

**Department of Health and Human Services  
Centers for Disease Control and Prevention  
National Center for Emerging and Zoonotic Infectious Diseases  
Division of Healthcare Quality Promotion**



**Healthcare Infection Control Practices Advisory Committee (HICPAC)**

**Meeting  
December 4-5, 2014  
Atlanta, Georgia**

**Meeting Summary Report**

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## Meeting Agenda

Healthcare Infection Control Practices Advisory Committee

December 4-5, 2014  
Emory Conference Center  
Silverbell Pavilion  
1615 Clifton Road NE, Atlanta, GA

### Thursday, December 4, 2014

Time	Topic	Purpose	Presider/Presenter
9:00	Welcome and Introductions	Information	Neil Fishman (HICPAC Chair) Jeff Hageman (HICPAC DFO)
9:15	CDC's Healthcare Infection Control Assessment for Ebola – Overview and Update	Information Discussion	Joe Perz (DHQP, CDC) Carolyn Gould (DHQP, CDC)
10:15	Update on CDC's Ebola Infection Control Education and Training	Information Discussion	Abbigail Tumpey (DHQP, CDC)
10:45	Break		
11:00	Issues Related to Tools and Strategies for Infection Control	Information Discussion	Michael Bell (DHQP, CDC)
12:15	Lunch		
1:30	Updates on MERS-CoV and Enterovirus 68	Information	Sue Gerber (DVD, NCIRD, CDC)
2:00	Updates to the Draft Surgical Site Infection Guideline	Information Discussion	Dale Bratzler (SSI Writing Group)
2:45	Break		
3:00	Updates to the Draft Surgical Site Infection Guideline (cont.)	Information Discussion	Dale Bratzler (SSI Writing Group)
4:15	Public Comment		
4:30	Liaison/ <i>Ex officio</i> reports		
5:00	Adjourn		

### Thursday, November 7, 2013

Time	Topic	Purpose	Presider/Presenter
9:00	Update on Global Health Security Antimicrobial Resistance Issues	Information	Jean Patel (CDC) David Henderson (NIH)
9:30	National Healthcare Safety Network (NHSN) Updates	Information	Dawn Sievert (DHQP, CDC)
10:30	Break		
10:45	CDC Laboratory Safety Update	Information	Michael Bell (DHQP, CDC)
11:45	Public Comment		
11:55	Summary and Wrap-Up		Neil Fishman (HICPAC Chair)
12:00	Adjourn		

## List of Participants

December 4, 2014

### HICPAC MEMBERS

Dr. Neil Fishman, Chair  
Ms. Ruth Carrico  
Dr. Sheri Chernetsky Tejedor  
Dr. Daniel Diekema  
Dr. Mary Hayden  
Dr. Susan Huang

Dr. W. Charles Huskins  
Ms. Gina Pugliese  
Dr. Selwyn Rogers  
Dr. Tom Talbot  
Dr. Michael Tapper

### DESIGNATED FEDERAL OFFICIAL

Mr. Jeffrey Hageman, Deputy Chief, Prevention and Response Branch, DHQP

### EX OFFICIO MEMBERS

Dr. William B. Baine, Agency for Healthcare Research  
and Quality  
Ms. Elizabeth Claverie-Williams, Food and Drug  
Administration

Dr. David Henderson, National Institutes of Health  
Dr. Gary Roselle, Veterans Administration  
Dr. Daniel Schwartz, Centers for Medicare &  
Medicaid Services

### LIAISON MEMBERS

Dr. Debra Blog, Association of State and Territorial  
Health Officials  
Ms. Kathleen Dunn, Public Health Agency of Canada  
Ms. Janet Franck, DNV Healthcare  
Dr. Michael Howell, Society of Critical Care Medicine  
Ms. Diana Gaviria, National Association of County  
and City Health Officials  
Mr. Michael McElroy, America's Essential Hospitals  
Dr. Richard Melchriet, Council of State and Territorial  
Epidemiologists

Ms. Michael Anne Preas, Association of Professionals  
of Infection Control and Epidemiology, Inc.  
Dr. Mark Rupp, Society for Healthcare Epidemiology  
of America  
Dr. Robert Sawyer, Surgical Infection Society  
Ms. Margaret VanAmringe, the Joint Commission  
Dr. Stephen Weber, Infectious Disease Society of  
America  
Ms. Amber Wood, Association of periOperative  
Registered Nurses

### CDC REPRESENTATIVES

Dr. Beth Bell, CDC/NCEZID  
Dr. Michael Bell, CDC/DHQP  
Dr. Denise Cardo, CDC/ DHQP  
Dr. Scott Fridkin, CDC/NCEZID  
Dr. Susan Gerber, CDC/NCIRD  
Mr. Jeremy Goodman, CDC/DHQP  
Dr. Carolyn Gould, DHQP/CDC  
Dr. Rita Helfand, CDC/NCEZID  
Ms. Dyann Matson Koffman, CDC/OADS  
Ms. Paulette Knights, NCEZID/ CDC  
Dr. Cliff McDonald, CDC/DHQP

Ms. Susan Morabit, NCEZID/CDC  
Ms. Amanda Overholt, CDC/DHQP  
Dr. Joe Perz, CDC/DHQP  
Dr. Loria Pollack, DHQP/CDC  
Ms. Arlethia Royster, NCEZID/DHQP  
Dr. Melissa Schaefer, CD/DHQP  
Dr. Issac See, CDC/DHQP  
Dr. Rachel Slayton, CDC/DHQP  
Ms. Erin Stone, CDC/DHQP  
Ms. Abbigail Tumpey, CDC/DHQP/PRB  
Dr. J. Todd Weber, CDC/DHQP/PRB

### MEMBERS OF THE PUBLIC

Ms. Kay Argroves, American Association of Nurse  
Anesthetists

Mr. Dale Bratzler, Oklahoma University Health  
Sciences Center

Ms. Kendra Cox, Cambridge Communications and Training Institute  
Dr. Matthew Davis, Spinal Cord Injury Service, TIRR Memorial Hermann  
Ms. Megan DiGiorgio, Gojo  
Mr. Gary Evans, Hospital Employee Health  
Mr. Hudson Garrett, PDI  
Dr. Bryce Gartland, Emory University Healthcare  
Ms. Heidi Gruhler, CDC/DHQP  
Ms. Shalom Hernandez, Piedmont Atlanta Hospital  
Ms. Linda Homan, Ecolab Inc.  
Ms. Eve Humphreys, Society of Healthcare Epidemiologists of America

Dr. Danielle Rentz Hunt, Abt Associates  
Mr. Alex Kessel, Baird Capital  
Ms. Irene Khan, Piedmont Atlanta Hospital  
Ms. Nancy Klinger, 3M  
Ms. Michelle Merrill, Bard  
Mr. Brad Prosek, Cubist Pharmaceuticals, Inc.  
Ms. Michelle Stevens, 3M  
Ms. Rachel Stricof, CSTE Consultant  
Ms. Lisa Tomlinson, Association of Professionals of Infection Control and Epidemiology, Inc.  
Dr. Martin Weisberg, Ethicon, Inc  
Ms. Cindy Winfrey, PDI  
Mr. Hugo Xi, CareFusion

