Committee strongly believes that this mandatory requirement cannot be implemented without the state's commitment to dedicate resources to both entities.

   Resources will be needed by DPH for the following activities:

   - training of DPH staff involved in use of the NHSN database;
   - working with each hospital to train them to use the NHSN database, and to assure consistency and accuracy of surveillance within and between hospitals including conducting audits;
   - periodic analysis of data and preparation of public and other reports;
   - collaborative studies of infection control practices in hospitals with varying infection rates;
   - working with hospitals to assure the implementation of scientifically sound evidence-based processes of care, if not already in place, to prevent or minimize the incidence of infection;

- disseminate proven scientific prevention measures to minimize or eliminate healthcare-associated infections.

Department of Public Health Resources: The Department of Public Health (DPH) will need three new full time positions for these activities: a mid-level epidemiologist position (Epidemiologist 2 or 3) and two infection control positions (possibly, Nurse Consultant). In addition, funding will be necessary to cover a portion of the costs for the Supervisor of this new program. These positions will need the necessary space and equipment to perform their jobs. In addition, DPH would need information technology resources for desktop support, server support and backup, and server refresh and licensing support. We estimate the total costs for DPH to be approximately $250,000.

To implement the initial recommendations of the Education Subcommittee, a total of $55,000 is necessary.

Hospitals Resources: With respect to hospitals' implementation of a NHSN-based system, costs are likely to vary greatly, depending on infrastructure and personnel requirements. However, it is estimated that statewide implementation of the NHSN system on an ongoing basis, with related training requirements and increasing data collection and reporting requirements as additional measures are added over time, may involve costs per hospital ranging from some tens of thousand of dollars in some cases, to costs in excess of $100,000 for others if additional staff are needed.

APPENDIX A
Public Act 06-142

Substitute Senate Bill No. 160

Public Act No. 06-142

AN ACT CONCERNING HOSPITAL ACQUIRED INFECTIONS.

Be it enacted by the Senate and House of Representatives in General Assembly convened:

Section 1. (NEW) (*Effective from passage*) (a) As used in this section, "commissioner" means the Commissioner of Public Health; "department" means the Department of Public Health; "healthcare associated infection" means any localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent or its toxin that (1) occurs in a patient in a healthcare setting, (2) was not found to be present or incubating at the time of admission unless the infection was related to a previous admission to the same health care setting, and (3) if the setting is a hospital, meets the criteria for a specific infection site, as defined by the National Centers for Disease Control; and "hospital" means a hospital licensed under chapter 368v of the general statutes.

(b) There is established a Committee on Healthcare Associated Infections, which shall consist of the commissioner or the commissioner's designee, and the following members appointed by the commissioner: Two members representing the Connecticut Hospital Association; two members from organizations representing health care consumers; two members who are either hospital-based infectious disease specialists or epidemiologists with demonstrated knowledge and competence in infectious disease related issues; one representative of the Connecticut State Medical Society; one representative of a labor organization representing hospital based nurses; and two public members. All appointments to the committee shall be made no later than August 1, 2006, and the committee shall convene its first meeting no later than September 1, 2006.

(c) On or before April 1, 2007, the Committee on Healthcare Associated Infections shall:

(1) Advise the department with respect to the development, implementation, operation and monitoring of a mandatory reporting system for healthcare associated infections;

(2) Identify, evaluate and recommend to the department appropriate standardized measures, including aggregate and facility specific reporting measures for healthcare associated infections and processes designed to prevent healthcare associated infections in hospital settings and any other healthcare settings deemed appropriate by the committee. Each such recommended measure shall, to the extent applicable to the type of measure being considered, be (A) capable of being validated, (B) based upon nationally recognized and recommended standards, to the extent such standards exist, (C) based upon competent and reliable scientific evidence, (D) protective of practitioner information and information concerning individual patients, and (E) capable of being used and easily understood by consumers; and

(3) Identify, evaluate and recommend to the Department of Public Health appropriate methods for increasing public awareness about effective measures to reduce the spread of infections in communities and in hospital settings and any other healthcare settings deemed appropriate by the committee.

Sec. 2. (NEW) (*Effective from passage*) On or before October 1, 2007, the Department of Public Health shall, within available appropriations, implement the recommendations of the Committee on Healthcare Associated Infections established pursuant to section 1 of this act, with respect to the establishment of a mandatory reporting system for healthcare associated infections and appropriate standardized measures for the reporting of data related to healthcare associated infections.

Sec. 3. (NEW) (*Effective from passage*) (a) On or before October 1, 2007, the Department of Public Health shall submit a report to the joint standing committee of the General Assembly having cognizance of matters relating to public health concerning the plan for implementing the mandatory reporting system for healthcare associated infections recommended by the Committee on Healthcare Associated Infections pursuant to section 1 of this act, and the status of such implementation, in accordance with the provisions of section 11-4a of the general statutes.

(b) On or before October 1, 2008, and annually thereafter, the department shall submit a report to the joint standing committee of the General Assembly having cognizance of matters relating to public health on the information collected by the department pursuant to the mandatory reporting system for healthcare associated infections established under section 2 of this act, in accordance with the provisions

of section 11-4a of the general statutes. Such report shall be posted on the department's Internet web site and made available to the public.

Approved June 6, 2006

APPENDIX B
ADVISORY COMMITTEE MEMBERSHIP LIST

Healthcare Acquired Infections 2007

Chairperson:

Karen Buckley-Bates
Director of Government Relations
CT Department of Public Health

Members (both voting and non-voting):

Raymond S. Andrews
Trustee
The Donaghue Medical Research Foundation

Nancy L. Barrett, MS, MPH
PHIN Coordinator
Connecticut Department of Public Health

Jennifer Barrows
Director of Communications
Connecticut Hospital Association

Jacqueline Blake, Esq.
Coordinator, Community & Government Relations
Yale New Haven Health System

John M. Boyce, MD
Hospital Epidemiologist
Chief, Section of Infectious Disease
Hospital of St Raphael and
Clinical Professor of Medicine
Division of Infectious Diseases
Yale University School of Medicine
New Haven, Connecticut

Lillian A. Burns, MT, MPH, CIC
Infection Control & Prevention Department
Greenwich Hospital

Bonnie Capasso,
Patient Advocate

Harinath Chanda
IT Supervisor
CT Department of Public Health

Joanne R. Chapin, RNC, BBA
VP for Health Care
AFT Connecticut

Brian W. Cooper, MD
Director, Division of Infectious Disease, Allergy & Immunology Hartford Hospital
Professor of Clinical Medicine University of Connecticut School of Medicine

Brenda Grant, RN, MPH, CIC, CHES
Nurse Epidemiologist
Stamford Hospital

James L. Hadler, MD, MPH,
Director Infectious Diseases Section & State Epidemiologist
CT Department of Public Health

Kevin P. Lembo, MPA
State Healthcare Advocate

Jennifer Martin B.S.N., RN, CIC
Infection Control Practitioner
Connecticut Children's Medical Center

Harry N. Mazadoorian
Distinguished Senior Fellow
Center on Dispute Resolution
Quinnipiac University School of Law

Patrick J. Monahan II, Esq.
Garfunkel, Wild & Travis, P.C.

