

**Department of Health & Human Services  
Office of the Assistant Secretary for Health**

# **2012 Progress Toward Eliminating Health Care-Associated Infections Meeting**

**Washington Marriott Hotel  
Washington, D.C.  
November 27, 2012**

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TABLE OF CONTENTS

List of Abbreviations .....	iv
Welcome .....	1
Opening.....	2
Introduction.....	3
Plenary I: Measuring Progress Toward Achievement of Phase One HAI Action Plan Goals:	
Acute Care Hospitals .....	5
Measuring Progress in Acute Care Hospitals: <i>Clostridium difficile</i> Hospitalizations.....	5
<i>Clostridium difficile</i> Infections (CDIs) .....	6
Invasive Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) Infections.....	7
Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) Bacteremia .....	8
Central Line–associated Bloodstream Infections (CLABSIs) .....	9
Catheter-associated Urinary Tract Infection (CAUTIs) .....	9
Surgical Site Infections (SSIs).....	10
Surgical Care Improvement Project (SCIP).....	11
Discussion Highlights .....	11
Other Discussion Points (Question and Answers).....	12
Plenary II: Measuring Progress Toward Achievement of Phase Two and Three HAI Action Plan Goals .....	13
From VAP to VAE: Establishing New Definitions for Ventilator-associated Events in Adults.....	13
Ambulatory Surgical Centers (ASCs) Workgroup Update.....	15
Increasing Flu Vaccination of Health Care Personnel Workgroup Update .....	15
End-Stage Renal Disease (ESRD) Facilities Workgroup Update.....	16
Long-term Care Facilities (LTCFs) Workgroup Update .....	17
Discussion Highlights .....	18
Other Discussion Points (Question and Answers).....	19
Breakout Sessions: Report Outs.....	20

<i>Clostridium difficile</i> Infections (CDIs) .....	20
Central Line–associated Bloodstream Infections (CLABSIs) .....	20
Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) .....	21
Catheter-associated Urinary Tract Infections (CAUTIs) .....	21
Surgical Site Infections (SSIs) / Surgical Care Improvement Project (SCIP) .....	21
Ventilator-associated Events (VAEs) .....	22
Interventions Across Settings of Care.....	23
HAI Surveillance as Patients Transition Across Care Settings and Communities .....	24
Patient and Family Caregiver Engagement.....	24
Coordination of Federal Programs.....	25
Role of the Environment in HAI Prevention .....	26
Discussion Highlights .....	27
Plenary III: The Road to Achieving the HAI Action Plan Goals .....	28
U.S. Department of Health & Human Services Agency Priority Goals .....	29
Discussion Highlights .....	30
Final Thoughts .....	31
Appendix 1: Participant Roster.....	32

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**LIST OF ABBREVIATIONS**

AHRQ	Agency for Healthcare Research and Quality
ASC	ambulatory surgical center
CAUTI	catheter-associated urinary tract infection
CDC	Centers for Disease Control and Prevention
CDI	<i>Clostridium difficile</i> infection
<i>C. difficile</i>	<i>Clostridium difficile</i>
CLABSI	central line–associated bloodstream infection
CMS	Centers for Medicare & Medicaid Services
CUSP	Comprehensive Unit-based Safety Program
EHR	electronic health record
EIP	Emerging Infection Program
EMR	electronic medical record
ESRD	end-stage renal disease
FY	fiscal year
GPRA	Government Performance and Results Act

HAI	health care-associated infection
HCP	health care provider
HCUP	AHRQ Healthcare Cost and Utilization Project
HHS	U.S. Department of Health & Human Services
ICU	intensive care unit
IHS	Indian Health Service
IVAC	infection-related ventilator-associated complication
LabID	laboratory-identified
LRTI	lower respiratory tract infection
LTC	long-term care
LTCF	long-term care facility
MDRO	multi-drug resistant organism
MRSA	methicillin-resistant <i>Staphylococcus aureus</i>
NHIS	National Health Interview Survey
NHSN	CDC National Healthcare Safety Network
NQF	National Quality Forum
OASH	HHS Office of the Assistant Secretary for Health
OSHA	Occupational Safety and Health Administration
PEEP	positive end expiratory pressure
PfP	Partnership for Patients
QIO	Quality Improvement Organization
SCIP	Surgical Care Improvement Project
SIR	standard infection ratio
SSI	surgical site infection
UTI	urinary tract infection
VAC	ventilator-associated condition
VAE	ventilator-associated events
VAP	ventilator-associated pneumonia
VBP	value-based purchasing

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### **WELCOME**

**Don Wright, M.D., M.P.H., Deputy Assistant Secretary for Health, HHS Office of the Assistant Secretary for Health**

Dr. Wright stated it is wonderful that this meeting could convene after its initial date was canceled due to Hurricane Sandy in late October 2012. Some attendees could not adjust their schedule to attend this meeting, but there is great appreciation for the perseverance of those present; it represents their commitment to the issue of eliminating health care-associated infections (HAIs) and is one reason for some success that will be reported during the meeting.

Dr. Howard Koh, the Assistant Secretary for Health, sent his greeting and regretted that he could not attend this meeting. Dr. Koh has been an advocate for the *National Action Plan to Prevent Health Care-Associated Infections: Road Map to Elimination* (HAI Action Plan) and coordinated departmental effort to reduce HAIs. The HAI Action Plan marshals resources across and beyond the federal paneling to reduce, and hopefully someday eliminate, HAIs. The HAI Action Plan also established measurable goals; improved central coordination to increase the effectiveness of the prevention efforts, research efforts, surveillance, and messaging strategies; and, most importantly, reached across the federal family and into the private/public sector to coordinate and collaborate on efforts to reduce HAIs.

The HAI Action Plan is a living document that serves as a road map across the nation to reduce HAIs. It began with acute care hospitals and has since broadened efforts into the outpatient setting where there is more work to be done. Over the last year, the HAI Action Plan has expanded into the long-term care facility (LTCF) setting.

The first plenary session will look back at the past 4 years of progress as it relates to HAI rates in the country. Over the past four years, tremendous success has been achieved. However, there has been more success in some areas like central line-associated bloodstream infections (CLABSIs), while others like *Clostridium difficile* (*C. difficile*) have been the toughest challenge. The efforts have benefited from increased surveillance systems that monitor the success, a greater utilization of the Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network

(NHSN), and collaboration with the reporting for the Centers for Medicare & Medicaid Services (CMS). Geographic-specific data has increased, so it is now known which areas and institutions have more problems, and those will be targeted. There are more resources each year, like the Partnership for Patients (PfP), hospital engagement networks (HENs), the state health departments, and the Comprehensive Unit-based Safety Program (CUSP) initiative through the Agency for Healthcare Research and Quality (AHRQ).

The HHS Secretary stated that these HAI efforts are one of the agency's foremost performance goals and Dr. Marge Cannon will address this later in the day.

The future is bright as efforts move from acute care hospitals into the outpatient setting and long-term care (LTC). The Federal Steering Committee for the Prevention of HAIs are considering other areas, like physicians' offices and injection safety, to address in the next Phase of the HAI Action Plan.

Dr. Wright reminded the audience that while it is easy to revel in the success of the reduction of HAI numbers, the guiding principle needs to be the patient and their family.

## OPENING

**Mary Brennan-Taylor, Patient Safety Advocate for the Consumer Reports Patient Project, Adjunct Faculty, Department of Family Medicine, University at Buffalo**

Mary's mother, Alice, death resulted from multiple HAIs, including a urinary tract infection (UTI), methicillin-resistant *Staphylococcus aureus* (MRSA), *C. difficile*, and vancomycin-resistant enterococci. There is great hope that this conference will help all health care providers to achieve the goals of the HAI Action Plan to prevent HAIs, so that no other innocent patients have to suffer and die like Alice. Remember that HAIs have a human face, a face ravaged by this relentless, ruthless, and, above all, preventable condition.

Alice was a unique individual who lived life to the fullest and was cherished by her family. She was healthy, lived independently, drove, and had a social schedule that would exhaust most 20-year-old adults. After being hospitalized for suspected gout, she was expected to return home stronger and dance at her high school reunion. Instead she contracted four HAIs and, like many patients of her generation and younger patients, Alice would not have asked her health care providers why certain medications were prescribed, why certain tests were ordered, and if her doctor or nurse had washed their hands or wiped off their stethoscope.

Alice went from driving her own car July 12, 2009, to dying in hospice care August 29, 2009. During Alice's journey, the family did not think that things could possibly get worse, but they did. In the middle of the cascade, Alice would ask Mary, "What is happening to me?" Mary knew what was happening, but the biggest question was, "Why?"

The first indication that Alice was suffering from an HAI occurred exactly three weeks after Alice's initial admittance to the hospital. While in a rehabilitation facility, the diagnosis of MRSA was made on August 3<sup>rd</sup>, then on August 10<sup>th</sup> a UTI was diagnosed, and on August 19<sup>th</sup>,

*C. difficile* was diagnosed and Mary was asked to sign a Do Not Resuscitate form. Five days before her death, the fourth HAI, vancomycin-resistant enterococci, was diagnosed.

Within 10 days, Alice had dropped 24 pounds. On August 29<sup>th</sup>, six weeks after it all began, Alice died.