## December 5, 2014

### **HICPAC MEMBERS**

Dr. Neil Fishman, Chair  
Dr. Hilary Babcock  
Ms. Ruth Carrico  
Dr. Sheri Chernetsky Tejedor  
Dr. Daniel Diekema  
Dr. Mary Hayden

Dr. Susan Huang  
Dr. W. Charles Huskins  
Ms. Gina Pugliese  
Dr. Selwyn Rogers  
Dr. Tom Talbot  
Dr. Michael Tapper

### **DESIGNATED FEDERAL OFFICIAL**

Mr. Jeffrey Hageman, Deputy Chief, Prevention and Response Branch, DHQP

### **EX OFFICIO MEMBERS**

Dr. William B. Baine, Agency for Healthcare Research and Quality  
Ms. Elizabeth Claverie-Williams, Food and Drug Administration

Dr. David Henderson, National Institutes of Health  
Dr. Gary Roselle, Veterans Administration  
Dr. Daniel Schwartz, Centers for Medicare & Medicaid Services

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Dr. Stephen Weber, Infectious Disease Society of America

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Dr. Denise Cardo, CDC/DHQP  
Dr. Scott Fridkin, CDC/NCEZID  
Dr. Susan Gerber, CDC/NCIRD  
Dr. Rita Helfand, CDC/NCEZID

Ms. Dyann Matson Koffman, CDC/OADS  
Dr. Cliff McDonald, CDC/DHQP  
Ms. Susan Morabit, NCEZID/CDC  
Ms. Amanda Overholt, CDC/DHQP  
Dr. Jean Patel, CDC/NCEZID

Dr. Joe Perz, CDC/DHQP  
Dr. Loria Pollack, DHQP/CDC  
Dr. Dawn Sievert, CDC/DHQP

**MEMBERS OF THE PUBLIC**

Ms. Kay Argroves, American Association of Nurse  
Anesthetists  
Mr. Dale Bratzler, Oklahoma University Health  
Sciences Center  
Ms. Kendra Cox, Cambridge Communications and  
Training Institute  
Dr. Matthew Davis, Spinal Cord Injury Service, TIRR  
Memorial Hermann  
Ms. Megan DiGiorgio, Gojo  
Mr. Gary Evans, Hospital Employee Health  
Mr. Hudson Garrett, PDI  
Ms. Heidi Gruhler, CDC/DHQP  
Ms. Shalom Hernandez, Piedmont Atlanta Hospital  
Ms. Linda Homan, Ecolab Inc.

Ms. Erin Stone, CDC/DHQP  
Dr. J. Todd Weber, CDC/DHQP/PRB

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Ms. Cindy Winfrey, PDI  
Mr. Hugo Xi, CareFusion

## Executive Summary

The Department of Health and Human Services (HHS) and the Centers for Disease Control and Prevention (CDC) National Center for Emerging and Zoonotic Infectious Diseases (NCEZID) Division of Healthcare Quality Promotion (DHQP) convened a meeting of the Healthcare Infection Control Practices Advisory Committee (HICPAC) on December 4 – 5, 2014 in Atlanta, Georgia. The Designated Federal Official (DFO) and Chair confirmed the presence of a quorum of HICPAC voting members and ex officio members on both days of the meeting. The meeting was called to order at 9:20 am on December 4, 2014.

Dr. Joe Perz and Dr. Carolyn Gould presented an overview of CDC's healthcare infection control assessment activities related to Rapid Ebola Preparedness (REP). REP activities have helped CDC define readiness criteria for Ebola treatment centers. The process has also identified challenges, convergent issues, and a variety of innovative solutions. Efforts to optimize and sustain the readiness of Ebola treatment centers are ongoing.

Dr. Abigail Tumpey presented an update on CDC's Ebola infection control education and training. The training includes online resources such as videos and other materials, conference calls, and live training events.

Dr. Michael Bell presented information on issues related to tools and strategies for infection control. CDC is struggling with how to implement precise, uniform infection control practices. Assessment of infection control practices, such as via the REP process, is valuable. HICPAC discussed these issues as well as training and engineering controls.

Dr. Sue Gerber provided updates on Middle East Respiratory Syndrome Coronavirus (MERS-CoV) and Enterovirus (EV)-D68. There appears to be ongoing transmission of MERS-CoV from camels and possibly other animals. There is spread in healthcare facilities, and seasonality has been postulated as a factor. There is no evidence of sustained community transmission. Three known strains of EV-D68 are causing infections at this time. They are genetically related to strains of EV-D68 that were previously detected in the US, Europe, and Asia.

Dr. Dale Bratzler presented, and HICPAC discussed, updates to the draft Surgical Site Infection (SSI) Guideline. Information from an updated literature review was applied to the draft recommendations in Antimicrobial Prophylaxis, Non-Parenteral Antimicrobial Prophylaxis, Oxygenation, and Skin Prep.

HICPAC liaison groups provided written and verbal updates. HICPAC stood adjourned from 5:03 pm on December 4 until 9:08 am on December 5.

Dr. Jean Patel shared information regarding Global Health Security (GHS) antimicrobial resistance (AMR) issues, including CDC's role in the AMR Action Package and the development of national and global surveillance programs.

Dr. Michael Bell described CDC's efforts regarding improving laboratory safety.

HICPAC stood in recess at 11:38 am on December 5, 2014. The next HICPAC meeting will be held in Atlanta, Georgia in March 2015.

## Department Of Health and Human Services

### Centers for Disease Control and Prevention

National Center for Preparedness, Detection, and  
Control of Infectious Diseases  
Division of Healthcare Quality Promotion

Healthcare Infection Control Practices Advisory Committee  
December 4 – 5, 2014  
Atlanta, Georgia

## Meeting Summary Report

The United States Department of Health and Human Services (HHS) and the Centers for Disease Control and Prevention (CDC) National Center for Emerging and Zoonotic Infectious Diseases (NCEZID) Division of Healthcare Quality Promotion (DHQP) convened a meeting of the Healthcare Infection Control Practices Advisory Committee (HICPAC) on December 4 – 5, 2014 at the Emory Conference Center, 1615 Clifton Road, Atlanta, Georgia.

## Thursday, December 4, 2014

### Welcome and Introductions

**Neil Fishman, MD**  
**HICPAC Chair**

Dr. Neil Fishman, HICPAC Chair, called the meeting of HICPAC to order at 9:20 am. He conducted a roll call of HICPAC members, *ex officio* members, and liaison representatives. A quorum was present. HICPAC members disclosed conflicts of interest.