David Neville, Infection Control Coordinator
Saint Francis Hospital and Medical Center

Jon C. Olson, DPM, DrPH, Epidemiologist
Healthcare Quality, Statistics, Analysis, & Reporting
CT Department of Public Health

Julie Petrellis
Quality Improvement
Connecticut Hospital Association

Jean Rexford
Executive Director
CT Center for Patient Safety

Tanya M. Court
Director, Public Policy and Programs
The Business Council of Fairfield County

Wendy H. Furniss, RNC, MS
Branch Chief, Health Care Systems Branch
CT Department of Public Health

Richard A. Garibaldi, MD, FACP
Chairman, Department of Medicine
University of Connecticut School of Medicine and
Hospital Epidemiologist University of Connecticut
Health Center

Joseph Garner, M.D.
Director, Infectious Disease Division
Hospital Epidemiologist
Hospital of Central Connecticut

Susan MacArthur, RN, CIC, MPH
Quality Assurance
Hartford Hospital

Lloyd Mueller, PhD, Senior Epidemiologist
Healthcare Quality, Statistics, Analysis & Reporting
Connecticut Department of Public Health

James R. Sabetta, MD
Director Infectious Diseases
Greenwich Hospital

Diane L. Selvidio, RN, CIC
Manager, Infection Control
Lawrence & Memorial Hospital

Douglas C. Waite, MD
Director, Medical Affairs
Director, Infectious Diseases
Day Kimball Hospital

Diane Dumigan, RN, BSN, CIC
Infection Control/Hospital Epidemiology
Hospital Of Saint Raphael
New Haven, Connecticut

Louise-Marie Dembry, MD, MS
Associate Professor of Medicine (Infectious
Diseases) and Epidemiology,
Yale University School of Medicine
Hospital Epidemiologist, Yale-New Haven Hospital

APPENDIX C
COMMITTEE MEETING MINUTES

Healthcare Acquired Infections
October 27, 2006
CT Hospital Association
10 AM – Noon

Minutes

Attendees: Louise Dembry, Pat Mshar, Bonnie Capasso, Harry Mazadoorian, Ray Andrews, Wendy Furniss, Carrie Brady, Joanne Chapin, Jennifer Martin, Brian Cooper, Lillian Burns, Jackie Blake, Diane Dumigan, Susan MacArthur, Jean Rexford, Tanya Court, Joseph Garner, Karen Buckley-Bates, Jennifer Cox, Brenda Grant, John Boyce, Diane Selvidio, Jon Olson, Douglas Waite, Pat Monahan, Anne Elwell, Julie Petrellis

The meeting was called to order at 10:09 by Karen Buckley-Bates.

Following introductions, Karen Buckley-Bates gave a brief overview of the Legislative intent of Public Act 06-142 that established this committee.

Presentations:

Interest and Concerns of the Consumer

Jean Rexford, CT Coalition on Patient Safety

The presentation included a list of elements that the organization considers to be essential for the success of this group. Among the items listed were: mandatory reporting that is clear and easily understood by the public; hospital and surgical center specific reports; outcome measures; accurate data; funding for staff and reporting systems; timelines with deadlines for the first report; an ability to add more reporting measures in the future without further legislation. Strong emphasis should be placed on educating the public, patient confidentiality and enforcement measures for non-compliance. Doctors should be required to report back to hospitals on the ultimate outcomes of patients who acquire infections while in the hospital or shortly after release.

What is Healthcare Epidemiology?
Dr. Louise Dembry, Yale New Haven Hospital

Dr. Dembry gave a presentation that identified various measures that must be instituted to address the issue of infections acquired in the healthcare setting. A copy of the Power Point presentation is attached.

The meeting adjourned at 11:38.

The next meeting will be held on **November 16, 2006** at 10:00 a.m. at CHA

Essential elements for success

- **Mandatory public reporting**
- **Reports made available and readily understandable to the public**
- **Hospital and surgical centers specific reports**
- **Outcome measures (infection rates)**
- **Validation for accuracy of Data (PA and South Carolina)**
  Authority to audit
- **Funding for staff and reporting system**
- **Timeline with deadlines for first report**
- **Ability to add more reporting measures in the future without further legislation**
- **Public education**
- **Patient confidentiality**
- **Enforcement measures for non-compliance**

What is Healthcare Epidemiology?

Healthcare Epidemiology

- *The study of diseases acquired in the healthcare setting.*
  - Infectious or non-infectious events which occur in hospitalized patients as a result of being hospitalized, having surgery or other procedure, or of receiving a treatment.

Healthcare/Hospital Associated Infection *(HAI)*

Definition:

An infection associated in time with being in a health care facility. Generally, an infection that manifests itself 48-72 hours after admission or up to 48 hours after discharge.

Time period may vary by organism or type of HAI.

An Act Concerning Hospital Acquired Infections

Section 1.c.2:

Identify, evaluate and recommend to the department appropriate standardized measures, including aggregate and facility specific reporting measures for healthcare associated infections and processes designed to prevent healthcare associated infections… Each such recommended measure shall, to the extent applicable to the type of measure being considered, be:

(A) capable of being validated,

(B) based upon nationally recognized and recommended standards, to the extent such standards exist,

(C) based upon competent and reliable scientific evidence,

(D) protective of practitioner information and information concerning individual patients, and

(E) capable of being used and easily understood by consumers.

Healthcare Associated Infections

- Need to understand
  - Types of infections
  - Causes of infection
  - Characteristics of infected patients
  - How infections occur
- Rates vary by size of hospital
- Rates vary by type of hospital
- Rates vary by patient population

Healthcare Associated Infections

- CDC
  - National Healthcare Safety Network (NHSN; formerly NNIS)
    - Criteria for 13 major site infections and 49 specific sites of infection
      - Urinary tract infection (UTI)
        - » Most common
      - Surgical site infection (SSI)
        - » Most costly
      - Ventilator associated pneumonia (VAP)
        - » Highest mortality
      - Catheter related blood stream infection (BSI)
        - » Most preventable HAI

Hospital Epidemiology Programs

- Responsible for providing the knowledge and recommending the means by which transmission of HAI can be minimized.
- Activities
  - Education
  - Consultation
  - Surveillance
  - Cluster Evaluation
  - Program Assessment

Prevention and Control Programs

- Address significant problems
- Based on quality data
- Offer demonstrated effective solutions
- Cost-effective
- Accepted by users
- Require ongoing monitoring

Surveillance

"Systematic, active, ongoing observation of the occurrence and distribution of disease within a population and of the events or conditions that increase or decrease the risk of such disease occurrence."

Continuous process:

- define events to be surveyed
- collection of relevant data
- consolidating data
- analyzing/interpreting data
- ***using information to bring about change***

Surveillance

- Collecting the data
  - Defining events to be surveyed
    - Definitions
      - Scientifically sound
      - Applied uniformly
    - Is an infection present?
    - At which body site?
    - Is the infection healthcare associated?
  - Data to collect about infections
  - Denominators

Surveillance

- Case finding: data sources
  - Microbiology laboratory
  - Ward rounds/chart review
  - Post-discharge follow-up
  - Other sources
- Consolidating and tabulating data
- Validating the data
- Calculating rates

Surveillance

- Analysis
- Interpretation
- Reporting the data
  - Rates
    - by site of infection
    - by pathogen
    - by patient risk factors
    - by service
    - by type of hospital
    - trends over time
  - Getting the data to those who can effect change

Surveillance

- Targeted surveillance
- Unit-directed surveillance
- Rotating surveillance
- Priority-directed surveillance
- Incidence vs. prevalence methodologies

Data
The Epidemiologist's Sand

- If the sand is dirty or impure, the lens will be cloudy and distorted.
- If data is unreliable or invalid, the epidemiologist's understanding of nature will be clouded and distorted.

Hierholzer, Am J Med, 1991.