Alice's death certificate named sepsis as the leading cause of death. This certificate propelled Mary into the patient safety movement. When reflecting upon Alice's death, the three greatest elements lacking in Alice's care were communication, transparency, and education. There was an utter lack of communication between health care providers and Alice as to what was happening to her, as well as between the hospital and rehabilitation facility. There was also virtually no change in the efforts to do any terminal cleaning once *C. difficile* was diagnosed—the only instruction given to her family was to use the hand gel outside, but that is ineffective against *C. difficile*.

Collaboration between patients, family members, doctors, nurses, and hospitals is critical to effect the necessary culture change to make patient safety a priority. Mary ended by asking the conference's participants to consider the many ideas being brought forth, ask, "Would this recommendation have been helpful in saving Alice, and the other 100,000 more innocent HAI victims like her, who will succumb to this modern day plague?"

## INTRODUCTION

**Don Wright, M.D., M.P.H., Deputy Assistant Secretary for Health, HHS Office of the Assistant Secretary for Health**

The first plenary session is going to be a look back at what targets were set and where they are now. As a result of the Government Accountability Office's report and Congressional hearings that followed, it was determined that the HAI Action Plan could not tackle all HAIs at once, so the Phase One effort was on acute care hospitals. Many folks championed other health care facilities, but, over time, they will be included in a comprehensive approach. The phases set were:

Phase One: Acute Care Hospitals

Phase Two: ambulatory surgical centers (ASC), end-stage renal disease (ESRD) facilities, and influenza vaccination of health care personnel (HCPs)

Phase Three: LTCFs

Phase IV: to be determined

From the beginning, the HAI Action Plan has been a living document, one that would be updated as the science evolved and it was determined which strategies were the most effective at reducing HAIs.

Phase One focused on acute care hospitals and the Deputy Secretary of HHS asked that not only a HAI Action Plan be established, but also some 5-year targets that benchmarked the success.

These 5-year targets will be completed in December 2013 and will be used as a comparison for future efforts. By the end of 2013, the HAI Action Plan targets are:

<u>Metric</u>	<u>National 5-year Prevention Target</u>
Central line–associated bloodstream infections (CLABSIs)	50% reduction
<i>C. difficile</i> (hospitalizations)	30% reduction
<i>C. difficile</i> infections (CDIs)	30% reduction
Catheter-associated urinary tract infections (CAUTIs)*	25% reduction
MRSA invasive infections (population)	50% reduction
MRSA bacteremia (hospital)*	25% reduction
Surgical Site Infections (SSIs)	25% reduction
Surgical Care Improvement Process (SCIP) measures	95% adherence

\*Due to data being collected at a later time, 5-year targets were extended to 2014 and 2015, for CAUTI and MRSA bacteremia, respectively.

The data from 2009 were published in 2010. It showed that the HAI Action Plan was on track to meet the 5-year targets with bloodstream infections, MRSA invasive infections, MRSA bacteremia, and SCIP. A year later, 2010's data showed more progress was made in UTIs and SSIs. *C. difficile* was the one area where progress was not yet met. Today, more data will be presented to see if the HAI Action Plan continues to be on target.

The original strategy was effective and HHS established measures to benchmark the success. These were presented in September 2010 at the last [Progress Meeting](#).

Phase Three was completed recently; its efforts will be presented in the second plenary. In April 2012, the LTCF chapter was published for public comment. LTC has a wide definition, but the focus was set on the skilled nursing facilities. This chapter highlights federal investments in regional, state, and local efforts, with emphasis on the tools used by CMS's Quality Improvement Organizations (QIOs) and (PfP).

In November 2011, the HAI Action Plan was published and opened for public comment. In June 2012, the Federal Steering Committee reviewed comments and incorporated as many as possible. In October and November 2012, the LTCF chapter was incorporated into the HAI Action Plan as Phase Three.

The one area of the HAI Action Plan that has changed is the retiring of the central-line insertion practice (CLIP) measure due to the recent declines in the HAI Action Plan national outcome measure for CLABSI and the central role of CLIP in preventing CLABSIs.

## PLENARY I: MEASURING PROGRESS TOWARD ACHIEVEMENT OF PHASE ONE HAI ACTION PLAN GOALS: ACUTE CARE HOSPITALS

### Measuring Progress in Acute Care Hospitals: *Clostridium difficile* Hospitalizations

Claudia A. Steiner, M.D., M.P.H., Research Medical Officer, Agency for Healthcare Research and Quality

AHRQ's Healthcare Cost and Utilization Project (HCUP) is a prevalence database that is collected passively. This presentation is of a much broader view of *C. difficile*, not one of primary data collection or incidents.

The 5-year HAI Action Plan's prevention target was a 30% reduction in hospitalizations with *C. difficile*. HCUP is an all-payer inpatient care database. It is a billing database passively collected from 46 states from 2010 to 2011. This includes all acute care hospitals (ACHs) from each state except the Department of Veterans Affairs, Department of Defence, and Indian Health Service (IHS) hospitals. The database includes academic medical centers and public health and specialty hospitals; it captures about 85% to 95% of the care that occurs in the United States. There were about 38 million raw discharges from about 4,800 hospitals.

HCUP produces national estimates, it stratifies all hospitals with strata that help produce about a 20% database across all of those hospitals, so it is a robust estimate of their care. Discharge weights for each stratum are calculated and applied to achieve national estimates. To pick out cases of *C. difficile*, HCUP uses the code for *C. difficile*: International Classification of Diseases, Ninth Revision (ICD-9)-CD 008.45. If this code occurs anywhere on a patient's record, that patient is counted as having *C. difficile*, but it is important to remember that this is a hospital database, not a patient database.

The baseline period was 2008 and the baseline rate was 11.6 cases per 1,000 hospitalizations. By calendar year 2010, the rate was 11.5 per 1,000 hospitalizations, so there was no significant reduction. The broad, robust database allows projections with the use of early quarterly data and some complex metric models. The projected rate for CDIs is due to increase for calendar year 2012, up to 12.9 per 1,000 hospitalizations.

Based on the state data, *C. difficile* hospitalization regional projections are possible. Looking at New England's nine census regions, the pattern was a steady increase from 2001 to 2007 (ranging from 10 to 15 *C. difficile* cases per 1,000 discharges), but then there was a flattening to just under 15 cases per 1,000 discharges from 2008 to (projected) 2012.

The West South Central Region's (comprised of Arkansas, Louisiana, Oklahoma, and Texas) rate data shows that the rates are much lower, starting at 5 cases per 1,000 discharges in 2001, and plateauing at about 10 cases per 1,000 discharges from 2005 to (projected) 2012.

AHRQ has recently collaborated with CDC staff to look at readmissions. Because the HCUP data goes down to the level of the patient, a patient can be followed across time and setting. For patients who have *C. difficile*, about 5% are readmitted because of *C. difficile* as the principal

reason, and about 10% are readmitted because of *C. difficile* during their hospitalization. The data shows that, for any patient admitted with *C. difficile*, the readmission rate is about 30% within 30 days of discharge, and 45% to 50% within 90 days.

## ***Clostridium difficile* Infections (CDIs)**

**Paul Malpiedi, M.P.H., Epidemiologist, Centers for Disease Control and Prevention**

CDC's NHSN is a secure, Web-based reporting system for HAIs. Most of the measures in the HAI Action Plan are about standardized infection ratios (SIRs). To review, the SIR is a measure that compares the number of infections reported to NHSN to the number of infections that would be predicted based on national baseline data.

$$\text{SIR} = \text{Observed number of HAIs} / \text{Predicted number of HAIs}$$

An SIR greater than one means that there are more infections than would have been predicted given the baseline data, thus an increase in that type of HAI. Conversely, an SIR of less than one means that there are fewer infections than would have been predicted given the baseline data. An SIR below one is the target.

The 5-year target was to reduce the number of hospital-onset CDIs by 30%, or an SIR of 0.70. The laboratory identified (LabID) event to report this HAI was introduced in 2008–2009, but it was not met with a groundswell of reporting. In 2010–2011 there was sufficient reporting to establish the baseline period.

The analysis comparing the 2010–2011 baseline to the very preliminary data from the first half of 2012 shows that 1,050 facilities reported and the SIR was 1.28, or a 28% increase in CDIs over baseline. There are reporting delays to the system and issues with NHSN that do not account for changes in testing practices.

The risk adjustment in the SIR calculation included:

1. The facility bed size, which was broken down into three levels: greater than 245, 101 to 245, and 100 or less.
2. Teaching type, broken down into three levels: major, graduate, and limited and nonteaching hospitals combined.
3. Type of lab CDI test, broken down into three types:
  - a. Nucleic acid amplification test (a polymerase chain reaction test). It is very sensitive and will identify more *C. difficile* compared to enzyme immunoassay or other testing methods.
  - b. Enzyme immunoassay, which is more sensitive than culture; and,
  - c. All other tests.
4. Prevalence, the number of “community onsets” coming into each facility.

CDC asks hospitals to fill out a 30-question survey. The survey is completed for a full calendar year at the beginning of the following year. The 2012 survey will not be done until March 2013; therefore, some facilities may have switched to a more sensitive testing method that identifies more *C. difficile*, but CDC will not be able to confirm what test types were used in 2012's

preliminary survey until 2013. At that time, the calculation will be adjusted for test type and the SIR calculation will be updated.