- Dr. Tom Talbot's spouse receives research funding from Sanofi Pasteur, MedImmune, and Gilead Sciences, Inc., for vaccine studies.
- Dr. Dan Diekma has received funding from bioMérieux to study antimicrobial susceptibility testing devices. He has received funding from Decks to Walls, a company that produces antimicrobial surface coatings.
- Dr. Mary Hayden has received product from Sage Products, Inc. and from PDI, Inc. to conduct research at a hospital at no charge to the hospital.
- Dr. Susan Huang is conducting a trial in which participating hospitals are receiving contributed products from Mölnlycke Health Care and Sage Products, Inc.
- Dr. Michael Tapper has been retained by CoreMedics as a consultant on a new device for the prevention of catheter-associated infections.
- Ms. Ruth Carrico is on the Speakers Bureau for Sanofi Pasteur and Pfizer.



Mr. Jeffrey Hageman, HICPAC Designated Federal Official (DFO), welcomed new HICPAC liaison members:

- Mr. Michael McElroy, America's Essential Hospitals
- Dr. Stephen Weber, Infectious Diseases Society of America (IDSA)
- Dr. Richard Melchreit, representing Marion Kainer for the Council of State and Territorial Epidemiologists (CSTE)
- Dr. Deborah Blog, Association of State and Territorial Health Officials (ASTHO)

## **CDC's Healthcare Infection Control Assessment for Ebola – Overview and Update**

**Joe Perz, DrPH**

**Division of Healthcare Quality Promotion  
Centers for Disease Control and Prevention**

Healthcare preparedness requires a tiered approach as well as strong collaboration between the public health and healthcare communities. The Rapid Ebola Preparedness (REP) experience is leading toward a more coordinated, networked, and rational approach, including state and local health officials collaborating with their counterparts in healthcare in unique and encouraging ways.

Acute care facilities have three primary functions and can play one or all three of their roles:

- Act as a front-line healthcare facility in a “normal” capacity, operating an emergency department and receiving patients from the community
- Serve as a facility that specializes in the assessment phase and diagnostics of a particular disease, such as Ebola
- Function as treatment centers, such as for Ebola

Ebola treatment hospitals are prepared to provide comprehensive care to persons diagnosed with Ebola and to manage the full course of illness. This designation reflects a decision made by state and local health authorities and hospital administration. The decision is informed by, but not dictated by, the results of a CDC-led site visit. The guidance includes a table summarizing the capabilities a hospital needs to safely treat a patient with Ebola. The guidance also indicates that the decision to receive a patient with Ebola should be informed by discussions with public health authorities and referring physicians. On December 2, 2014, CDC released interim guidance for preparing Ebola treatment centers. Guidance has also been released explaining the tiered approach and other roles of healthcare facilities.

The REP teams began visiting hospitals identified by health authorities on October 19, 2014. The visits coincided with state and regional planning efforts and focused on facilities that appeared to be the most well-suited to handle Ebola. The objective of the REP visit is for the team and the facility to understand the facility's readiness to

treat an Ebola patient safely. The REP visit is not a certification process; follow-up visits are not conducted. Local authorities and hospital leadership designate Ebola treatment centers based on established criteria.

During the initial phase, the REP teams consisted of eight to ten individuals, typically four or five CDC staff, including representation from the National Institute for Occupational Safety and Health (NIOSH) to assess infection control, laboratory safety, environmental and waste issues, and worker safety. Experts from the Association of Professionals of Infection Control and Epidemiology (APIC), the Society for Healthcare Epidemiology of America (SHEA), and IDSA also joined the initial visits. Federal partners also participated on the teams, including individuals from regional offices from the Office of the Assistant Secretary for Preparedness and Response (ASPR) and personnel from the US Department of Veterans Affairs (VA) and the US Department of Defense (DoD). The visits helped federal partners better understand preparedness in their systems. State and local health officials also participated in the visits, which were a unique opportunity for Healthcare-Associated Infection (HAI) programs to be integrated into onsite assessments and to integrate with CDC and other colleagues at the hospital and health system levels.

The visits usually last one full day. The most important aspect of the visits is a walk-through to assess a number of domains:

- Pre-hospital transport plans, emergency medical services (EMS), Emergency Department (ED)
- Staffing of Ebola patient care team
- Patient transport from point of entry to designated Ebola treatment area
- Patient placement
- Personal Protective Equipment (PPE) and procedures for donning and doffing
- Monitoring healthcare personnel and managing exposures
- Laboratory safety
- Environmental infection control and equipment reprocessing
- Management of waste
- Communications

The domains are reflected in a 30-page tool which has evolved as the guidance has evolved.

The risk-based strategy for prioritization of REP team activities was first guided by urgent need to better support the enhanced entry screening at five US airports. The first REP activities occurred in Georgia, Illinois, New Jersey, New York, and Virginia. Other areas of the country had persons still in the 21-day incubation period, so it was important to ready facilities in those areas in the event that a case should manifest. The REP teams worked in areas with high volumes of returning travelers as well as where there were known contacts with Ebola cases and concerns for secondary cases. REP team activity also took place in areas to provide regional coverage. As of December 1, 2014, REP team assessments have been conducted in over 50 unique hospitals in 15 states and Washington, DC.

Hospital facilities, as well as state and local authorities, do a great deal of work in advance of the REP visit. Work continues after the REP visit so that facilities progress on the pathway to readiness to treat Ebola. CDC is interested in helping to fill gaps identified in the assessments.

**Carolyn Gould, MD**  
**Division of Healthcare Quality Promotion**  
**Centers for Disease Control and Prevention**

The number of REP visits has been increasing. A coordinated approach is needed to track the facilities' needs and requests for assistance as well as to discern ways to help facilities optimize their readiness and preparedness. Post-REP team activities respond to the need to coordinate information and resources to fill identified gaps.

The post-REP activities include identifying partners and subject matter experts (SMEs) at CDC to assist hospitals that have had REP visits. The readiness domains help to categorize needs and identify the best mechanisms for assistance, which may include additional onsite assistance, training, procurement of PPE, or technical assistance and advice:

- Facility infrastructure
- Patient transportation
- Laboratory
- Staffing
- Training
- PPE supply
- Waste management
- Healthcare personnel monitoring
- Environmental services
- Clinical care
- Operations coordination

CDC developed a contract with Emory Healthcare and the University of Nebraska Medical Center to provide technical assistance to the post-REP hospitals, including:

- Onsite technical assistance during post-REP visits
- Training courses at Nebraska and Emory
- Content calls
- Continuity consultants

Hospitals often need additional assistance with implementation of concepts and guidelines. The first experience with Emory and Nebraska was successful, as they provided detailed expertise from their experience engaging in Ebola patient treatment.

Members of the CDC Emergency Operations Center (EOC) Task Force also assist with post-REP work. They represent expertise in several domains:

- Worker safety (NIOSH)

- Pediatrics
- Clinical Care
- Environmental infection control/waste management
- Strategic National Stockpile

CDC works with local and state health departments to coordinate site visits and the overall approach, including the follow-up strategy and prioritization of hospitals. Coordination is also ongoing with ASPR and the Occupational Safety and Health Administration (OSHA). Information during REP visits is collected and tracked systematically. CDC also gathers feedback from hospitals regarding the impacts and benefits of the REP process.