Organizations Influencing Hospital Epidemiology

- Federal
  - Statutes
  - HIP (DHQP) - CDC
  - OSHA
  - EPA
  - FDA
  - CMS
- State statutes and regulations
- JCAHO
- Professional organizations
  - SHEA
  - APIC
  - Others

Guidelines

- Evidence-based
  - "the conscientious and judicious use of current best evidence from clinical care research in the management of individual patients"
    - current best evidence from clinical care research: practitioners need to distinguish the best evidence from studies that have been done on the subject.
    - Expert group cull the literature on a topic and select and distill best evidence for drawing conclusions.
- Guidelines for assessing guidelines

How do hospital epidemiologists use guidelines?

- To establish performance standards
- To improve quality of care
- To comply with regulatory requirements
- To meet accreditation requirements
- To promote cost effective prevention methods

HICPAC Functions

- Issue recommendations for preventing/controlling healthcare associated infections through guidelines, resolutions, and informal communications
- Information exchange with CDC
- Interact with other CDC advisory committees
- Review studies, projects, and programs related to healthcare associated infections
- Assist in strategic planning and program review

HICPAC = Healthcare Infection Control Practices Advisory Committee

HICPAC Guideline Recommendations

- Category I: *strongly recommended for all hospitals*
  - IA: *firm scientific basis*
  - IB: *no definitive scientific studies*
    - *consensus of HICPAC*
    - *viewed as effective by experts*
    - *strong rationale and suggestive evidence*
- Category II: *suggested for many hospitals*
- "No recommendation; Unresolved issue"

Topics for Practice Guidelines

- Device Use
- Patient Care
- Cost-effectiveness
- Antimicrobial Therapy
- Procedures
- Quality Improvement
- Regulatory Requirements

Process vs. Outcome

- Process measures
  - Target adherence rate 100%
  - Do not require risk adjustment
  - Applies to variety of hospitals
  - Measurement straightforward
  - Must involve direct patient care providers
    - Ownership and accountability
  - Do not measure outcome

Process vs. Outcome

- Outcome measures
  - Measurement more complicated
    - Requires training, expertise
  - Data collection may be more tedious
  - May be more labor intensive for ICP
  - Do not measure processes of unit staff
    - Less ownership and accountability
  - Measure actual result

Process vs. Outcome: Compare Hospitals A and B

- **Hospital A**
  - **On time pre-operative antibiotic prophylaxis = 50%**
  - **Surgical site infection rate = 5%**
- **Hospital B**
  - **On time pre-operative antibiotic prophylaxis = 100%**
  - **Surgical site infection rate = 10%**

Which hospital does better?

Process vs. Outcome: Compare Hospitals A and B

- **Hospital A**
  - **On time pre-operative antibiotic prophylaxis = 50%**
  - **Surgical site infection rate = 5%**
    - **No post-discharge surveillance**
- **Hospital B**
  - **On time pre-operative antibiotic prophylaxis = 100%**
  - **Surgical site infection rate = 10%**
    - **Includes post-discharge surveillance**

Which hospital does better?

CDC NHSN

- National Health and Safety Network
  - > 300 hospitals enrolled
  - Anticipate more once fully operational
    - Catheter-related bloodstream infections
    - Surgical site infections
    - Ventilator-associated pneumonias
    - Non-infectious adverse events
  - – Use standard CDC definitions

CDC NHSN

- Advantages
  - Measures outcomes
  - Applies to variety of hospitals
  - Not much technology required
  - Potential future use for clearing house for state public reporting
- Consider
  - Trained surveyors needed
  - Data collection may be tedious and labor-intensive unless computerized
  - Process measures not utilized
  - Requires risk adjustment

JCAHO Measures

- Prophylactic antibiotics received within 1 hour prior to surgical incision
- Prophylactic antibiotic selection for surgical patients
- Prophylactic antibiotics discontinued within 24 hours after surgery end time
- Cardiac surgery patients with controlled 6 a.m. postoperative serum glucose
- Surgery patients with appropriate hair removal
- Colorectal surgery patients with immediate postoperative hypothermia

JCAHO

- Advantage
  - Use for accreditation process
  - Coincides with performance measures of other initiatives, especially SIP
- Consider
  - Appropriate antibiotic definition
  - # and types of surgery (SIP)
  - Public reporting
  - No outcome measure

Institute for Healthcare Improvement (IHI) Campaign

- **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 peri-operative care
- **Prevent Ventilator-Associated Pneumonia**…by implementing a series of interdependent, scientifically grounded steps called the "Ventilator Bundle"

IHI

- Advantages
  - Widespread use – administrator support
  - Encompasses components of the other initiatives
  - Process measures
- Consider
  - Not outcomes measures

Things to consider…

- Characteristics of the organization
  - Size, type of facility and population served
    - Services and procedures
  - Infection control professional FTE
    - Process measures more feasible?
    - Implementation gives ownership to unit
  - Surveillance capability
  - Ideal: combination of process and outcome

An Act Concerning Hospital Acquired Infections

Section 1.c.2:

Identify, evaluate and recommend to the department appropriate standardized measures, including aggregate and facility specific reporting measures for healthcare associated infections and processes designed to prevent healthcare associated infections… Each such recommended measure shall, to the extent applicable to the type of measure being considered, be:

(A) capable of being validated,

(B) based upon nationally recognized and recommended standards, to the extent such standards exist,

(C) based upon competent and reliable scientific evidence,

(D) protective of practitioner information and information concerning individual patients, and

(E) capable of being used and easily understood by consumers.

Additional Information

Healthcare Associated Infections

- Epidemiologically important pathogens
  - Infectious agents with:
    - Propensity for transmission within healthcare facilities
      - Bacteria, fungi, viruses, etc.
    - Antimicrobial resistance implications
      - Resistance to first line therapies
      - Unusual or usual agents with unusual pattern of resistance within a facility
      - Difficult to treat due to innate or acquired resistance to multiple classes of antimicrobial agents
    - Associated with serious clinical disease
    - Newly discovered or re-emerging pathogen.

HICPAC Guidelines

- Prevention of catheter-associated urinary tract infections (1983)
- Handwashing and hospital environmental control (1986)
- Preventing the spread of vancomycin resistance (1995)*
- Isolation precautions in hospitals (1996)
- Immunization of healthcare workers (1997)
- Infection control in health care personnel (1998)
- Prevention of surgical site infections (1999)
- Hand hygiene in healthcare settings (2002)
- Intravascular-device related infections (2002)
- Preventing healthcare associated pneumonia (2003)
- Using smallpox vaccine in a pre-event vaccination program (2003)
- Environmental infection control in healthcare facilities (2003)

*priority subtopic of "Appropriate use of antimicrobials"

Quality of Care Initiatives

- Institute for Healthcare Improvement
- Centers for Medicaid and Medicare Services (CMS)
  Hospital Quality Alliance
  - *Hospital Compare*
- JCAHO Performance Measures
- Surgical Infection Prevention Project
- VA Performance Measures
- Leapfrog Group/National Quality Forum
- Agency for Healthcare Research and Quality
- CDC/National Health & Safety Network
- State Public Reporting Programs
- Local or institutional initiatives

Care Bundles

- Groupings of best practices with respect to a disease process that individually improve care, but when applied together result in substantially greater improvement.
- The science supporting each bundle component is sufficiently established to be considered the standard of care.