There is some lag time in NHSN reporting. These lag time issues and facility survey issues preclude CDC from having a final SIR for early 2012 *C. difficile* events.

State health departments play a unique role in coordinating HAI prevention activities in their jurisdictions. Eight state health departments are funded by CDC through the Affordable Care Act to address *C. difficile* across different care settings, and more states have indicated they want to participate in this collaboration.

## **Invasive Methicillin-resistant *Staphylococcus aureus* (MRSA) Infections**

**Paul Malpiedi, M.P.H., Epidemiologist, Centers for Disease Control and Prevention**

This data is presenting the actual incidence rate, not the SIR. The data source is CDC's Emerging Infections Program (EIP). The metric is the incidence rate per 100,000 people, the 5-year target is a 50% reduction in the incidence of HAI MRSA infections, and the baseline period is 2007-2008.

The EIP has been an active, population-based surveillance program since 2005. Thirty-two reporting counties in 9 states cover 19.2 million people. Using statistical methods, a national projection can be created of MRSA's incidence, adjusted for age, race, sex, and use of dialysis status. Surveillance officers get all positive cultures of MRSA from invasive sites, like blood, joints, or spinal fluid. Then they go through a thorough medical record review to classify the infection as community onset or health care onset. A MRSA case definition is a positive MRSA culture from a normally sterile site in the surveillance catchment resident, greater than or equal to 30 days from any prior MRSA culture.

The positive cases are broken down into three epidemiological areas, spread over two main categories, health care-associated or community-associated.

1. Health care-associated, which is split into two sub-categories:
  - a. Hospital-onset: a culture was obtained greater than three days after admission.
  - b. Health care-associated/community-onset: a culture was obtained prior to day three in the hospital and the patient has exposure to the health care system with a history of surgery, hospitalization, dialysis, or LTC in the prior 12 months, *or* there was the presence of a central venous catheter at the time of admission.
2. Community-associated: a culture obtained in the first three days of admission, with no health care exposure for the previous year.

A graph showing the national estimated incidence of MRSA infection by category (2011 versus baseline) stated:

1. Hospital-onset cases had a decrease of 42% in 2011.
2. Health care-associated/community-onset cases had a decrease of 18% in 2011.

3. All health care-associated MRSA (the overall metric in the HAI Action Plan) had a decrease of 26% (82,000 versus 62,509 cases), so the drop is on pace to meet the 5-year prevention target of a 50% reduction by 2013.

Within the 62,509 cases of “All health care-associated MRSA” patients, about 50% were discharged from acute care in the previous three months, and about 25% were outpatient dialysis patients. This suggests any accelerated prevention plan must include outpatients and the post-discharge settings.

### **Methicillin-resistant *Staphylococcus aureus* (MRSA) Bacteremia**

**Paul Malpiedi, M.P.H., Epidemiologist, Centers for Disease Control and Prevention**

CDC uses data from NHSN for another MRSA measure of MRSA bacteremia, looking only at blood cultures. Much like what was done for *C. difficile*, the metric is SIR, the 5-year target is a 25% reduction in facility-wide inpatient health care facility-onset MRSA blood LabID events (SIR = 0.75), and the baseline period is 2010–2011.

1. The hospital onset MRSA bacteremia definitions are: LabID Event – specimen collected for clinical decision making purposes from a patient having no previous similar LabID specimen in the previous 14 days (for multi-drug resistant organism (MDRO) blood and *C. difficile*).

There are no chart reviews or intensive efforts by the infection preventionist at a facility to investigate the case, and NHSN determines if it is a community or health care onset case based on the dates of admission and culture.

2. Facility-wide Inpatient – for a month, denominators of patient days and admissions are collected as the sums of all inpatient locations in the facility (for CDI, subtract counts from neonatal units).
3. Health care facility-onset – a LabID Event specimen collected greater than 3 days after admission to the facility, where admission is treated as Day 1. These are the cases that CDC is trying to reduce.

The number of facilities reporting has increased from the 2010–2011 baseline of 740 to 844 in the first half of 2012. The overall SIR was 0.952, a 5% reduction, although this is only preliminary data from the first half of 2012, which is incomplete for adjustment variables. There is a lag time in reporting.

The variables from the final model that are to be included for risk adjustment in the SIR calculation are intercept (testing type), facility bed size of less than or equal to 400 or greater than 400, a hospital’s teaching type (major teaching hospitals versus all other), and the continuous prevalence rate of community-onset MRSA cases. The test types do not change as much as they do with *C. difficile*.

## **Central Line–associated Bloodstream Infections (CLABSIs)**

**Paul Malpiedi, M.P.H., Epidemiologist, Centers for Disease Control and Prevention**

CDC uses data from NHSN to evaluate CLABSI. The metric is SIR, the 5-year target is a 50% reduction in intensive care unit (ICU) and ward-located patients (SIR = 0.50), and the baseline period is 2006-2008.

The number of facilities reporting CLABSI in 2011 jumped to 3,472 because those facilities participating in CMS's Inpatient Quality Reporting Program were also required to start reporting to NHSN the number of CLABSI cases occurring in their ICUs. All 50 states report. There is a fair variety of location types for facilities reporting on CLABSI; the number of ICU locations reporting shifted from comprising 62% at baseline to only accounting for 47% in 2011.

The overall SIRs show progress over time, going from 0.85 in 2009 to 0.68 and 0.59 in 2010 and 2011, respectively. Each SIR reduction is statistically significant, so there is excitement about the progress.

By location type, SIRs have reduced the most in ICUs with a 44% drop, but the wards have more work to be done with a 36% SIR drop.

Switching to incidence rates, there has been an overall decline in the pathogen-specific pooled mean CLABSI incidence per 1,000 central-line days (among 7 ICU types). Data for 1990–2004 came from the National Nosocomial Infection Surveillance System, and then it was collected from NHSN from 2006–2010. *S. aureus* is now half as frequent as other pathogen groups; there was a 17% annual decline in its infections. The other three bacteria types (Gram-negative rods, *Candida* species, and *Enterococcus* species) had an annual decline of 10% to 14%, suggesting further CLABSI prevention may need to incorporate strategies beyond best insertion practices.

## **Catheter-associated Urinary Tract Infection (CAUTIs)**

**Paul Malpiedi, M.P.H., Epidemiologist, Centers for Disease Control and Prevention**

CDC uses data from NHSN to evaluate CAUTI. The metric is SIR, the 5-year target is a 25% reduction in ICU and ward-located patients (SIR = 0.75), and, because of a CDC change in the definition of CAUTI in 2009, the baseline period is taken from 2009.

In preparation for the 2012 mandate that facilities report CAUTI rates to the CMS Inpatient Quality Reporting Program, 1,807 facilities reported this value to NHSN in 2011. All 50 states, plus the District of Columbia and Puerto Rico, are represented and 41% are ICU locations. In 2010, the CAUTI overall SIR was 0.94 (a 6% reduction), and in 2011 the SIR was 0.93 (a 7% reduction). These are statistically significant reductions, but the magnitudes of the reductions are not as significant as CLABSI.

The SIR change by location broke down as follows: ICUs went from an SIR of 0.97 in 2010 to 0.99 in 2011 (not statistically significant); wards went from an SIR of 0.88 in 2010 to 0.85 in 2011.

There has been an influx in the number of facilities reporting. As a result, anecdotally there is a learning curve in the reporting process to NHSN. Facilities need to get used to the reporting, and they may not be aware that there are issues of CAUTI in their ICUs until they start reporting to the system. This may explain why there is not a major reduction in CAUTI SIR from 2010 to 2011. Conversely, states that have been reporting CAUTI for a long time and that have intense prevention efforts, like Michigan, have greater SIR reductions. Looking at the early 2012 data, there is evidence that facilities who have reported for the past 3 years have rates and SIRs that are going down faster than those facilities that are just starting to report CAUTI. There is more work to be done with CAUTI reduction efforts.

## **Surgical Site Infections (SSIs)**

**Paul Malpiedi, M.P.H., Epidemiologist, Centers for Disease Control and Prevention**

CDC uses data from NHSN to evaluate SSIs. The metric is SIR, the 5-year target is a 25% reduction ( $SIR = 0.75$ ) in SSIs following SCIP-like procedures (the 10 procedures in NHSN reporting that closely mimic the SCIP procedures) on admission or readmission. The baseline period for SSI reporting is 2006–2008.

During the baseline period, 801 facilities were reporting SSI; in 2011, that number had risen to 2,130 facilities reporting. This jump in the number of reporting facilities is likely due to the 2012 requirement for reporting of SSIs after colon procedures and abdominal hysterectomy procedures to the CMS Inpatient Quality Reporting Program. Again, there was a nice trend in the direction of SSIs. In 2010, the SIR was 0.92 (an 8% reduction); in 2011, the SIR was 0.83 (a 17% reduction). Both years' SIR reductions were statistically significant.

CDC puts together a national annual report that summarizes SIR data. That report notes prevention successes have varied by procedure type. Almost all SIRs for SSI procedures are statistically significant, with the highest reductions in cardiac procedures (e.g., coronary bypass graphing). There have been slightly higher SIRs (lower reductions) in arthroplasty and hysterectomy procedures.

State health departments play an important role in HAI prevention. The state-based infrastructure that CDC built through the American Recovery and Reinvestment Act of 2009 and Affordable Care Act funding is invaluable. Some of that funding went toward Tennessee's Department of Health following the 2012 fungal meningitis outbreak. CDC is also collaborating within states across the continuum of care.