REP activities have helped CDC define readiness criteria for Ebola treatment centers. The process has also identified challenges, convergent issues, and a variety of innovative solutions. Readiness is a progression, and hospitals are at different points on the spectrum. Progress has been remarkable. Efforts to optimize and sustain the readiness of Ebola treatment centers are ongoing.

### **Discussion Points**

HICPAC noted that the information gathered by CDC during the process, such as lessons learned, could help inform general readiness at hospitals. It would be helpful to make this information publicly available. Dr. Perz felt that CDC could consider publication in the medical literature. They have engaged in real-time communication as well, as the criteria in the interim guidance are evolving based on the content of the REP activity.

Many facilities have found the REP visit to be beneficial and helpful as the facility team addresses unanswered questions and narrows the focus of their work. A repeat visit, if feasible, would be beneficial to determine how far a facility has progressed.

There was discussion regarding acceptance of “downstream” aspects of Ebola treatment in light of the experience of Ebola cases at Emory University, where even though procedures were in place for waste management and incineration, the persons tasked with those functions would not perform them. Real-world experience tests preparedness and readiness. REP follow-up has developed and benefited from experiences in waste issues and other areas. State and local health officials participate in the REP visits and can address local restrictions and regulations. With the passage of time, systematic processes have been created and problems have been avoided or worked around.

The REP process focuses on treatment centers and facilities that appear to be capable and willing to serve in that capacity. Thus far, the facilities have been amenable to attaining the necessary level of proficiency and capability, and Dr. Perz was unaware of any facilities that had refused after being recommended for REP review by state and local officials. It would be impractical to send large CDC-led teams to conduct onsite assessments of the large number of Ebola assessment facilities. However, because the criteria for treatment and assessment centers are available, the process can likely be managed at the local level.

The interim guidance for Ebola treatment centers has been distributed widely, but it has undergone many changes. The current version of the guidance is the 13<sup>th</sup> version. A table of various domains and example capabilities is provided with the newly-released guidance. The more extensive assessment tool is a practical tool for use in the field and is not meant to serve as a formal guidance. That tool has been widely shared with partners

such as the American Hospital Association (AHA), and those organizations and HAI programs at state health departments have been encouraged to share it widely.

HICPAC commented that sharing the guidance or even a checklist of components or categories, even though it is still undergoing changes, would be helpful. Many HICPAC members and liaisons represent facilities that have been designated as Ebola treatment centers. HICPAC members indicated that the tool had been helpful at their institutions as a means to develop their own assessment and to learn about their gaps.

There have been two deaths on US soil from Ebola, but many more deaths from SSIs and other infections. The REP approach and its lessons may present opportunities to address fundamental problems in all hospitals regarding prevention of infections. CDC has been discussing how to use the REP experience in a sustainable manner to continue to address problems with HAIs. The REP work applies to the Targeted Assessment for Prevention (TAP) strategy, which takes a proactive approach with partners, hospitals, and health departments to identify challenges and gaps in infection control and to find ways to better implement guidelines.

It has not been easy for CDC, or any organization or facility, to respond to Ebola while trying to continue with normal operations. Although progress is being made regarding some types of infections, overall infection control is not improving satisfactorily. The experience of the REP teams may inform the systems of public health and healthcare on how to assess hospitals on a regular basis, not just during a crisis, to make improvements in adherence infection control practice. CDC's work in infection control tends to be crisis-related, but the Ebola experience has shown that CDC brings unique expertise, knowledge, tools, and leadership to help move the field forward.

HICPAC discussed the issue of economics. One way to determine how to make these efforts sustainable is to collect feedback from facilities on the economic impacts associated with becoming an Ebola treatment center and improving infection control. Personnel with economic or administrative expertise could be included in the REP process so that their insights can inform future guidelines and recommendations for sustainability. As hospitals have described the economic impact of this work during the REP visits, the expenses include construction and equipment costs, as well as unmeasured costs such as staff time and training. CDC has not collected that information systematically, however.

Sustainability is discussed during REP visits, including models for training, re-training, and preparation. These approaches vary depending on a hospital's staffing model and other factors. Many of the hospitals that have invested in this work see that they are not just preparing for Ebola, but for a number of other problems. Hospital systems are engaged as part of state preparedness efforts. Casting infection control as a basic preparedness function is a good approach.

HICPAC hoped that Ebola-related activities will continue to push aspects of infection prevention and control and personal protection that do not include PPE. Front-line healthcare personnel may perceive that their only protection is through PPE and not through other infection control practices.

Maintaining readiness is a challenge. When a threat is no longer imminent, it is human nature to allow readiness to wane. Drills and simulations are a mechanism for sustaining readiness. Every Medicare-certified and/or accredited institution must conduct drills. The Ebola work is instructive to this process and is an opportunity to marry emergency management standards with infection control standards. To the extent that the Ebola checklist has elements that can be generalized to other infectious threats beyond Ebola, there is an opportunity to

encourage organizations to conduct drills and simulations in infection control that they generally have not done so that the US has not just several dozen hospitals capable of handling a highly infectious agent such as Ebola, but that there are thousands of facilities capable of handling *Clostridium difficile* (*C. difficile*) and other infections.

The concept of translatability is appealing, but the functional maintenance of preparing for an Ebola patient may not be pragmatic. Because of demands related to Ebola, some facilities are behind in their surveillance for other, more common and deadly diseases. There is friction between the balance of the takeaway that can be maintained and useful and the “one-off” preparation for Ebola, such as PPE that has been purchased but will likely never be used. When Ebola is controlled, US facilities will not maintain the very high level of re-training necessary to handle an Ebola patient.

Ebola preparedness will “stand down” at some point, but there are lessons to be learned from the approach that was taken to prepare for Ebola. Those lessons and the infrastructure that was developed can be applied to other settings. The lessons from Ebola should be stated concretely. A general statement about broad translation will not be as useful as a specific statement about the facets that will be most translatable, in what way, to which common pathogens, and about the investments that hospitals should make. Much of the work seems to have emphasized what is different or special about Ebola, such as waste handling, PPE, or laboratory practices. In order to translate the lessons learned from the Ebola experience and apply them more broadly, it will be important to shift the emphasis to common approaches to the prevention of all HAIs.

There is an opportunity now to work with professional organizations and societies that to date have given no meaningful attention to infection control. They are publishing and advocating for members of their groups who provide care at the bedside and who are responsible for maintaining infection control practices. If their interest is sustained, then there can be a bigger, long-term win.