IHI components in other initiatives

- Leapfrog/NQF 5/*30 measures in IHI*
  - Culture of healthcare safety
  - Evaluate for aspiration risk
  - Central line blood stream infection (CLBSI) prevention
  - Prevention of surgical site infections
  - Hand hygiene
- AHRQ 3/*25 Patient safety practices in IHI*
  - Appropriate use of antibiotic prophylaxis
  - Maximal sterile barriers for CLBSI prevention
  - Head of bed elevated for ventilator associated pneumonia prevention
- IOM 1/*20 priority areas*
  - HAIs

Berwick JAMA 2006;295:324-7

Hospital Epidemiology Programs

- Additional responsibilities may include:
  - Quality management
  - Occupational health
  - Risk management
  - Microbiology consultations
  - Clinical pharmacy consultations

Healthcare Acquired Infections
November 16, 2006
CT Hospital Association
9:30 a.m. – 11:35 a.m.
Minutes

Attendees: Karen Buckley-Bates, Wendy Furniss, Pat Monahan, Julie Petrellis, Tanya Court, jean Rexford, Ray Andrews, Kevin Lembo, Harry Mazadorian, Diane Dumigan, David Neville, Jackie Blake, David Pearson, Jon Olson, Lloyd Mueller, Chuey Kwak, Brian Cooper, Douglas Waite, Jennifer Martin, Lynn Sosa, Jim Hadler, Joanne Chapin, Susan McArthur, Jennifer Barrows, Diane Selvidio, Bonnie Capasso, Louise Dembry, Richard Garibaldi, Christy Vale

The meeting was called to order at 9:35 a.m. by Karen Buckley-Bates.

The minutes of the October 27, 2006 meeting were approved.

Pat Monahan facilitated phone conversations with:

- Beth Eastman of the Agency for Healthcare Administration in Florida.
- Valerie Lyon, Infection Control Nurse, Capitol Region Medical Center, Jefferson City, MO.
- Eddie Hedrick, Emerging Infections Coordinator, Missouri Department of Health and Senior Services.

Each shared an overview of legislation enacted in their state, as well as information on infection control policies and procedures, data collection systems, and reporting methods that are being implemented.

Bonnie Capasso reported on the experience of her son who contracted a hospital- acquired infection following surgery.

The next meeting is scheduled for December 15th at 9:00 a.m. at CHA. Pennsylvania and New York will report at that time.

Healthcare Acquired Infections
December 15, 2006
CT Hospital Association
9:00 a.m. – 11:30 a.m.

Minutes

Attendees: Karen Buckley-Bates, Wendy Furniss, Pat Monahan, Julie Petrellis, Jean Rexford, Ray Andrews, Kevin Lembo, Harry Mazadoorian, Diane Dumigan, Jon Olson, Brian Cooper, Douglas Waite, Susan McArthur, Jennifer Barrows, Diane Selvidio, Matt Cartter, Jennifer Cox, Chuey Kwak, Eric George, Jospeh Garner, Louise Dembry, Richard Garibaldi, Christy Vale, Brenda Grant

The meeting was called to order at 9:10 a.m. by Karen Buckley-Bates.

The minutes of the November 16, 2006 meeting were approved.

Susan Manganello, the parent of a child who suffered with a hospital acquired infection, shared her experience with the group. She stressed that many things can prevent MRSA but little can be done once the infection has taken hold.

Julie Petrellis facilitated phone conversations with:

- **Marc Volavka, Executive Director of the Pennsylvania Health Care Cost Containment Council**

The Pennsylvania Council is much like the CT HAI Committee. It began collecting data in January of 2004. Discrepancies in CDC definitions were clarified and a manual was created for hospital use. They used the current UB Bill and used two state fields to identify if a HAI was present and what type. 95% of admissions are not HAI. Screening codes narrowed what cases needed further review. They report total admissions, total HAIs, infection rate per 1000 admissions, type of infection, mortality, average length of stay and average charge. Disparities in reporting were addressed. After a potential under reporting model was created and hospitals were audited, reporting drastically improved. 2005 data was publicly reported. There was no additional cost to his staff, nor any additional cost to use the UP fields. There were some incremental costs to hospitals. More ICPs were hired in Pennsylvania but the reduction in HAIs more than offset those costs.

Lessons Learned: Don't reinvent the wheel; Don't let "perfect" be the enemy of the good; Educate the media (the print media understood immediately, the TV media focused on the more sensational aspects.

- **Rachel Stricof, Epidemiologist, New York State Department of Health**

New York standardized procedures and definitions. 82% of infections were identified post surgery. NY uses the CDC system. It is "tried and true" and there was no additional cost to develop it. Also, the NHSN

system is a very valuable tool and is free. Staff includes a Program Manager, Data Manager and 5 regional people, each were assigned 50 hospitals. The legislature appropriated $564,000 the first year to establish positions. No money was appropriated for hospitals. 2007 is the pilot year. Data collection and public reporting will take place in 2008. The buy-in from hospitals has been good.

- **Neil Fishman, Epidemiologist, Associate Professor of Medicine, Division of Infectious Diseases, University of Pennsylvania**

  From a hospital perspective, public reporting requires accuracy and integrity of information and data. The staff of ICPs doubled. Because ICPs are off the floors gathering data, infection control programs (hand washing programs, etc.) have been scaled back. There is a significant increase in expenditures. It is difficult to make comparisons because cases are not necessarily comparable, (i.e., delivery of a baby and a bone marrow transplant.) Mortality rates are not always attributable to infection. There needs to be a method to address inconsistencies. He suggests that the system start smaller, be perfected and then expanded. The NY Council is not heavy on physicians. There is an advisory group but they have ignored the concerns of the hospitals. No state funding has been made available to hospitals to fund infrastructure improvements. He questions if hospitals will be able to use the data to decrease infections. Some data is useful to hospitals but not all. Prior to legislation data was collected from the ICU and the oncology unit.

Harry Mazadoorian suggested that the HAI committee be expanded to include business and other partners. Karen Buckley-Bates responded that they will be invited to the next meeting.

Theresa Horan will be contacted to report on the NHSN system at the next meeting.

Information received thus far needs to be discussed to design a blueprint for what a Connecticut Infection Control System will look like. A DPH Information Technology person needs to be involved in the process soon.

Other partners who might benefit financially from decreases in infections rates might be called on to help fund this project.

The meeting adjourned at 11:35 a.m.

The next meeting will take place on **January 19, 2007 at 9:30 a.m. at CHA**

Healthcare Acquired Infections
February 16, 2007
CT Hospital Association
9:30 a.m. – 11:30 a.m.
Minutes

Attendees: Jon Olson, Hari Chanda, Julie Petrillis, Louise Dembry, Richard Garibaldi, Bonnie Capasso, Harry Mazadoorian, David Neville, Lynn Sosa, Karen Buckley-Bates, Wendy Furniss, Eva Golebiewski, Jim Hadler, Brenda Grant, Chuey Kwak, Jennifer Martin, Diane Dumigan, Joseph Garner, Ray Andrews, Douglas Waite, Joanne Chapin, Jackie Blake, Kevin Lembo, Pat Monahan, Jean Rexford, Harinath Chandra, Jennifer Barrows.

The meeting was called to order at 9:35 a.m. by Karen Buckley-Bates.

The minutes of the January 19, 2006 meeting were approved.

Sharon Roberson from CMS in Boston was connected to the meeting via telephone.

After several meetings of information gathering on systems used in other states, the group centered their discussion on whether Connecticut should participate in the NHSN system or develop one of their own.

Points in favor of using the NHSN system include:

- The NHSN system is still new and CDC has the time and willingness to work with us in meeting Connecticut's needs.

- Building our own infrastructure would require the expense of assembling a team to design, implement and maintain the system. The NHSN system would be hosted by CDC therefore they would be responsible for updates and upgrades.

- Using NHSN would require less FTE's at DPH.

- NHSN appears to be a better use of Connecticut's limited resources.

The group discussed whether Connecticut should be reporting on all infections but only focusing on a few, or reporting on one at a time and adding on, one infection at a time.