NHSN's data enables CDC to follow up with over-performing and underperforming facilities, to see how CDC can assist them. CDC is not the only organization using the NHSN data. This data is also used in CMS facilities, for state and national reports, and by health departments, quality improvement groups, and other collaborative (e.g., CUSP) and research groups.

## **Surgical Care Improvement Project (SCIP)**

**James (Jim) Poyer, M.S., M.B.A., Director, Centers for Medicare & Medicaid Services**

This presentation provides an update on the national progress for the SCIP measures during fiscal year (FY) 2008 to 2011. The five process of care measures include:

1. SCIP Infection 1: Antibiotics within 1 hour before incision (3Q2006)
2. SCIP Infection 2: Received prophylactic antibiotics consistent with recommendations (1Q2007)
3. SCIP Infection 3: Prophylactic antibiotics discontinued within 24 hours of surgery end time (3Q2006)
4. SCIP Infection 4: Controlled 6:00 a.m. postoperative serum glucose after cardiac surgery (1Q2008)
5. SCIP Infection 6: Appropriate hair removal (1Q2008)

These care measures are not risk adjusted and are reported to the CMS quality improvement clinical warehouse by more than 3,000 hospitals. The national target is 95% adherence and, for Fiscal Year 2011, all five measures met that target. In fact, all measures except SCIP Infection 4 are at 98% adherence or above.

SCIP Infection 1, 2, 3, and 4 measures are part of CMS's Hospital Value-Based Purchasing (VBP) program that began with July 1, 2011, discharges. These results show progress in reporting and linking payment to performance. The first incentive payments to hospitals will begin in January 2013.

CMS's QIOs continue to provide SCIP assistance to hospitals on measures, including Hospital VBP.

The measure for SCIP Infection 6 (appropriate hair removal) was suspended and placed in reserve status, effective January 1, 2012, due to its topped-out status, being close to 100% with no variation among hospitals.

For the SCIP Infection 4 measure, the National Quality Forum made a modification to the numerator inclusion. The process of care changed the time when a serum glucose level should be checked; it changed from 6:00 a.m. to within 18 to 24 hours following surgery, depending on the type of surgery.

## **Discussion Highlights**

1. AHRQ's HCUP is a prevalence database that is collected passively. This presentation is of a much broader view of *C. difficile*, not one of a primary data collection or incident.
  - a. The calendar year 2012 *C. difficile* projected rate is due to increase to 12.9 per 1,000 hospitalizations, up from calendar year 2011's projected rate of 11.9 per 1,000 hospitalizations.

2. To compare the number of infections reported in NHSN to national baseline data, CDC often uses the SIR metric:  $SIR = \text{Observed number of HAIs} / \text{Predicted number of HAIs}$ .
3. The most recent SIR data (either 2011 or the first half of 2012) were as follows:
  - a. *C. difficile* SIR is 1.28 (28% increase)
  - b. Hospital-onset MRSA Bacteremia SIR is 0.952 (5% reduction)
  - c. CLABSI SIR is 0.59 (41% reduction)
  - d. CAUTI SIR is 0.93 (7% reduction)
  - e. SSI SIR is 0.83 (17% reduction)
4. MRSA infections have decreased 26% from the 2007–2008 baseline.
5. As of FY2011, all five SCIP measures have met or exceeded the national target of 95%.

#### **Other Discussion Points (Question and Answers)**

1. The CDI HCUP report of data is available on the AHRQ.gov website under the HCUP/new projections report. State permission to provide state data is under review. Readmission data is also forthcoming.
2. Will CDC consider redefining the national benchmark? The vast majority of hospitals are below an SIR of 1.00, but this may be confusing to the consumer. Response: Some fairly significant modifications to NHSN definitions will be forthcoming in 2013.
3. Consumer sites should have fully transparent explanations for risk adjustment. Response: CDC's risk adjustment for medical schools is only done when it renders statistically significant differences in risk.
4. There is concern about the tremendous changes in the number of reporting facilities and if CDC can appropriately perform risk adjustment for this change. Response: CDC looks at continual reporting facilities to account for differences from new facilities reporting.
5. One readmission loophole that has been seen is hospitals holding patients in observation for 23 hours instead of readmitting them for a HAI. Response: States are aware of this and try to collect this data.
6. Has there been an effort to correlate the CDI rate with antibiotic prescriptions to check if there is appropriate antimicrobial stewardship in place? Response: Linking pharmaceutical billing data to CDIs is difficult. CDC has rolled out their antimicrobial model, so more data may come in for that.
7. Can the federal agencies harmonize measures addressing some overlap in the definitions of hospital-acquired condition and HAIs? Response: The hospital-acquired condition measure is mandated, so it cannot change.

## **PLENARY II: MEASURING PROGRESS TOWARD ACHIEVEMENT OF PHASE TWO AND THREE HAI ACTION PLAN GOALS**

### **Moderator**

**Rani Jeeva, Team Leader for Health Care-Associated Infection Prevention, Office of the Assistant Secretary for Health**

The second plenary session will focus on the HAI Action Plan measures for Phase Two and Three, and a new approach for defining ventilator-associated events (VAE). These measures and goals are less established than those in Phase One; they are in various states of widespread acceptance or limitation, and most do not have associated baseline measurements.

VAE pneumonia was the only priority area of Phase One where, at a 2008 meeting similar to this one, subject matter experts could not come to a consensus on a definition and 5-year reduction goal for national use in the HAI Action Plan. At the 2010 meeting, a special session was held regarding this definition.

### **From VAP to VAE: Establishing New Definitions for Ventilator-associated Events in Adults**

**Suhail Raof, M.D., New York Methodist Hospital, on behalf of the Critical Care Societies Collaborative**

Several complications are associated with mechanical ventilation, including ventilator-associated pneumonia (VAP), and additional events that can all prolong the duration of mechanical ventilation. In the past, the definition of VAP looked at the infection complications associated with VAP. A more accurate definition was needed because the first one was inaccurate and labor intensive. Additionally, if there was to be more public reporting of HAI rates, comparisons among facilities, and pay-for-performance programs, a better definition of VAP was needed.

The incidence rate of VAP has been declining. Possible reasons for this include the etiquette of elevating the head of the bed, improving oral hygiene and suctioning techniques, or reporting of VAP by HCPs. If an HCP uses the stringent interpretation of the signs of VAP and those are not fulfilled, VAP will not be diagnosed. Sometimes hospitals will call VAP something else, like trachitis.

The goals for modifying current definitions were to achieve validity, clinical credibility, and improve reliability, thereby reducing the burden. The group charged with these goals reviewed the CDC's draft, suggested modifications that would enhance the reliability and credibility within the critical care community, and then proposed a new adult definition, excluding children. The new definition uses an algorithm that could use electronic medical records (EMRs) for easier data extraction, which would also be meaningful for public reporting, pay for performance measures, and inter-facility comparisons.

The new VAE surveillance definition algorithm is a three-tiered approach for patients 18 years of age or older who are inpatients of acute care hospitals, long-term ACHs, and rehabilitation facilities. Excluded from the VAE surveillance are patients on high frequency ventilation or extracorporeal life support.

Of the three tiers, Tiers 1 and 2 are definitions suitable for potential use in public reporting, while Tier 3 is suitable for internal use definitions. This system now intentionally identifies a broad range of complications and conditions in mechanically ventilated patients, going beyond infections. It is not a clinical definition algorithm and is not intended for use in the management of patients. The VAE definition summary is provided in the following table. The new VAE approach will be available to NHSN in January 2013, but the current VAP protocol will still be used for neonatal and pediatric patients only.

Tier	Criteria and <b>Diagnosis (in bold)</b>	Patient's conditions
Respiratory status component (Tier 1)	Stabilized patient on mechanical ventilation $\geq 2$ days, AND	
	Baseline period of stability or improvement, followed by sustained period of worsening oxygenation, sustained over $\geq 2$ calendar days	$FiO_2 \geq 0.20$ over baseline period OR positive end expiratory pressure (PEEP) $\geq 3$ cm H <sub>2</sub> O
Infection / inflammation component (Tier 2)	<b>Ventilator-associated condition (VAC)</b> Note: a chest x-ray is not required to diagnose VAC	
	Patient meets criteria for VAC, AND on or after calendar day 3 of ventilation and within 2 calendar days before or after the onset of worsening oxygenation, a general evidence of infection/inflammation.	BOTH a temperature $> 38^\circ\text{C}$ or $< 36^\circ\text{C}$ , OR white blood count $\geq 12,000$ cells/mm <sup>3</sup> OR $\leq 4,000$ cells/mm <sup>3</sup> , AND new antimicrobial agent $> 4$ calendar days
	<b>Infection-Related Ventilator-Associated Complication (IVAC)</b>	
Additional evidence (Tier 3)	Patient meets criteria for VAC and IVAC, AND on or after calendar day 3 of mech. Ventilation and within 2 calendar days before or after the onset of worsening oxygenation	ONE of following criteria: Purulent secretions from lungs, bronchi, or trachea that contain $\geq 25$ neutrophils and $\leq 10$ squamous epithelial cells / low power field, AND/OR other positive culture of sputum, endotracheal aspirate, bronchoalveolar lavage, lung tissue, or protected specimen brushing
	<b>Possible (less certain) or Probable (more certain) VAP</b> - Having both purulent secretions and a positive culture, a Probable diagnosis is made	

## **Ambulatory Surgical Centers (ASCs) Workgroup Update**

**Amber Taylor, M.P.H., Health Policy Analyst, Office of the Assistant Secretary for Health**

Currently, there are more than 5,300 ASCs certified for Medicare participation, a 54% increase since 2001. They vary in size, staffing, ownership, and use of paper or electronic records.