There was discussion regarding drilling, staff time, and other issues for the institutions with these treatment units pre-Ebola, including costs associated with maintaining the unused unit(s) and drilling staff. In one example, a cadre of volunteer healthcare providers in a variety of specialties at the institution underwent drills three to four times per year and worked on various hypothetical situations to maintain readiness. The drills addressed many of the day-to-day issues encountered in caring for these patients, but Ebola presented unanticipated situations, particularly regarding point-of-use laboratory testing. The facility planned to conduct laboratory work in the clinical laboratory, but that laboratory would not work with the Ebola specimens from the first patient. The expenses involved with creating the unit were largely absorbed by the institution, but there are significant expenses associated with the care of an individual patient. It probably does not make economic sense to have a large number of facilities with such specific units. The bottom-line cost to maintain them when they are not used must be considered. It is expensive to have these units “mothballed” and yet ready to take on patients quickly. The most practical approach is a dual-use capability. One facility’s unit has been used to overflow patients when the hospital is full. It is used for education and training for issues other than biopreparedness as well.

Interactions that healthcare personnel had with patients in which transmission did not occur should be considered as part of planning, as these experiences underscore the reality of dealing with Ebola and highly infectious diseases.

DHQP and CDC are learning from the REP experience and process to improve infection control not just in designated hospitals, but overall. The Ebola response and REP process have raised the visibility of infection control

and provided the opportunity to assess it across systems in a manner that it has not been assessed before. HICPAC's feedback regarding keeping infection control visible in hospitals and healthcare systems will be valuable.

Many positive secondary gains have occurred and can be translated, such as the approach to screening individuals that come into a facility and attentiveness to donning and doffing PPE, as the training applies to other situations. The Ebola response had granular-level detail regarding the steps of basic practices, such as contact precautions and waste management. All workers should be trained in those competencies. These lessons will likely translate on the individual level, but it will be a challenge to synthesize them across systems.

The REP tool was constructed as an offshoot of the Centers for Medicare and Medicaid Services (CMS) Infection Control Survey Tool, which focuses on minimum infection control standards for all hospitals. HICPAC said that it would be helpful to determine which elements of the REP tool are generalizable so that it can still be used when the Ebola situation stabilizes. CDC can articulate the elements that were common across the many sites the REP teams have visited. It would also be helpful to reinforce the importance of regular infection control practices and to remind facilities of the number of people who die of Multidrug-Resistant Organisms (MDRO), for instance, as compared to influenza and Ebola. Making these points explicit may affect the culture model around infection control.

## **Update on CDC's Ebola Training**

**Abbigail Tumpey, MPH CHES**

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**Division of Healthcare Quality Promotion**

**Lead, Medical Care Task Force Communications and Healthcare Training Team for the Ebola Response**

**Centers for Disease Control and Prevention**

Ms. Tumpey described CDC's work in healthcare worker education and training regarding Ebola and asked for HICPAC's feedback regarding how CDC has done, what they can do better, and how they can move forward.

The work of the Medical Care Task Force Communications and Healthcare Training Team for the Ebola Response and its partners has included a significant amount of work in domestic, international, and environmental infection control. Ebola has presented a number of opportunities, including making a strong case for infection control and lessons learned that can be applied to other patient safety issues. Additionally, the response has led to coordination among new partners, such as OSHA, the National Institute of Environmental Health Sciences (NIEHS) at the National Institutes of Health (NIH), healthcare unions, clinical professional organizations, and public-private partnerships.

A number of challenges are associated with Ebola healthcare worker education. For example, facility and provider types differ widely in levels of preparedness, education levels, and roles. Infection control is not "one size fits all," so tailored guidance and educational resources are needed for different settings and provider types. Clear and consistent messages are needed for the many groups participating in the response from the federal, state, local, and private sectors.



Education and training materials should be action-oriented and modular so that specific audiences can understand their needs and roles. The materials should be clear and consistent, on-demand, mobile-accessible, available in multiple formats, and promoted through numerous channels. Endorsement from key stakeholders and partners is also important.

Ebola healthcare worker training has taken place in many ways, including web resources, online training, webinars and partner calls, live events, and public-private partnerships. When the Ebola outbreak began, the Ebola resources on CDC's website included approximately three web pages. The resource now includes over 100 pages. Further, the pages were not readily accessible via mobile devices. CDC quickly redesigned the site so that it could be accessed via mobile devices, given that approximately 45% of people coming to the Ebola page were healthcare workers and over 40% of them were utilizing mobile devices. In November 2014, the healthcare worker page of the Ebola site has been viewed over 160,000 times.

Because users may not read the Ebola guidance in detail, the web resources include plain-language materials to accompany the guidance. These materials include algorithms and checklists. Short videos on the site provide rationales behind some of the recommendations. More slide decks and videos are being added. When the site grew quickly, it became somewhat unmanageable, so it is being redesigned with categories for different specialties or settings to enable users to find the guidance that relates to them.

Training resources are also available online. A PPE training video created in collaboration with Johns Hopkins University, APIC, SHEA, and Miami University was launched at the end of October, 2014, and was viewed over 300,000 times in the first month. The video allows users to choose their type of PPE and to view a tailored video. CDC has worked with Medscape on a series of commentaries and a shorted PPE video focused on donning and doffing. Those resources have been viewed over 373,000 times since the beginning of the outbreak.

Since the beginning of the response, CDC has conducted over 130 webinars or conference calls and reached over 150,000 individuals with different groups and organizations. The webinars and calls allow personnel to ask questions directly. In the 10 days after the PPE guidance was released on October 20, 2014, approximately 900 inquiries were received by CDC's Information Line.

Live training events are a new approach. CDC partnered with Partnership for Quality Care, hospital associations, and healthcare unions to conduct two live events, one in New York City and one in Los Angeles. Over 5000 individuals and 53 media outlets attended the New York City event in person, and the event streamed to 20,000 people in 10 countries. The governor of New York and the mayor of New York City attended the event. It included a plain-language talk on the basics of Ebola and infection control as well as a live PPE demonstration. The audience was highly attentive, as new PPE guidance had been released the previous night and concerns were high among healthcare workers regarding Ebola.

The Ebola response has also included several public-private partnerships. CDC worked with Medscape during the 2009 H1N1 pandemic. Medscape has been a strong partner and resource. CDC has begun working with HealthStream, a learning management system that represents approximately 70% of US hospitals. HealthStream will include the training videos on their learning management system. Apple, Inc. is also sharing the videos on iTunesU.

Next steps in training and education include the development of additional training videos in collaboration with Johns Hopkins University. The next set of videos will address needs of EDs in triage, administrative control, facility



setup, and appropriate PPE. Videos are also planned on environmental cleaning. Additional companion pieces are planned for each guidance document, including plain language slides and short videos. CDC is developing a curriculum that could be used in a train-the-trainer model and to improve preparedness at Ebola assessment facilities as well as front-line hospitals for basic infection control and other patient safety issues. Partnerships are also expanding to utilize existing training networks, such as through healthcare unions.

Ms. Tumpey asked for HICPAC's thoughts regarding the following questions:

- What more can CDC do?
- What training have you done for Ebola that would be helpful to implement for other topics?
- What lessons has your facility/organization learned from Ebola preparedness?

### **Discussion Points**

HICPAC complemented Ms. Tumpey and the team on the tremendous amount of work that they have accomplished in a short period of time. A great deal of energy and passion have been devoted to Ebola, and it is important to translate the creativity, efforts, and resources to have an impact on infections and other concerns that kill people every day but that do not have the same degree of energy.