Public education is key and should be addressed first. Data needs to be explained. Raw numbers do not tell the full story and the public needs to be enlightened before information is released.

Items of general consensus were:

- NHSN is the best option for Connecticut

- Focusing on one module (Central Line infection) at a time is the most effective way to proceed
- Explore adding in a process measure with NHSN

The next meeting will address the education component. A draft report will be ready for the March 16th meeting.

The meeting adjourned at 11:25 a.m.

The next meeting will take place on **February 23, 2007 at 9:30 a.m. at CHA**

National Healthcare Safety Network

Connecticut Committee on Healthcare Associated Infections (HAI)

Jan 19, 2007

R. Monina Klevens, DDS, MPH
Division for Healthcare Quality Promotion
National Center for Infectious Diseases

SAFER • HEALTHIER • PEOPLE™

Objectives

- Context for NHSN
- NHSN
  - Overview of application
  - Support states implementing reporting systems
    - Training
  - Confidentiality of data
- Address your questions

CDC's Role

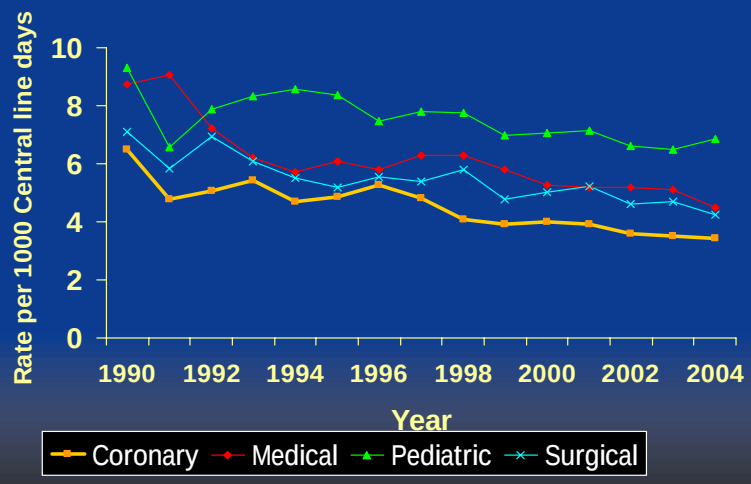
- Control
  - Since 1950s, provide outbreak investigation assistance
- Surveillance
  - Since 1970, National Nosocomial Infections Surveillance (NNIS) system
- Prevention
  - Since 1981, publish national evidence-based guidelines

NNIS: A Model for Patient Safety

- NNIS System was a model for patient safety[1,2]
  - High quality data used for local performance improvement
  - Reductions in national infection rates have been achieved

[1]Leape LL. Reporting of adverse events. NEJM 2002;347:1633-8.
[2]Burke JP. Infection control—a problem for patient safety. NEJM 2003;348:651-6.

Central Line-associated BSI Rates, By ICU Type,1990-2004



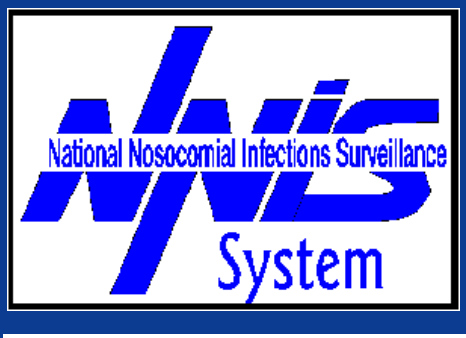
Source: NNIS System, incomplete for 2004

Key Features for Success of a System Monitoring Healthcare-Associated Infections

- Standard definitions for events
- Specified monitoring protocols
- Feedback to participants
- Trained personnel for data collection and for interventions (e.g., ICPs)

Gaynes R, et al. *Emerg Infect Dis* 2001;7:295-8.

1970-2004



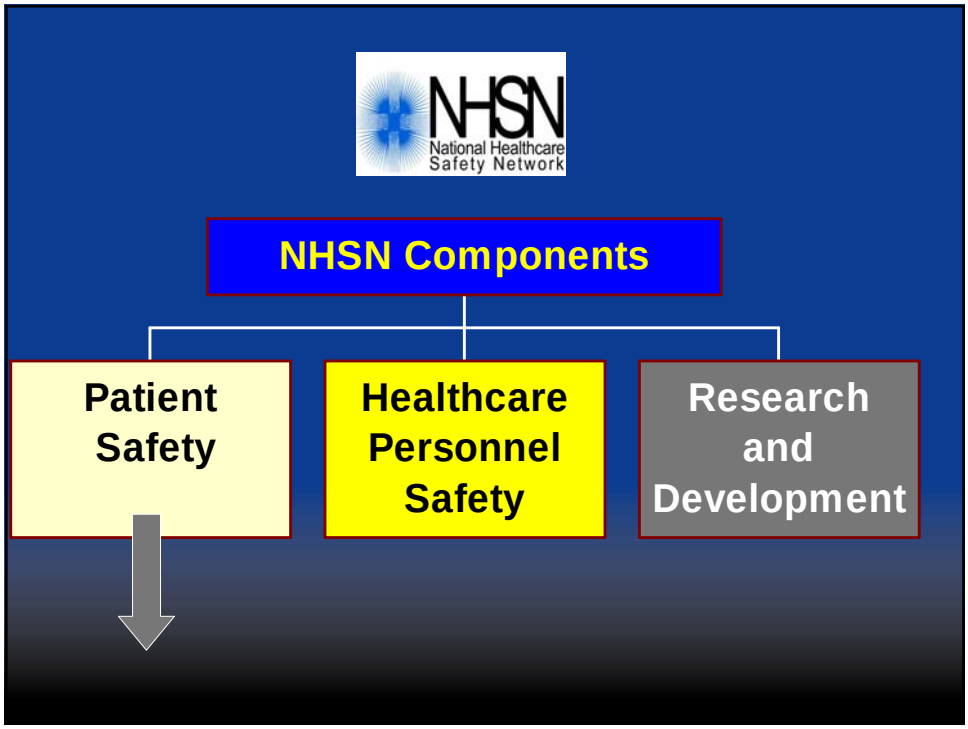
2005-

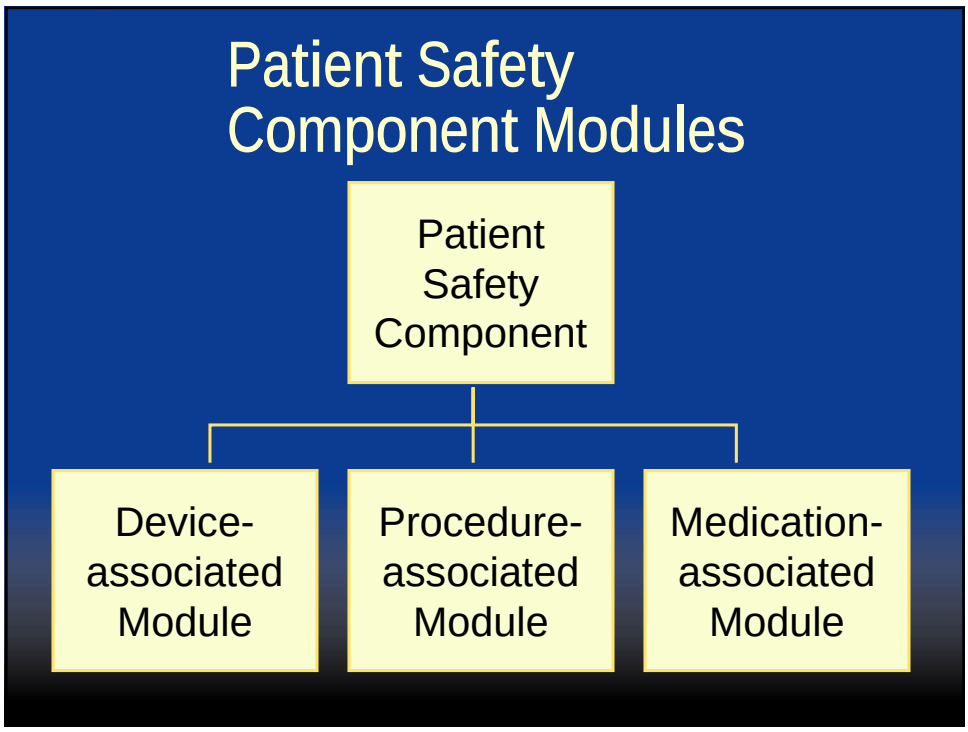
- Description of the NHSN reporting tool
  - Voluntary, confidential reporting system
  - Secure, digital certificate, web based reporting system
  - No enrollment fees