The ASC Chapter was developed by CMS, CDC, AHRQ, and IHS. The chapter is part of the HAI Action Plan, initially released in September 2010, after several meetings to develop data and guidelines for ASCs.

The ASC Action Plan falls into three main categories to address unmet needs pertaining to HAI prevention:

1. Proactively prevent HAIs at the clinic level.
2. Sustain and expand improvements in oversight and monitoring.
3. Develop meaningful HAI surveillance and reporting procedures.

By December 31, 2013, HHS and stakeholders will:

- 1-1. Develop plan for ongoing collection, electronic transmission, and analysis of process measure data that are collected using the Infection Control Worksheet as part of ASC inspections
- 2-1. Identify existing quality measures (e.g., serious reportable events, SCIP measures) that have been NQF-endorsed and are applicable to ASCs;
- 2-2. Identify areas where additional quality measures are needed for ASCs; and,
- 2-3. Establish a timeline and methods for adoption and implementation of select measures within ASCs.
- 3-1. Identify a set of ASC procedures for which HAI definitions and methods should be developed; and,
- 3-2. Establish a multi-year plan and phased approach to support their routine surveillance in a resource-efficient manner that can be implemented consistently across facility types; and,
- 3-3. Identify requirements and standards for ASCs to report notifiable diseases and potential outbreaks.

## **Increasing Flu Vaccination of Health Care Personnel Workgroup Update**

**Jennifer Gordon, Ph.D., Consultant, Office of the Assistant Secretary for Health**

Influenza vaccination is important for HCPs because they are at risk for occupational exposure to influenza, and they have contact with vulnerable patients. Prevention of HAIs requires ongoing adherence to prevention strategies that optimize protection of both patients and HCPs.

An influenza comprehensive prevention plan includes vaccination and other actions, like hand/cough etiquette, screening/isolation of ill patients, and appropriate management of ill HCPs. Sometimes HCPs continue to work without being aware that they have influenza, exposing patients and co-workers to the virus. Several studies indicate that vaccinating HCPs has a protective effect for patients, in particular in LTCFs, but more data is needed.

Influenza vaccination of HCPs is a priority; the Healthy People goals were 60% in HP2010 (goal achieved) and 90% in HP2020. The HAI Action Plan interim 2015 goal is 75% annual coverage. Since 1996, there has been a steady increase in the percentage of vaccinated HCPs, with the rate being 67% for the 2011–2012 season.

Strategies may need to be tailored to address different work settings and occupations. Hospitals have the most vaccinated HCPs at 76.9%. LTCFs have the least at 52.4%. Physicians are the most vaccinated group at 85.6%, with other HCPs (like dental offices and nonhospital laboratories) at 62.8%.

Evidence-based strategies that help improve HCP vaccination rates include strong leadership and commitment, education and campaigns for HCPs and patients, improved access, measurement and feedback, and mandatory policies.

NQF Measure #0431 has been used to measure vaccination progress. The CDC-sponsored measure uses standardized methodology for reporting within a single facility and for comparison across facilities, and it includes HCPs working in the health care facility for at least 30 working days (October 1–March 31). It looks at employees, licensed independent practitioners, adult students and trainees, and volunteers. It does not include contract staff, but facilities are encouraged to follow this group of people who should also be vaccinated. The data collection starts January 1, 2013, through NHSN; facilities that fail to report the data will incur a 2% reduction in the annual payment increase from CMS. Data from the 2013–2014 season will be available at [www.hospitalcompare.hhs.gov](http://www.hospitalcompare.hhs.gov).

HHS will continue to enhance interagency collaborations, engage stakeholders, improve and synthesize tools to improve HCP vaccination rates, and implement measures and standards for the influenza vaccination of HCPs.

## **End-Stage Renal Disease (ESRD) Facilities Workgroup Update**

**Amber Taylor, M.P.H., Health Policy Analyst, Office of the Assistant Secretary for Health**

The priorities for ESRD patients are the prevention of intravascular infection, bloodborne pathogen transmission, and influenza and pneumococcal disease. Additional priorities are to implement priority bundles, education, and training.

Some 5-year national metrics and evaluation targets include:

1. Greater than 90% seasonal influenza and hepatitis B vaccination for ESRD patients.
2. Greater than 90% facilities reporting to NHSN.
3. Less than 20% (preferably 0%) use of central venous catheter use in patients on hemodialysis.
4. Greater than 70% screening for the hepatitis C antibody.

Some state- and federal-level challenges include enhancing communications and collaborations between state survey agencies and ESRD networks, especially concerning outbreak responses. Facility provider–level challenges include transitions of care, prophylactic antibiotic use, and data reporting. Patient-level challenges include increasing patient involvement and encouraging them to speak up if they see something wrong.

The future direction of this workgroup is to look at antimicrobial resistance, prevention through access care, viral hepatitis epidemiology, and the role of the environment. The group also wants to review how to engineer solutions and processes, look at new medications and devices, and expand the Emerging Infections Program.

## **Long-Term Care Facilities (LTCFs) Workgroup Update**

**Deb Nichols, M.D., M.P.H., Public Health Advisor, Office of the Assistant Secretary for Health**

The LTCFs working group was created in 2011 and has put forth a LTCF Chapter for the HAI Action Plan. The chapter is limited to nursing and skilled nursing facilities, collectively known as nursing homes.

The burden estimate of HAIs is 765,000 to 2.8 million infections per year. After a literature search, these five priority areas were found to be burdensome, but they were associated with known prevention measures that work:

1. NHSN enrollment (metric with target). Data collection is a major priority.
2. CDIs
3. Resident influenza and pneumococcal vaccination (metric with target)
4. HCP influenza vaccination (metric with target)
5. UTIs

NHSN Enrollment = the number of certified nursing homes enrolled in the NHSN LTCF Component / the number of nursing homes in the U.S. (with a baseline of no currently enrolled homes)

The goal of this metric is for 5% of certified nursing homes (currently at 15,735) to enroll in NHSN over the next 5 years following the recently launched component. There has been feedback that this is too low of a goal, but currently LTCFs do not have the incentives to participate in NHSN that other groups have experienced for the past several years.

Lower respiratory tract infections (LRTI) are a leading cause of hospitalization and death in adults older than 65 years. Influenza and bacterial pneumonia are part of the LRTI issue, but they are preventable. Nursing facilities involve communal living, so there is also the issue of contagion.

Greater resident vaccination coverage for influenza has been shown to reduce hospital-associated influenza and influenza-related mortality. Pneumococcal vaccination has also been shown to reduce bacteremia and death from *Streptococcus pneumoniae* in the elderly. The goal is 85% for vaccination coverage, within 5 years, of eligible residents for both seasonal influenza and pneumococcus. According to CMS's Minimum Data Set 3.0, the baseline for residents receiving an influenza vaccination is 81.7% for long-stay residents and 60.1% for short-stay residents. The baseline for residents receiving a pneumococcal vaccination is 79.8% for long-stay residents and 61.2% for short-stay residents.

According to the National Health Interview Survey (NHIS), the baseline is 36.2% for the influenza vaccination of HCPs working in LTC. Preliminary data (non-NHIS) for the 2010–2011 season is 64.4% HCP coverage. The goal for 2015 is 75% coverage of HCPs in LTC.

The metrics without targets are CDIs, UTIs, CAUTIs, and catheter care processes. For CDIs, the metric is the incident of nursing home–onset CDI LabID events per 10,000 resident days. A nursing home–onset CDI is considered if there are no previous positive or prior positive after 8 weeks and those events have occurred more than 3 calendar days after a resident has been admitted. There is no current established national baseline. The goal is a pilot implementation of reporting to NHSN, then evaluation of variability in measure, and establishment of consensus on a measurable 5-year target.

UTIs are the most frequently reported and treated HAIs in LTC, although CAUTI events comprise a smaller proportion of all UTI events diagnosed in LTC. The metric for non-catheter-associated symptomatic UTIs is non-catheter-associated symptomatic UTIs per 1,000 resident days.

The same equation will be used for CAUTIs. The goal is to pilot reporting of these events to NHSN, evaluate variability, and obtain consensus on measurable 5-year targets.

The final version of the NHSN document will be released to the public as soon as it is approved. The next step is education because nursing homes do not have the same dedicated infection prevention personnel that other phases have in the HAI Action Plan. More research is needed across the LTC spectrum, and antibiotic stewardship is also a major priority.