Other concerns may have the same energy behind them, but not the same audience or the same visibility. The perception of crisis and fear has brought attention to issues that previously were only realized by infection control personnel. CDC's challenge is to use the visibility of Ebola for other issues and to build on their partnerships. Because the connection with Medscape began in 2009 with H1N1, they are able to work together on Ebola training. The live event in New York City opened up new possibilities and positive relationships with organizations and healthcare unions that conduct training. Discussions have begun with these and other partners about conducting live events focused on AMR. Further, lessons learned from the webinars and other strategies can be translated to other topics.

It was noted that the New York City live event was driven by the governor, who was in the midst of a tight election campaign. There was a concerted effort among the unions to have a strong turnout from their members to have a positive public relations effect.

HICPAC commented on the importance of controlling the message. The infection prevention and control field has not been able to control its message so that people can rally around it. People might rally around infection control if they knew about the ongoing issues that affect them daily and in ways that Ebola does not. The media has been an important facet of the Ebola outbreak. CDC can play a role in calming public panic as well as institutional panic, particularly regarding supply lines. There is a need to get in front of messages that may be false or not guided by science. It is important to address misperceptions quickly so that fear does not fester, which will lead to an erosion of trust in the official message.

A great deal of concern about Ebola has focused on protecting healthcare workers. It is not clear how to translate that motivation to protecting patients, who have been dying of HAIs for years. People's self-interest motivates their involvement in issues. It is not clear whether the momentum, public awareness, and visibility of Ebola can be translated to concerns about AMR, MDROs, or other infection control concerns related to patients.

HICPAC observed the need to build stronger ties with the pathology and microbiology communities. Improved messaging to that community regarding reasonable and safe approaches would be helpful. Individuals under investigation could suffer adverse outcomes due to unnecessary delays associated with clinical laboratories, as occurred in the Ebola outbreak.

Many of CSTE's partners, such as correctional facilities and home visitation organizations, have concerns. CSTE has had difficulty finding materials to adapt for them. It would be helpful to be able to adapt elements of the guidance documents or infographics for subsets of providers and groups.

Regarding delayed delivery of care of patients under investigation (PUIs), laboratories have provided feedback regarding the limited ability to run certain tests only in biocontainment. Guidelines are not available regarding cleaning or remediating equipment that has been contaminated with an Ebola specimen, so that equipment is often disposed of. More work is needed in this area.

Surveys of the public and healthcare professionals were suggested to determine the impact of the materials on understanding and people's responses.

## **Issues Related to Tools and Strategies for Infection Control**

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Ebola, like all viral hemorrhagic fevers, is transmitted by contact. It is not transmitted through the air, and environmental sampling shows that live virus is not present without blood. A great deal of Ebola-related activity is driven by fear, which is understandable given its high mortality rate and significant publicity.

The basic activities of infection control, such as identifying errors in practice and a facility's vulnerabilities are not occurring in a robust manner. These practices have eroded through the years as greater attention has focused on issues such as electronic health records (EHRs) and bundled practices related to device-associated infections. These issues are important, but they cannot be promoted at the expense of the basics. Infection control is not easy, and well-intentioned and heroic people make mistakes. The US is not uniformly able to implement constant, perfect infection control. There are centers and points of excellence, but there is variation even within facilities.

CDC is struggling with how to implement precise, uniform infection control practices. It is clear that assessment of infection control practices, such as via the REP process, is worthwhile. The REP teams, state health departments, and facilities have shared feedback that the exercise is valuable. Additionally, the elements of accountability and competency associated with the REP process have been valuable. These elements are not frequently part of infection control and foreshadow greater need.

The state and local public health models for restaurant inspections recognize that a facility might pass one month and not pass the next, due to management change or other factors. There is no reason to think that healthcare

care delivery is different. If a team changes, then there should be reassessments. The accountability and competency elements of healthcare infection control need to be more robust.

Training is desired and in high demand, but training without education is insufficient. People need to understand why procedures are in place. When clinical laboratory staff refuse to work with a specimen because it might have a certain pathogen, it is an indictment of education, not of training. This scenario and others point to the need to reconsider how front-line physicians and nurses are educated. There has been an erosion of the basic microbiology that leads to awareness of germ theory. It has been supplanted by other important elements and new models, but there may be a need for longer education or different and more rigorous continuing education. The people who are implementing infection control practices must understand what they mean and why they should be effective.

Parallel to these concerns are issues regarding the structure of how care is delivered. Greater attention can be paid to staffing capacity. When staff barely have time to monitor patients in an intensive care unit (ICU), there is a tendency not to pay attention to all details. These problems grow as staffing diminishes further away from the ICU. Thought must be given to what constitutes sufficient staffing at the nursing level and for infection preventionists, and what that staffing should look like.

Elements of facility design and environmental hygiene are also related to these issues. Newly-built hospitals may be beautiful, but few improvements have been made in safety, especially with regarding to infectious diseases. With the number of temporary walls constructed related to Ebola infection control, there are opportunities to reconsider what an ED waiting room should look like, and whether there even should be a waiting area. There are opportunities to consider materials and to reduce the use of carpeting and soft surfaces. Industry has invested a great deal in environmental hygiene and has made great strides. There are opportunities to protect patients by systematically implementing these innovations.

The Ebola experience has led to tremendous focus on PPE, which is an important element of worker safety. The type of materials and design of the devices continue to be a poor match for delivering medical care. In general, the devices were designed for industrial applications. There are opportunities to promote investment in better devices that are designed for the healthcare setting.

The preparedness approach that relies on investing in manuals or facilities that are not used is not the goal. The goal is a healthcare system in which “everyone does it right, every time.” Meticulous attention to perfect care should not be driven by fears that a healthcare worker will become infected, but by a need to protect patients. It will be challenging to communicate and incentivize this work. CDC’s colleagues at CMS, accreditation groups, state and local health departments, and oversight groups all have roles to play.

### **Discussion Points**

HICPAC noted the need for more research on the components that are necessary and sufficient to prevent infections. Infection control is difficult and healthcare workers are stressed. They intrinsically want their patients to get better and do not want to do harm. It is possible that some of their requirements make it impossible to be perfect.

Any research should be balanced with the real epidemiologic risk. There is a difference between research that shows that something can happen under experimental conditions and the epidemiological understanding of the

risk of what it takes to provide protection the majority of the time. That type of research, translating scientific efficacy and possibility into pragmatic infection control, needs to be conducted.

There was discussion regarding how to develop infection control approaches and a structure within a framework of inter-professional approaches. Groups work together as a team, whether for provision of care or for addressing a particular problem. This framework enables them to move concepts and practices further upstream into educational preparation so that people are not learning infection control at the healthcare point of delivery. Infection prevention and control should have “a presence at the table” to impact medical education decisions in all healthcare professions. Some colleges of medicine are redesigning their curricula to reduce classroom time, which leads to competitions among various groups to keep their areas in the curricula.