- Combines facility-level clinical performance measurement with national-level public health surveillance
- Participating healthcare facilities use the NHSN application to enter, analyze, and share data
- CDC uses data collected through NHSN for aggregate analysis and reporting

NHSN Purposes

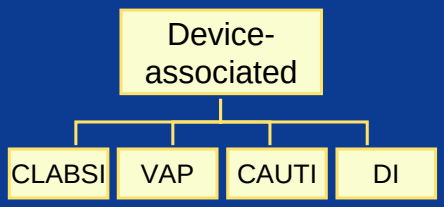
- Describe the epidemiology of adverse events among patients and personnel in U.S. healthcare facilities
- Promote epidemiologically-sound surveillance methodology
- Establish comparative rates that can be used for local quality improvement efforts
- Conduct collaborative research with members


NHSN
National Healthcare Safety Network
NHSN Components
Patient Safety
Healthcare Personnel Safety
Research and Development


Patient Safety Component Modules
Patient Safety Component
Device-associated Module
Procedure-associated Module
Medication-associated Module

CDC 1

Patient Safety Component Modules



CLABSI **Central line-associated bloodstream infection**

VAP **Ventilator-associated pneumonia**

CAUTI **Catheter-associated urinary tract infection**

DI **Dialysis incident**

Data Collection and Reporting Requirements Patient Safety Component

- Complete an annual survey
- Complete one or more Patient Safety Modules
  - Submit a reporting plan each month
  - Submit data for at least one module for a minimum of 6 months of the calendar year

Data Collection and Reporting Requirements Patient Safety Component (cont.)

- Adhere to the protocol(s)
  - Properly use the CDC definitions and codes for all data collection
  - Report events and appropriate summary or denominator data within 30 days of the end of the month

Data Collection and Reporting Requirements Patient Safety Component

- Pass quality control acceptance checks that assess the data for completeness and accuracy
- Agree to report outbreaks of adverse events to state health authorities

Staffing Recommendations Patient Safety Component

- A trained Infection Control Professional (ICP) or Hospital Epidemiologist should oversee the HAI surveillance program
  - No FTE requirements
- Other personnel can be trained to
  - Screen for events (e.g., infections)
  - Collect, enter, and analyze data

Authority and Confidentiality for NHSN

- Public Health Service Act (42 USC 242b, 242k, and 242m(d))
- Confidentiality Protection
  - Sections 304, 306, and 308(d) of the PHS Act

"The information contained in this surveillance system that would permit identification of any individual or institution is collected with a guarantee that it will be held in strict confidence, will be used only for the purposes stated, and will not be disclosed or released without the consent of the individual, or the institution in accordance with Sections 304, 306, and 308(d) of the Public Health Service Act (42 USC 242b, 242k, and 242m(d))."

National Healthcare Safety Network (NHSN) Supports State Efforts to Monitor Healthcare-Associated Infections

- Provide standardized protocols and definitions
- Identify and monitor risk factors for adverse events/injuries
- Provide access to prevention guidelines and other quality improvement tools
- Feedback risk-adjusted aggregated data for comparison

How Data Are Shared in NHSN

- A group can enroll in NHSN (e.g. Healthcare corporations, State Health Departments)
- A facility can join the group and share all or some of its data by conferring rights to data (flexible)
  - Facilities within the group cannot see each other's data (aggregate total)
- Without joining a group, a facility can download raw data, analyzed data sets, or data reports for sharing

Support for States

- Collaboration with CSTE
- NHSN State Users Group
  - Conference calls monthly
  - Website to share materials
- Training for all members
  - Webinars
  - Plans for distance learning using Lectora

NHSN Rollout: States implementing mandatory reporting are first priority

State	Estimated number of facilities	2007 timeline
New York	200	Jan
Vermont	14	Jan
South Carolina	61	Mar
Colorado	90	May
Tennessee	75	Jun
Virginia	150	Jun

NHSN application versions

Version	Deployment	Salient features
1.0	Oct 2005	Patient Safety Component - NNIS and DSN integrated
1.1	Nov 2006	▪ Improved analysis and output ▪ Online NHSN manual and help system
1.2	Jan 2007	▪ HCW vaccination module (flu) ▪ Improved confer rights to groups feature

Resources

CDC
http://www.cdc.gov/ncidod/dhqp/nhsn_members.html

APIC
http://www.apic.org

IDSA
http://www.idsociety.org

SHEA
http://www.shea-online.org/news/publicreporting.cfm

Questions?

APPENDIX D

The *Essentials of Public Reporting of Healthcare-Associated Infections: a Tool Kit*

Essentials of Public Reporting of Healthcare-Associated Infections: A Tool Kit

Prepared by the Healthcare-Associated Infection Working Group of the Joint Public Policy Committee[1]

Purpose:

This tool kit was created to assist states and healthcare facilities facing legislative mandates to publicly report healthcare-associated infections (HAIs) by providing guidance on components necessary for a meaningful reporting system. These components include the creation of an agency with the necessary expertise and resources to oversee the system; use of adequately trained and resourced data collectors; use standard case-finding methodologies, definitions, and risk-adjustment techniques of both outcome and process measures; and strategies to prevent unintended consequences of public reporting. The tool kit also includes recommendations for which indicator measures should be used for public reporting of HAIs.

The tool kit reaffirms the principles outlined in the Centers for Disease Control and Prevention's document, *"Guidance on Public Reporting of Healthcare-Associated Infections: Recommendations of the Healthcare Infection Control Practices Advisory Committee"* (http://www.cdc.gov/ncidod/dhqp/pdf/hicpac/PublicReportingGuide.pdf) and acknowledges the critical role of the CDC's National Healthcare Safety Network (NHSN), a web-based surveillance system for capturing data on adverse events (both infectious and noninfectious) associated with healthcare delivery. NHSN provides protocols, data collection forms, and data analysis comparing the user's rates with national aggregates. (http://www.cdc.gov/ncidod/dhqp/nhsn_members.html).

The working group did not address process measures and the reader is directed to organizations such as the CDC (http://www.cdc.gov/ncidod/dhqp/index.html), the Institute for Healthcare Improvement (http://www.ihi.org), and the National Quality Forum (http://www.qualityforum.org/) for additional information. The exception is a discussion on process measures that pertain to healthcare worker (HCW) vaccination rates.

Members of the working group considered strategies for public reporting of healthcare facility-associated *Clostridium difficile* associated disease (CDAD) since several states have or are recommending reporting to state health departments; however, the surveillance recommendations for CDAD have not yet been published and consequently this topic has not been discussed in this initial document.