## **Discussion Highlights**

1. The new VAE surveillance definition algorithm is a three-tiered approach for patients 18 years of age or older who are inpatients of ACHs, long-term ACHs, and rehabilitation facilities. This system now intentionally identifies a broad range of complications and conditions in mechanically ventilated patients, going beyond infections.
2. The new VAE approach will be available to NHSN in January 2013, but the current VAP protocol will still be used for neonatal and pediatric patients only.
3. The ASC Chapter was formed by CMS, CDC, AHRQ, and IHS. By the end of 2013, this chapter plans to:
  - a. Develop a plan for ongoing data collection.
  - b. Identify existing quality measures that have been NQF endorsed and can be used by ASCs.
  - c. Identify ASC procedures for which HAI surveillance definition and methods should be developed.
4. Influenza vaccination is important for HCPs because they are at risk for occupational exposure to influenza, and they have contact with vulnerable patients. To encourage HCP vaccinations, strategies may need to be tailored to address different work settings and occupations.

5. Evidence-based strategies that help improve HCP vaccination rates include strong leadership and commitment, education and campaigns for HCPs and patients, improved access, measurement and feedback, and mandatory policies.
6. Beginning January 1, 2013, if facilities do not report HCP vaccinations to NHSN, they will incur a 2% reduction in the annual payment increase from CMS.
7. Some 5-year national metrics and evaluation targets for the ESRD Facilities Workgroup include:
  - a. Greater than 90% seasonal influenza and hepatitis B vaccination for ESRD patients.
  - b. Greater than 90% facilities reporting to NHSN.
  - c. Less than 20% (preferably 0%) use of central venous catheter use in patients on hemodialysis.
  - d. Greater than 70% screening for the hepatitis C antibody.
8. The LTCF Workgroup is new and plans to address the reduction of HAIs in nursing homes by focusing on:
  - a. NHSN Enrollment (metric with target). Data collection is a major priority.
  - b. CDIs
  - c. Resident influenza and pneumococcal vaccination (metric with target)
  - d. Health care personnel influenza vaccination (metric with target)
  - e. UTIs
9. The final version of the LTCF Workgroup's NHSN document will be released to the public as soon as it is approved; the next step is educating nursing homes about the LTCF Chapter.

#### **Other Discussion Points (Question and Answers)**

1. A suggestion was made that ESRD patients be provided an alternative way to speak up, like an adverse reporting line.
2. In Pennsylvania, the Occupational Safety and Health Administration (OSHA) has made statements that it is unproven if influenza vaccinations help HCPs. It is hard when one arm of federal government is pushing for vaccination and another arm is saying there is no proof that it works. How can this be dealt with? Response: OSHA does support voluntary vaccinations, but notes that current data is insufficient to set a mandated policy. HHS will wait to see if voluntary programs work and then revisit the issue. Vaccinations are still the best way to protect the HCP and patient.
3. The 5% of LTCFs reporting to NHSN is too low and sends a message that the workgroup is not really serious about this; please reconsider this goal, perhaps making it 30% over 5 years. Response: Good point, but nursing homes are starting out at zero reporting and they do not have the same mandates to join NHSN as ACHs. This group needs to be careful to not set too ambitious of a goal.
4. What is the plan to analyze and present NHSN hemodialysis module data? Response: CDC is working with CMS to determine how reporting will be presented.

## **BREAKOUT SESSIONS: REPORT OUTS**

### ***Clostridium difficile* Infections (CDIs)**

**Edward Septimus, M.D., Medical Director, Infection Prevention and Epidemiology, Hospital Corporation of America**

As mentioned previously, the effort to reduce CDIs has not led to significant reductions. The group came up with ideas as to why this may be, and some recommendations to improve results.

The *C. difficile* issue has many moving parts: environmental, hand hygiene, and the physician's role (e.g., their prescription pen) in antimicrobial stewardship, but there is presently no benchmarking in this area. There is also a translational gap between what really works in an epidemic situation and what works in endemic, sporadic situations.

The antimicrobial stewardship issue with CDI will need to be addressed across the continuum of care, including nursing homes, skilled nursing facilities, long-term acute care facilities, acute care facilities, and physician offices. Nursing homes and skilled nursing facilities may not have sufficient training in CDI prevention, and better strategies are needed for the personal role of a nursing home patient who has had recurring CDI. Perhaps antimicrobial stewardship should be a condition for participation in increasing accountability; rates could be dependent on a testing methodology.

Routine cleaning may not be adequate in most hospitals. The idea of empowering the environmental services groups was discussed, such that these groups feel that they play a large role in patients' safety, not just in cleaning rooms. Perhaps there could be a role for no touch technologies and Cooper, a coating on high touch areas that has been shown to decrease environmental contaminations, effective over a long period of time.

### **Central Line–associated Bloodstream Infection (CLABSI)**

**Jim Battles, Ph.D., Social Science Analyst, Agency for Healthcare Research Quality**

The reduction of CLABSI has been a major success. The small group discussed how the medical community should move forward from this success. The early-to-late majority adopters have realized CLABSI safety, so now the focus needs to be on how to get the “late-late majority and laggards” on board, and perhaps the federal QIOs can do this. Surveillance could be used to help these low-performers, and for maintaining sustainability to avoid backslide due to complacency.

Lessons learned from CLABSI's success can be applied to other HAIs and to the low-performing areas.

## **Methicillin-resistant *Staphylococcus aureus* (MRSA)**

**Kevin Kavanagh, M.D., M.S., Board Chairman, Health Watch USA**

MRSA is both a community and hospital problem. The leadership to address this epidemic is likely the hospital or various health departments, but not necessarily the acute care facility. Better data is needed, for instance, with carrier rates in the general population of the community. More surveillance (e.g., intake forms that ask about a history of MRSA) should be a Tier 1 recommendation, except for low-risk populations.

There needs to be a numeric definition of what constitutes an outbreak. The current definition is “above baseline,” but this is too vague.

Proper staffing of trained personnel is needed to address this epidemic. More specific guidelines, and a prioritization of these guidelines, are needed.

The group recommended considering changes to CMS Conditions of Participation, certification, and enforcement, such as more explicit infection control measures as a certificate of need, and improved documentation on how surgical procedure follow-up for infections is performed.

## **Catheter-associated Urinary Tract Infections (CAUTIs)**

No report out or notes were collected for this topic.

## **Surgical Site Infections (SSIs) / Surgical Care Improvement Project (SCIP)**

**Nancy Sonnenfeld, Health Statistician, Centers for Medicare and Medicaid Services**

The SSI group looked at five major buckets, not necessarily presented in the order of their importance. Even while surgical process of care measures have improved and topped-out, the gains in terms of outcomes of SSIs themselves have been modest.

1. More research is needed to develop evidence-based guidelines for prevention, specific to one or a group of like procedures. The prevention guidelines should be global, across all or most procedures, and should address surgical volume-outcome relationships. More research is also needed to develop systems for dissemination of new or existing guidelines, and to develop measurements and feedback for new or existing guidelines.
2. Advocacy is needed for strong leadership and the dissemination of best practices and guidance development. This could be done through public and private partnerships, including surgical specialty and general membership organizations, as well as nursing and physician groups.
3. Within the inpatient setting, there is a need to expand the number of procedures, outcomes, and risk factors measured. The group recommended balancing the burden with data needs and improving risk adjustment. For example, the Measure Applications Partnership developed guidelines for defining diabetes for reporting clinical quality. The focus should be on high-risk procedures and medium-risk procedures with high volumes.

4. There is a real need to expand the focus of reporting to outpatient settings. The risk in this setting is not known, and priorities need to be identified for reporting. One possibility is a claims-based approach to many outpatient surgeries with readmission and claims.
5. There was a discussion to consider changes to CMS conditions of participation, certification, and enforcement. Perhaps value-based purchasing at ASCs could involve surgical complications.

### **Ventilator-associated Events (VAEs)**

**Suhail Raof, M.D., New York Methodist Hospital, on behalf of the Critical Care Societies Collaborative**

The issue of VAE HAIs is different from the other groups because of the new surveillance definition for VAEs, so there is no track record. There is a significant amount of discomfort among clinicians who are not aware of the new paradigm, so the feeling was that education and acceptance is needed to seek buy-in of the medical professionals. Outreach would be needed for intensivists, hospitalists, infectious disease doctors, infection control nurses, and respiratory therapists because all of these groups will eventually have a role in surveillance and taking appropriate measures to prevent VAEs. One way to achieve this would be to reach out to the professional societies of these groups and ask for their feedback about the surveillance, so that they feel as though they are a part of it. Another suggestion is to develop modules for training and education and to disseminate the “frequently asked questions.”

The message should address the concerns of health care professionals about this new definition, and consider including in this message:

1. The surveillance definition is not intended to be used for clinical decision making.
2. VAE is not confined to pulmonary infections. Seemingly unconnected diagnoses are lumped together. While the etiologies that this surveillance definition lumps together are very diverse, they can all lead to worsening gas exchange. Whatever the etiology of this worsening, it appears to be associated with increasing length of stay on the ventilator and in the ICU, and negatively impacts survivability. Many of these etiologies are preventable.

Seek input from stakeholders on how this surveillance definition should be used. One way, articulated by the group, was to prepare a checklist that hospitals would implement soon after a patient gets intubated. This checklist is predicated on preventing the most common conditions that are seen in intubated and mechanically ventilated patients. For instance, to prevent:

1. VAPs: head of bed elevation, use suctioning technique, special endotracheal-tubes, earlier removal from mechanical ventilation and extubation, etc.
2. Pulmonary embolism: deep venous thrombosis prophylaxis, early mobilization of patients
3. Ventilator-induced lung injury: ventilator strategies of low tidal volume-low stretch
4. Atelectasis: vent strategies using adequate positive end expiratory pressure (PEEP)
5. Acquired respiratory distress syndrome: limit blood transfusions, low tidal volumes in those at risk

If hospitals institute these types of checklists, surveillance data could be collected and hospitals will get to know if their VAC rate is high, and if they need to take remedial measures.