The most consistent successes of other elements of healthcare quality have been related to payment incentives. However, this approach is “heavy-handed” and “top-down. It would be preferable for the professions to decide that these concepts are valuable and should form an important part of medical education. Infection control and other important areas do not necessarily lead to measurable benefits for the academic institution. Training that leads to expensive procedures or research dollars competes with infection control. The faculty of medical colleges is important, and few of them are likely to focus on infection control.

HICPAC is developing Core Practices, which may be an opportunity to create a plan for CDC to reach out to stakeholders in education and training programs to ask them formally to use the Core Practices as a model to determine the elements that should be incorporated into educational programs and front-line training.

Prior to the implementation of an effective training and education program, it is important to think of opportunities to implement risk assessment strategies. Each facility is unique in its specific needs according to patient population, demographics, the services provided, and other factors. Risk assessments show facilities their key focus areas and are a critical component of success in advancing program development. Facilities should be comfortable with and involved in implementing strategies to identify risks and to mitigate them in advance by involving key teams to discuss their roles in adverse outcomes, rather than waiting for an adverse outcome to make those decisions.

Having Ebola patients in US hospitals provides unusual opportunities to learn practical lessons. These facilities should not miss the opportunity to provide practical data.

The principles that apply in Biosafety Level (BSL)-4 laboratories do not translate well to healthcare. It is important to translate what occurs in the structured BSL-4 environment to the more chaotic environment of providing care. Similarly, industrial processes may be useful and instructive, but may not apply to medicine.

Regarding the built environment, additional concerns with the water supply, sinks, and the ventilation systems were noted. Engineering controls may be needed because they do not tire and they do not fail as humans do.

Engineering controls are critical, but from an implementation perspective, delivery of patient care is driven by human factors. A shift is needed to focus on monitoring practice. Healthcare workers perform work-arounds for a variety of reason, and these work-arounds have unintended infection prevention consequences that need to be addressed more regularly. Infection preventionists are careful to enter data and to ensure adherence to pay-for-performance deadlines, but hospitals are missing the front-line personnel who are monitoring and providing

ongoing feedback, education, and focus. These elements are working well with Ebola, but not with daily work in the prevention of HAIs.

The paradigm may need to shift from the idea of everyone doing everything right every time. The field has tried this approach with handwashing and it still has not worked. Handwashing compliance has improved with the introduction of the engineering control of alcohol, but the problem still exists.

An example was provided of one center that approached hand hygiene with the use of process improvement tools, which include not only systems engineering, but also change management to ensure sustainability. Hospitals at 45% hand hygiene compliance were brought to over 90% compliance. As their compliance increased, there was a point at which their infection rates fell notably. A tool was created to disseminate to all hospitals, but it has seen little pickup. The tool is only helpful in adhering to known processes. It does not help determine which processes should be adhered to. Research and causal analysis are required to determine the correct processes.

HICPAC asked whether the groups that develop guidelines and guidance include individuals with expertise in specific human factors, such as cognitive engineers and cognitive scientists. Industrial engineers have recently been employed as part of the healthcare enterprise, and some facilities are asking formal cognitive scientists to assist with design.

Another example was provided of an institution working with industrial engineers regarding optimization of Information Technology (IT) systems for certain programmatic areas. Persons with expertise in visual analytics and human/computer interaction helped determine how to present information in a way that is useful, consistent, and not confusing. There are opportunities to apply these approaches in antimicrobial stewardship and other areas. Infection preventionists would have more time and ability to teach and be engaged with other disciplines if their data collection requirements were streamlined, automated, and made less cumbersome. Providers also spend a great deal of time on documentation.

## **Updates on MERS-CoV and Enterovirus 68**

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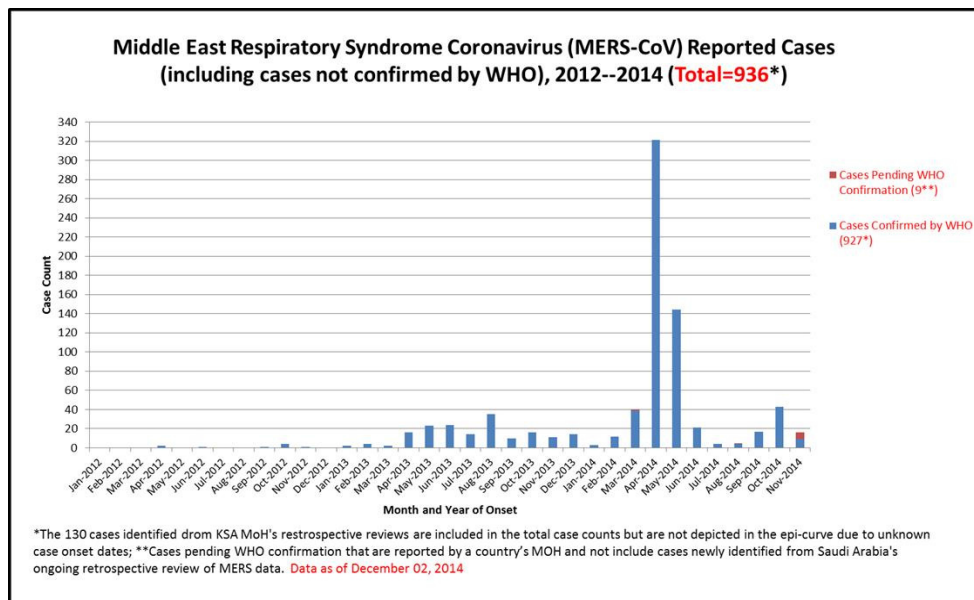
The first case of MERS-CoV was identified in a patient in Saudi Arabia in June of 2012. A second patient, a Qatari national, received medical care in the United Kingdom (UK). A hospital cluster in Jordan from April 2012 was retrospectively identified, and two confirmed cases were identified among hospital workers. The spread of MERS-CoV among families was confirmed in November 2012. Imported cases were identified in early 2013, and a hospital cluster in United Arab Emirates (UAE) was named in July 2013. Other countries began reporting primary cases, and in December 2013, Qatar identified an association with polymerase chain reaction (PCR)-positive camels in two individuals with MERS-CoV. There was an uptick of cases in the spring of 2014 associated with

several nosocomial outbreaks in Saudi Arabia and in UAE. Two cases in the US, travelers returning from Saudi Arabia, were identified in May 2014. There has been an increase in cases reported by Saudi Arabia in the fall of 2014.

There is speculation regarding seasonality and person-to-person spread of MERS-CoV, and a possible association with the birthing of camels in the spring. However, experience and data associated with this virus are only approximately two years old. To date, there have been 927 laboratory-confirmed cases and at least 339 deaths associated with the virus, with a case fatality rate of 37%. The most recent onset date is November 15, 2014, which suggests ongoing transmission. Recent cases are primarily from Saudi Arabia, with some from Qatar.