The tool kit for public reporting of HAIs is a dynamic document and as the science unfolds and experience is gained, the tool kit will be updated as needed. For example, updating may be needed after the National Quality Forum releases recommendations from its project on National Voluntary Consensus Standards for the Reporting of Healthcare-associated Infection Data.

Background:

HAIs constitute a major public health problem in the United States affecting 5 to 10 percent of hospitalized patients annually, resulting in 2 million infections, 90,000 deaths and adding $4.5 to $5.7 billion in healthcare costs.

An increasing number of states have enacted legislation to mandate public reporting of HAIs and additional states continue to propose similar legislation (http://www.apic.org/Content/NavigationMenu/GovernmentAdvocacy/MandatoryReporting/state_legislation/state_legislation.htm). The legislative scope proposed by each state has varied and is not standardized. Therefore, we have developed this tool kit to address the need, for a standard approach for public reporting that could be adopted by all states. In addition, we refer the reader to model legislation prepared by SHEA and endorsed by APIC and the Infectious Disease Society of America (IDSA). (http://www.shea-online.org/Assets/files/model_Legislation_-_APIC__IDSA__SHEA.pdf)

The Tool Kit

It is the consensus of the working group that in order to achieve the intended goals of public reporting of HAIs, which are, to improve the quality of healthcare delivery by preventing infections and provide credible information to the consumer, states must ensure that essential components are in place before enacting legislation. These components and recommended indicator measures for inclusion in public reporting systems are described in the following sections.

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[1]The following individuals representing the Society for Healthcare Epidemiology of America (SHEA), Association for Professionals in Infection Control and Epidemiology (APIC), Council of State and Territorial Epidemiologists (CSTE), and Centers for Disease Control and Prevention (CDC) participated in this Working Group: Ray Chinn, MD (SHEA), Teresa Horan, MPH (CDC), Shannon Oriola, RN, CIC, COHN (APIC), Al DeMaria, MD (CSTE), Eddie Hedrick, BS, MT(ASCP), CIC (APIC), Mi*chael* Tapper, MD (SHEA), Gary Noskin, MD (SHEA), Robert Weinstein, MD (SHEA), Sharon Krystofiak, MS, MT(ASCP), CIC (APIC), Loretta Fauerbach, MS, CIC (APIC), Mike Edmond, MD, MPH (SHEA), Ellen Mangione, MD, MPH (CSTE).

A. Identification or Creation of an Agency at the State Level

First and foremost, the enacted legislation must identify a responsible state-level agency or part of an agency with expertise in infection prevention, risk adjustment issues, healthcare epidemiology, and assessment of statistical relevance. Additionally, the agency responsible for collecting and analyzing the data must have appropriately trained staff to accomplish this task, as well as to assist hospitals and the public in interpreting the reported data. Prior to public disclosure, surveillance data should be submitted to and analyzed by this agency. To design and implement an effective public reporting system that encompasses all the recommendations of this working group, additional resources will likely be necessary at the state level (refer to the Missouri and Massachusetts legislation).

B. Personnel for Data Collection and Quality Improvement

There are substantive concerns in the data collection process and quality improvement efforts when these tasks are delegated to personnel with little or no training in infection surveillance and prevention. Studies have demonstrated that there is a significant discordance in the quality of data retrieved by those with training in infection prevention and control when compared to those with little or no training.[2] Persons supplying healthcare data should be able to consult with appropriate infection prevention and epidemiology personnel to assist them in data submission and to interpret data as needed. The working group recommends the engagement of personnel with appropriate training and/or certification in infection prevention and control for the purposes of collecting data on HAIs and discourages the use of administrative data alone to identify cases of HAIs because of the inherent inaccuracies.

Each institution must assess the scope of its infection prevention program to ensure that adequate resources are available for any additional surveillance activities needed to meet the legislative mandates of public reporting. In today's healthcare environment, in addition to their traditional roles, infection control professionals (ICPs) have expanded obligations in various aspects of healthcare delivery that include, but are not limited to, construction and renovation activities, employee and occupational health, bioterrorism and pandemic influenza preparation, disaster planning, and outpatient services. Therefore, additional personnel and resources must offset any further burden placed on ICPs by public reporting.

C. Strategies to Prevent Unintended Consequences of Public Reporting

The impact of public reporting of HAIs on the delivery of healthcare services is unknown. Proponents of public reporting of HAIs conclude that public reporting would promote competition that would stimulate process improvement efforts and result in optimal patient outcomes.

However, there are concerns that public reporting of HAIs may be associated with unintended consequences that include avoidance of sicker patients to improve outcomes and focusing on a "rate" rather than on prevention of HAIs.[3] To avoid these unintended consequences and to facilitate meaningful comparisons, states and healthcare facilities that embark on public reporting of outcome measures must ensure that the data being collected meet standards set by persons knowledgeable in infection prevention and epidemiology, that the definitions of selected outcomes measures do not require subjective interpretation, and that the varying degrees of patient acuity is reflected by appropriate risk adjustment.

Moreover, some experts argue that public reporting of HAIs discourages internal notification of patient safety incidents and encourages lawsuits while having little or negative effect on patient safety.[4] Therefore, the healthcare institution must protect the confidentiality of the private patient information collected by using a format for displaying outcome measures that does not permit individual patient identification but rather summary or aggregate rates.

It is essential that there be minimal lag time between the submission of data and the actual publication of the surveillance data to avoid the display of outdated reports that may not be indicative of the current status of the healthcare facility. If such delay is unavoidable, institutions must be afforded the opportunity to comment on remedial actions that have been put in place to address the suboptimal outcome and may have already had a favorable impact on the subsequent outcome.

Some have recommended that healthcare institutions report surveillance data quarterly rather than annually as a solution to assure timeliness of public disclosure; however, the working group recommends reporting outcome measures annually to assure robust denominators and stable rates. Another option to address the timeliness of public reporting is to develop a rolling 12-month reporting period. Entrusting an agency knowledgeable in epidemiology to oversee public reporting would help assess the appropriateness of releasing data prior to public disclosure and thus, decrease the risk of reporting bias.

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[2]Sherman ER, Heydon KH, St John KH, Teszner E, Rettig SL, Alexander SK, Zaoutis TZ, Coffin SE. Administrative data fail to accurately identify cases of healthcare-associated infection. Infect Control Hosp Epidemiol 2006;27:332-337

[3]Werner RM, Asch DA. The unintended consequences of publicly reporting quality information. JAMA 2005:293:1239-1244

[4]Weissman JS, Annas CL, Epstein AM, Schneider EC, Clarridge B, Kirle L, Gatsonis C, Feibelmann S, Ridley N. Error reporting and disclosure systems: views from hospital leaders. JAMA 2005:293:1359-1366

Finally, to assist the consumer in the interpretation of outcome data, the format developed for public reporting should be user friendly with the information clearly displayed and the limitations succinctly described.