Many recommendations have been based on expert opinions, making certain assumptions, but further testing and validation of data is imperative. Some of these assumptions include:

1. A 0.20 FiO<sub>2</sub> (fraction of inspired oxygen) or 3 cm PEEP increase is significant.
2. A period of 2 days is considered adequate to judge patient stability.
3. High frequency oscillators and extracorporeal cardiopulmonary life support were excluded from definition, whereas airway pressure release ventilation, nitrogen oxide, and prone position were included.
4. The definition of probable or possible VAP is made without chest x-ray review.
5. Irrespective of the etiology of worsening oxygenation, the end result is worsening gas exchange. Did this consistently result in a prolonged duration of mechanical ventilation and length of stay?
6. Abstraction of data necessary for surveillance definition will be made easily through electronic medical records.

Once validation studies are performed, and surveillance data is collected, a target VAC rate may be determined in the foreseeable future.

## **Interventions Across Settings of Care**

**A.C. (Anne-Carol) Burke, M.A., HAI Program Manager, Florida Department of Health**

Seven different components or interventions were discussed that could be part of programs implemented across care settings. Not necessarily in a hierarchical order, the seven topics were:

1. Leadership and transparency
2. Family engagement
3. Maintaining the role of QIOs and state health departments in bringing a continuum of care together, being a neutral ground to bring together the different health care types for collaboration and initiatives
4. Best practice tools for LTC and other entities across the continuum of care, like translating the CUSP initiative successes over to the LTC setting. One transferrable example would be the [TeamSTEPPS®](#) model.
5. Standardize education across the continuum of care. Sometimes education resources are not the same at different health care organizations, so standardized education is needed for all of them. Examples include in-home health, catheter maintenance, and circuit riding infection control training in rural areas.
6. Using EMRs and technology to share information across the continuum of care. There is a need to ensure that meaningful information is gathered, to avoid “garbage in / garbage out.”
7. Partnerships are important for bringing the continuum of care together and implementing programs and interventions. Partnerships’ synergy can engage more facilities.

## **HAI Surveillance as Patients Transition Across Care Settings and Communities**

**Lilly Kan, M.P.H., Senior Program Analyst, National Association of County and City Health Officials**

There are three main things that need to happen to conduct HAI surveillance, recognizing that there are substantial challenges for them to happen.

1. Increasing the awareness among all care settings and communities about the burden of HAIs within their area, perhaps through increased surveillance.
2. Building a more common platform of communication and information sharing. For instance, common or standardized patient transfer forms and improved EHRs that allow all settings to access the same patient information. The aim would be to promote a culture of information sharing and access, and “making a connection.”
3. Using partnerships in advance of HAI cases, and sharing examples and “how to’s” of entities that have made progress in this area.

## **Patient and Family Caregiver Engagement**

**Janiene Bohannon, Associate Director, Association for Professionals in Infection Control and Epidemiology**

The first discussion surrounded the importance of HCPs being aware of health literacy. The definition of health literacy (Healthy People, 2010) is the degree to which individuals can obtain, process, understand, and communicate about health-related information needed to make informed health decisions. The aspects involved in health literacy are sociocultural, socioeconomic, educational levels, emotional states, and familial/social support systems. HCPs should be aware of all of these aspects when engaging patients.

It is impossible to empower patients if one cannot empower other health care team members like nurses. If nurses do not feel comfortable, due to the hierarchical chain, to speak up about poor hand hygiene, patients will likewise feel uncomfortable about it.

The entire health care team should be integrated into grand rounds, like nurses and other supporting care providers. There needs to be a culture change surrounding infection prevention care, from the top on down.

There is a need to engage patients in the health care team, to empower the patient. This could improve treatment adherence and may impact antimicrobial stewardship. HCPs should help consumers know what resources to access. Patients should be included in committees within health care facilities, like on a signage committee.

Having family present is important; visiting hours should be eliminated so that family can be part of the health care team. This will build trust. If a poor diagnosis needs to be communicated, it is helpful to have a family member present so that they can help a patient process the diagnosis.

It is also important to start early health communications training with residents and fellows. The American College of Chest Physicians has a DVD tool that helps in communications with critically ill patients and their families.

## **Coordination of Federal Programs**

**Jennifer Gordon, Ph.D., Consultant, Office of the Assistant Secretary for Health**

This group reviewed the areas of achievement, areas of opportunity, and consequences of coordination within the federal government.

### Achievements

Coordination is hard work at all levels. A positive achievement has been the government agencies and community stakeholders working together under the PfP movement. The use of CDC for national reporting has improved coordination across federal agencies. Standardizing definitions across agencies and agreeing on priorities for HAIs is an achievement. Lastly, having the HAI Action Plan focus on activities through dedicated working groups to brainstorm different areas has been an achievement.

### Areas for Opportunity

There is a need to better communicate that leadership in the HAI elimination effort exists, led by the Office of Disease Prevention and Health Promotion. The HAI Action Plan could be leveraged to provide a searchable, public list of the federal goals and activities. Streamlining the contracting process could remove barriers for federal agencies to work together. Common EHRs could help transmit quality information among federal agencies. The austere economic climate highlights the fact that federal agencies need to better leverage their unique contributions. It would be beneficial for Congress to enact a central data sharing repository for easier data sharing among agencies.

### Consequences

Poor coordination of efforts harms patients and can overwhelm state and local programs that are asked to report different measures in different places, which could lead to underreporting. Further barriers may be seen if federal resources are not available to support coordination. The enactment of the Affordable Care Act may slow federal efforts.

## **Coordination of Federal Programs, continued**

**Noel Eldridge, Public Health Analyst, Center for Quality Improvement and Patient Safety, Agency for Healthcare Research and Quality**

NHSN has evolved over time to be the national standard to measure HAIs, but one person mentioned that this could potentially cut off measuring HAIs that were not on the official CMS list of required diseases. Some states were previously doing more than NHSN, like California, which is currently looking at 29 different types of SSIs.

Some folks would like a hospital infection report rather than units. Another challenge is translating the data for consumers.

There was some confusion among many different projects, such as HENs, states, and Medicare HAI reporting via NHSN. HENs and QIOs seem to be doing the same thing, which is good in the role of the HAI Action Plan, but there is potential for more coordination efforts. Dueling groups may compete for recruiting people into their projects, which seems inefficient.

There is also a potential for getting more information from other collaboratives that fly under the radar of data acquisition, like “left out” hospitals. A “Collaboratives” list would be helpful.

The Department of Defense and Department of Agriculture are examples for changing practices across a large number of locations and organizations.

How to join information from different projects was discussed. How could information be combined? The group considered if there is a need for a national patient safety agency, such as a national officer at the state departments of health, to coordinate HAI activities. Some states have this in place.

There is no detailed insight as to which hospitals have improved. It would be appropriate to hear from the different projects that are trying to reduce many HAIs, not just hear SIR results at the end.

### **Role of the Environment in HAI Prevention**

**Steve Kralovic, M.D., M.P.H., Medical Epidemiologist, Veterans Health Administration**

In general, the group felt the environment plays an important role in preventing HAIs. However, the environment’s role is different for different HAIs. For instance, the environment probably plays a smaller role for CLABSIs and SSIs than it does for MDROs, although all HAIs have an important environmental aspect to them.

For MDROs, the influence of the environment may depend on if it is endemic or epidemic. MDROs that are more affected by the environment include *C. difficile*, MRSA, VRE, *Acetobacter*, and *Pseudomonas*. Other gram-negative bacteria do not seem as affected by the environment because they do not last long in it.

The different ways HAIs transmit range from patient to the environment, patient to environment to patient, patient to health care workers’ hands to patient, patient to patient, etc. This led to a discussion on the emphasis of cleaning and infection, and the challenges that these aspects pose. How can this be standardized when there are so many products and different ways of doing things?

The cleanliness discussion led to the importance of environmental services workers. Often they are not recognized, so empowerment and education of them is important, along with other health care workers on the team. Some testimonials relayed that environmental services improved when the workers were given ownership over it.

The group pondered if it is possible to have minimum standards for turnover times and a checklist for the turnover process. The pressure for hospital room turnover may lead to shortcuts, so are there ways to set minimum standards for turnover?

## Discussion Highlights

1. The *C. difficile* issue has many moving parts: environmental, hand hygiene, and the physician's role. The antimicrobial stewardship issue with CDI will need to be addressed across the continuum of care, and perhaps this stewardship should be a condition for participation in increasing accountability; rates could be dependent on a testing methodology. CDIs may also be combatted by empowering the environmental services groups.
2. The reduction of CLABSI has been a major success. Now the focus needs to be on how to get the "late-late majority and laggards" on board.
3. MRSA is both a community and hospital problem. More surveillance is needed (e.g., intake forms that ask about a history of MRSA) and should be a Tier 1 recommendation, except for low-risk populations. The MRSA group recommended considering changes to CMS conditions of participation, certification, and enforcement.
4. The SSI and SCIP group noted that although surgical process of care measures have improved and topped-out, the gains in terms of outcomes of SSIs themselves have been modest. The group discussed the following five topics for improvement:
  - a. More research is needed to develop evidence-based guidelines for prevention, specific to one or a group of like procedures.
  - b. Advocacy is needed for strong leadership and the dissemination of best practices and guidance development.
  - c. Within the inpatient setting, there is a need to expand the number of procedures, outcomes, and risk factors measured.
  - d. There is a real need to expand the focus of reporting to outpatient settings.
  - e. Consider changes to CMS conditions of participation, certification, and enforcement.
5. The VAE group noted that the issue of VAE HAIs is different from the other groups because of the new surveillance definition for VAEs, so there is no track record. The feeling was that education and acceptance is needed to seek buy-in of the medical professionals. A number of specific suggestions were made for this outreach. Many recommendations for the new VAE definitions have been based on expert opinions making certain assumptions; further testing and validation of data is imperative.
6. The Intervention Across Setting of Care group wants QIOs and state health departments to continue to bring together the continuum of care on neutral ground. The group also recommended that across the continuum of care there be best practice tools for LTC and other entities, and standardized education. EMRs can be used to share information.
7. The HAI Surveillance as Patients Transition Across Care Settings and Communities group wanted an increase in the awareness about the burden of HAIs, perhaps using increased surveillance. A more common platform of communication and information sharing is needed, along with partnerships for bringing the continuum of care together and implementing programs and interventions.
8. The Patient and Family Caregiver Engagement group believed that health literacy needs to be improved, and that nurses, patients, and family members need to be more involved and empowered in care. It is also important to start health communications training with residents and fellows early.

9. The Coordination of Federal Programs group believed that there were multiple achievements, areas of opportunity, and consequences of federal coordination. Items discussed were:
  - a. The need to better communicate that leadership in the HAI elimination effort exists. The HAI Action Plan could be leveraged to provide a searchable, public list of the federal goals and activities.
  - b. Confusion among many different projects (e.g., HENs, states, and Medicare HAI reporting via NHSN).
  - c. The potential for getting more information from other collaboratives that fly under the radar of data acquisition, like “left out” hospitals.
  - d. Hearing from the different projects that are trying to reduce many HAIs and not just hearing SIR results at the end.
10. The Role of the Environment in HAI Prevention group believed that the multiple vehicles of HAI transmission emphasize the need for cleaning and infection prevention. The group discussed how this can be standardized for all HCPs. Some testimonials relayed that environmental services improved when the workers were given ownership over it. The group pondered if it is possible to have minimum standards for turnover times and a checklist for the turnover process. The pressure for hospital room turnover may lead to shortcuts, therefore, the group posed the question, “Are there ways to set minimum standards for turnover?”

## **PLENARY III: THE ROAD TO ACHIEVING THE HAI ACTION PLAN GOALS**

**Don Wright, M.D., M.P.H., Deputy Assistant Secretary for Health, HHS Office of the Assistant Secretary for Health**

Dr. Wright thanked all of the attendees and noted PowerPoint presentations are available on a thumb drive at the desk. This is one of four or five meetings that HHS has hosted on HAIs. A summary will be provided and information can be accessed at the HHS HAI Initiative page.

Where is this issue going over the next few months? The revised HAI Action Plan will be sent to the Secretary for approval by the end of the year. Moving into 2013, there will likely be a progress meeting focusing on ASCs ESRD facilities, and LTCFs. Ultimately that will feed into the HAI Action Plan's goals. The federal family is trying to align their goals with that of PFP and Healthy People's goals, so there are not mixed goals.

### **U.S. Department of Health & Human Services Agency Priority Goals**

**Marjory Cannon, M.D., Medical Officer, Centers for Medicare and Medicaid Services**

CMS coordinates the HAI priority goals with CDC, OASH, and AHRQ. The Government Performance and Results Act (GPRA) requires agencies to have strategic plans and goals, and to commit to performance improvement. The goals are tied to agency [HHS] resources. The GPRA Modernization Act of 2010 mandates a more comprehensive and integrated approach to performance improvement targets and goals. The new Act mandates that HHS commit to a few priority initiatives where significant, accelerated change could be achieved in 2 years without additional resources. Six agency-wide priority goals were set, and one of these was the goal to reduce HAIs, namely demonstrating significant, quantitative, and measurable reductions in CLABSI and CAUTI. The two-year range is October 1, 2011, to September 30, 2013. The goals' information is reported on a public website, [www.performance.gov](http://www.performance.gov), and it is featured in the HHS Strategic Action Plan and the President's budget.

The reductions percentages are 25% for CLABSI (a national SIR of 0.51) and 20% for CAUTI (a national SIR of 0.75); the baseline is 2010 SIR data. Every 6 months, HHS presents this goal to the Deputy Secretary and Chief Performance Officer, and they ask how likely it is that the goals will be achieved. HHS feels moderately high confidence that this goal will be met.

The goals' milestones to date have been met, including the current fourth quarter milestone that was the release of final results from AHRQ's national CUSP for CLABSI program. The results were very positive. HHS is also identifying resource needs.

Collaboration is one of the cornerstones of the HAI reduction goal; it allows for broad scale sharing of evidence-based prevention practices and sustained results. Collaboration takes place among not only the federal family, but also non-federal entities across the country. CMS, CDC, OASH, and AHRQ all want to spread synergy around the September 2013 goal, and it is key to enhancing patient and provider outreach while avoiding confusion and program fatigue. The goal should be presented in a streamlined manner and the collaboration helps accomplish this.

The contributing programs are:

- National Action Plan to Prevent Health Care-Associated Infections: Road Map to Elimination (OASH)
- Quality Improvement Organizations 10th Statement of Work (CMS)
- Partnership for Patients (CMS)
- Health Care-Associated Infections Program (CDC)
- National Healthcare Safety Network (CDC)
- Comprehensive Unit-based Safety Program (AHRQ)
- Healthcare Associated Infections Research and Implementation Projects in AHRQ's Patient Safety Portfolio (AHRQ)

Another strategy HHS is taking to accomplish the goal is to identify areas where resources are needed by tracking and monitoring results at the facility, state, and national level. Data tracking through CDC helps HHS to determine this identification process. Through data monitoring, including CDC's release of state-level SIR figures, HHS works to link program resources to areas that may need resources most. The Medicare Patient Safety Monitoring System, now led by AHRQ, is being used to compare broad trends in CLABSI and CAUTI.

The midway (September 2012) targets are:

- CLABSI: 12.5% reduction (national SIR = 0.60)
- CAUTI: 10% reduction (national SIR = 0.85)

Data through March 2012 shows the CLABSI SIR is 0.561 and the CAUTI SIR is 0.953. CLABSI efforts are ahead of their midway target, while CAUTI is a bit behind. The lag in CAUTI results are because the measurement period (October 2011 through March 2012) was done during the same time period when the CMS Hospital Inpatient Quality Reporting Program started, so many facilities began reporting for the first time.

Data validation efforts help to ensure that HAI data is accurate and trustworthy. HHS also highlights emerging electronic technologies as they relate to advances in HAI reporting. CMS is conducting its first national validation of CLABSI data from August 2012 to July 2013. CAUTI data will begin to be validated in May 2013.

## **Discussion Highlights**

1. The final approval of the HHS Secretary and the revised HAI Action Plan is expected before the end of 2012.
2. Dr. Marge Cannon of CMS reported that one of the six agency-wide priority goals is to reduce HAIs, namely demonstrating significant, quantitative, and measurable reductions in CLABSI and CAUTI.

- a. The two year range is from October 1, 2011 to September 30, 2013.
  - b. The reductions percentages are 25% for CLABSI (a national SIR of 0.51) and 20% for CAUTI (a national SIR of 0.75)
  - c. The goals' information is reported on a public website, [www.performance.gov](http://www.performance.gov), and it is featured in the HHS Strategic Action Plan and the President's budget.
3. The Medicare Patient Safety Monitoring System, now led by AHRQ, is being used to compare broad trends in CLABSI and CAUTI. The midway (September 2012) targets are:
    - a. CLABSI: 12.5% reduction (national SIR = 0.60)
    - b. CAUTI: 10% reduction (national SIR = 0.85)
    - c. Data through March 2012 show the CLABSI SIR is 0.561 and the CAUTI SIR is 0.953.
  4. CMS is conducting its first national validation of CLABSI data from August 2012 to July 2013, and CAUTI data will begin to be validated in May 2013.

## FINAL THOUGHTS

**Mary Brennan-Taylor, Patient Safety Advocate for the Consumer Reports Patient Project, Adjunct Faculty, Department of Family Medicine, University at Buffalo**

Ms. Brennan-Taylor thanked everyone who organized this thoughtful and productive meeting and stated it was a privilege to speak for those whose voices have been silenced. She reminded the audience that there is much to be encouraged about, but also much to be done, particularly with CDI.

“Please remember that there is a cherished face behind every cold statistic, and do not consider the battle won until there is zero tolerance for HAIs across all health care facilities, including long-term health care. Even one avoidable HAI is too many. Please continue to demand transparency, timely mandated reporting of all HAIs, and actionable strategies that may be used by health care providers and patients.”

“Failure Is Impossible” should be the HAI's motto. Thousands of future patients are relying on no failure in this endeavor.

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