D. Recommended Outcome Measures

1. Central Line-associated Bloodstream Infection (CLABSI) in the Intensive Care Unit

a. Use NHSN definitions and methodology for rate determination (laboratory confirmed CLABSI, clinical case-finding methodology, definitions of central lines, and stratification by type of intensive care unit).

b. When appropriate, collect demographics of the healthcare facilities that may be used to adjust for differences between at-risk populations and patient acuity between facilities. Inclusion of such data gives the reader the ability to better compare healthcare facilities. Such demographics could include:

- Number of beds
- Solid organ transplants
- Oncology
- Allogeneic bone marrow transplants
- Trauma services
- Cardiac surgery
- Burn center
- Neurosurgery services
- Pediatric care exclusively

2. Surgical Site Infection (SSI)

The working group emphasizes the importance of definitions, of being consistent in case finding methodologies, of applying risk-adjustment strategies when comparing outcome data, and therefore, recommends the following:

a. Each state should review the scope of surgical procedures performed by healthcare facilities and choose those surgical procedures for SSI surveillance that are performed with adequate frequency to permit meaningful comparisons between institutions.

b. The following are examples of procedures that are reasonable options for public reporting of SSIs:

- Coronary artery bypass surgery
- Colon resection
- Total hip arthroplasty
- Total knee arthroplasty
- Laminectomy
- Total abdominal hysterectomy

c. Use NHSN definitions to identify SSIs.

d. Calculate and report SSI rates stratified according to the basic and/or modified NNIS Risk Index.[5] The index includes the following elements: ASA[6] score, wound class, duration of surgery, and use of laparoscope.

e. The working group acknowledges that a comprehensive surveillance program for detection of SSIs may include post-discharge surveillance for identification of SSIs. However, there is significant variability in institutional methodology in obtaining data on patients who develop SSIs after discharge but who do not require rehospitalization for management of their SSIs (usually superficial infections), either at the original facility where the surgical procedure was performed or at another facility. Therefore, in order to improve the likelihood of having meaningful comparative data for public disclosure and until there is consensus on the optimal post-discharge surveillance methodology, the working group recommends that the initial scope of SSI surveillance for public reporting include both:

- Patients who develop SSIs during initial hospitalization, and
- Patients who develop SSIs following discharge and require readmission to the hospital. Such patients can be identified using the following techniques and data sources:
  - Review of operating room logs for debridement and surgical drainage of abscesses.
  - Review of interventional radiology logs for percutaneous drainage of abscesses.
  - Review of microbiology laboratory's daily log of positive cultures.
  - Notification of readmission for treatment of SSI by surgical staff to ICPs.

Not all patients who develop SSIs requiring hospitalization are readmitted to the same institutions where the surgical procedures were performed; therefore, institutions should have a process that enables personnel charged with data collection to inform the original facility where the patient's surgical procedure was performed of the development of SSI.

[5]NNIS, National Nosocomial Infections Surveillance

[6]ASA, American Society of Anesthesiologists

3. **Ventilator-associated Pneumonia and Catheter-associated Urinary Tract Infection**
   The working group agrees with the CDC/HICPAC document, *"Guidance on Public Reporting of Healthcare-Associated Infections"* (referenced above) and recommends exclusion of outcome measures, but inclusion of process measures (see IHI, CDC), related to ventilator-associated pneumonia and catheter-associated urinary tract infection because the existing surveillance criteria are difficult to apply consistently making case counts unreliable.

E. Recommended Process Measure: Healthcare Worker Influenza Vaccination Rates

1. To refine the calculation of HCW influenza vaccination rates for a healthcare facility, use NHSN definitions of "healthcare workers with patient contact" (hands on, face-to-face contact with patients for the purpose of diagnosis, treatment, and monitoring). However, the working group recognizes the importance of vaccinating all HCWs independent of the degree of patient contact and that additional vaccination measurement rates are useful for healthcare organizations. (http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5502a1.htm).

2. To enable Employee/Occupational Health and Infection Prevention departments to target educational efforts, calculate HCW vaccination rates as stratified healthcare delivery groups or high-risk patient care areas. Examples include:
   a. Physicians caring for patients in high-risk areas (emergency department, intensive care units, oncology units, and transplant units). This strategy may be helpful in private healthcare facilities where the majority of physicians are licensed independent practitioners.
   b. Healthcare providers by discipline (nursing, respiratory care practitioners, occupational/physical/speech therapy or by unit (transplant, emergency department, intensive care units).

3. Follow CDC/HICPAC and SHEA recommendations to improve HCW influenza vaccination rates (http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5502a1.htm; http://www.shea-online.org/Assets/files/HCW_Flu_Position_Paper_FINAL_9-28.pdf):
   a. Provide influenza vaccination to healthcare workers at the work site and at no cost during all work shifts of the healthcare facility.
   b. Enhance educational opportunities.
   c. Use strategies that have been demonstrated to increase influenza vaccination rates, such as vaccination clinics, mobile carts, vaccination access during all work shifts, and modeling and support by institutional leaders.
   d. Incorporate a signed declination (from those who decline influenza vaccination for reasons other than medical contraindications) component into a comprehensive healthcare worker vaccination program when HCW vaccination rates remain below targeted institutional goals despite implementing evidence-based strategies as outlined in a-c.

Additional tools for guidance on surveillance:

The following documents are available at http://www.cdc.gov/ncidod/dhqp/nhsn_members.html :

1. NHSN definitions of surgical site infection and primary bloodstream infection.
2. NHSN Patient Safety Component Protocol for surveillance of device-associated, procedure-associated, and medication-associated events and patient care practices.
3. Outline for Healthcare-associated Infection Surveillance.

Research Needs

Research is needed to assess the impact that public disclosure of HAIs has on decreasing the risk of HAIs, meeting the public's need for such data, and determining the cost to individual institutions and to the state of implementing such public reporting.

APPENDIX E
EDUCATION SUBCOMMITTEE MINUTES

Education Sub-Committee Meeting Minutes

Date: March 5, 2007
Time: 1:00 –3:00 PM
Location: Connecticut Hospital Association
Committee Members: Susan MacArthur, Hartford Hospital, Julie Petrellis, CT Hospital Association; Jean Rexford, CT Center for Patient Safety; Bonnie Capasso, Parent /consumer/volunteer (Yale); Jennifer Martin, Connecticut Children's Medical Center (excused)

Purpose: To identify, evaluate and recommend to the Department of Public Health appropriate methods for increasing public awareness about effective measures to reduce the spread of infections in communities and in hospital settings and any other healthcare settings deemed appropriate by the committee

Recommendations:

1. Contract with a Marketing Firm (pro bono or nominal fee)
2. Contact health care settings and corporate sponsors willing to "buy" in to our campaign
3. Focus the message on hand hygiene for the entire year.
4. Campaign will include creation of Public Service Announcements, billboards and customer friendly information on web sites (e.g., Hospitals, State of Connecticut Department of Public Health, Third-Party Payers)
5. Utilize content experts in Connecticut (ICP's and Hospital Epidemiologists); unified press releases; television and radio interviews; unified message among all health care settings

MONTH	TOPIC	COST
April – September 2007	• Hire Marketing Firm o Create logo, message and bullet points to be used throughout the year o Develop media campaign for twelve month period • Print Materials and distribution	$7,500.00 $35,000.00
October 2007	Kick Off October 4-20, 2007	$1000.00

	Infection Control Week Announcement of collaborative, current effort in our hospitals The Importance of Hand hygiene ICP's and Epidemiologists Join Forces	
November 2007	Hand hygiene and Influenza Vaccination	$1000.00
December 2007	Hand hygiene and Respiratory Etiquette	$1000.00
January 2008	Hand hygiene and the Health Care Worker	$1000.00
February 2008	Hand hygiene and Surgical Site Infections	$1000.00
March 2008	National Patient Safety Week	$1000.00
April 2008	Hand hygiene and Antibiotic Use	$1000.00
May 2008	Hand hygiene and Skin Care	$1000.00
June 2008	Hand hygiene and Multidrug Resistant Organisms	$1000.00
July 2008	Hand hygiene and Food Borne Illness	$1000.00
August 2008	Hand hygiene and School Aged Children	$1000.00
September 2008	What will the HAI Report Means?	$1000.00
October 2008	First reports on hospital infections made public	
	TOTAL	**$54,500.00**
	Public Support	**$30,000.00**
	Private Support	**$25,500.00**