Throughout the entire outbreak, MERS-CoV has been seen predominantly in men for reasons that are unclear. The median age of cases is 48 years, but there have been some pediatric cases, particularly severe cases among children with underlying illnesses such as lung and cardiac disease. All reported cases have an epidemiological link, through travel or person-to-person contact with: Saudi Arabia, Qatar, UAE, Jordan, Yemen, Oman, Lebanon, Iran, and Kuwait.

The overall epidemiological curve of MERS-CoV is shown in the following graphic:



There is a lag in reporting from various Ministries of Health (MoHs) until the cases are confirmed by the World Health Organization (WHO). There was a large spike in cases from March through May 2014, and another slight increase beginning in October 2014. Transmission appears to have a recent nosocomial component, but several cases have been reported in association with animal or camel exposure.

The outbreak is also tracked by examining exported cases from the Arabian Peninsula. Recently, two cases have been identified with epidemiological links with Saudi Arabia in Austria and in Turkey. The impact of how transmission affects other countries is clear and reaffirms the need to ascertain travel histories from potential cases.

In the US, 501 patients have tested negative for MERS-CoV and two patients, one in Indiana and one in Florida, have tested positive. Forty-five states have either submitted specimens to CDC or performed their own testing. In 2013, an Emergency Use Authorization (EUA) allowed a real-time assay to be distributed through the Laboratory Response Network (LRN), which has helped surveillance efforts. Another important consideration is the return of individuals from the Hajj in the spring.

Person-to-person transmission of MERS-CoV is well-documented. A total of 36 spatiotemporal clusters have been reported among households or extended families and in healthcare settings. The median incubation period appears to be just over five days, with a range of two to fourteen days. The routes of transmission are not fully known. There is no clear evidence of sustained community transmission.

Recent data on MERS-CoV include a household transmission study published in 2014 in the *New England Journal of Medicine (NEJM)*. The study examined 26 index patients with MERS-CoV and 280 household contacts. Cases of secondary transmission were identified in six of 26 household contacts. Regarding how long patients shed, there is little information regarding virus isolation, but there is more information about RNA detection. In two patients in France, MERS-CoV RNA was detected in lower respiratory tract specimens approximately one month after onset of illness. RNA was identified in other specimens in one patient. The virus has been identified in stool, but currently there is no evidence for prolonged shedding in stool. However, very little natural history data is available, and more work is needed in this regard.

Dromedary camels from Oman and Spain were found to have neutralizing antibodies to MERS-CoV or a MERS-CoV-like virus. Since then, similar evidence of specimens from dromedary camels has been found from serologic assays in UAE (since 2003), Egypt (since 1997), Jordan (since 1992), Saudi Arabia (since 1992), Nigeria, Tunisia, Ethiopia, Kenya (since 1992), Somalia (since 1983), and Sudan (since 1984). Virus has been propagated from camel respiratory specimens. In Saudi Arabia, virus was isolated and sequenced from a patient and a camel, and the genome sequences appear to be identical. MERS-CoV sequences were later detected in an air sample from the same barn where the camel and the person had had contact. In Qatar, virus was isolated from a nasal specimen from a dromedary camel, and three dromedary camels with confirmed MERS-CoV sequences associated with the two human cases were identified. Egypt and Amman have reported MERS-CoV sequences from dromedary camels.

Little information is available regarding MERS-CoV and bats, but it is worth noting that there are similar sequences to MERS-CoV in some bats, which could have played a role in pathogenesis. A specimen from a bat in South Africa had similar RNA to MERS-CoV, but more information is needed to determine the role of bats in MERS-CoV over time. Camels appear to have a role as a type of reservoir for MERS-CoV, but there is a lack of epidemiology to elucidate the type of contact between people and camels.

In summary, there appears to be ongoing transmission from camels and possibly other animals. There appears to be significance in spread in healthcare facilities, including dialysis units, hospitals, and tertiary care hospitals. Seasonality has been postulated as a factor, and it has been suggested that many camels are born in the spring; however, many of the cases in the spring appear to be healthcare-related. More information is needed on the role of camel birthing. There is no evidence of sustained community transmission, but it is important to monitor genomic sequences for mutations that could facilitate transmission from person-to-person. Regarding special populations, there have been outbreaks among dialysis patients, and work is ongoing in Saudi Arabia on the role of underlying illness. Work is also ongoing in vaccines and antivirals.



EV-D68, which is not related to MERS, is not nationally notifiable in the US. Two voluntary, passive laboratory surveillance systems in the US include information about EVs: National Respiratory and Enteric Virus Surveillance System (NREVSS) and National Enterovirus Surveillance System (NESS).

Results from multiplex assays are reported to NREVSS. It is a means for tracking typical seasonality EVs in the US, which is usually in the summer and the fall. NESS provides some information regarding types that are circulating, but the information is extremely limited, as the system is voluntary and passive. It collects data on types of EVs and parechoviruses, and reports include age, gender, state, specimen collection date, specimen type, and virus type. NESS shows over many years, based on what is shared voluntarily from testing, what is circulating in communities. NESS has detected EV-D68 as well as parechovirus type 3, Cocksackie (C) A6, and other echo viruses.

Little background data is available for EV-D68. The systems are influenced by the attention received and the investigations performed. For instance, when pox-like lesions were associated with CA6 in the spring of 2012, many reports were received after the *Morbidity and Mortality Weekly Report (MMWR)* was released.

Before the current event, EV-D68 was thought to occur less commonly than other EVs. It was first identified in 1962 and has been known to cause respiratory illness and to infect children and adults. It is similar to rhinoviruses in the disease it causes and in its genetics. Clusters have previously been described in the US, Europe, and Asia. The largest cluster was reported from Japan, with 120 cases. Most of the clusters of EV-D68 have had less than 30 cases confirmed, and most clusters have been reported without fatalities, with some exceptions.

The first signals of EV-D68 in 2014 came with increases in severe respiratory illnesses among children, in the pediatric intensive care unit (PICU), and in hospitalizations as compared to the same time frame in previous years. Increases in rhinovirus/EV detections from multiplex PCR assays, which cannot discern the two, were reported as compared to the same time frame in previous years.

The initial investigation of EV-D68 was published in the *MMWR* in September 2014. There were 19 cases in the PICU in Kansas City, Missouri, and 10 of 11 cases in the PICU in Chicago, Illinois. The ages of the children ranged from 6 weeks to 16 years, with median ages of 4 and 5 years. Most patients had a history of asthma or reactive airway disease, or a history of wheezing. A minority of patients reported fever. Some surveillance for influenza-like illness did not detect EV-D68, and fever is a component of the case definition. The severity in the PICUs was notable, with some children requiring oxygen and mechanical ventilation.

Thus far, EV-D68 has been identified in 1121 patient specimens from 47 states and the District of Columbia. This detection includes testing by the CDC laboratory and four other state health departments. Prioritization for testing has been to send specimens from patients with severe respiratory illness, but specimens are also sought from potential discrete outbreaks, such as in long-term care facilities, or from adults and other populations, or from states or local locations without documentation of confirmed EV-D68 infections.

During the late summer and fall of 2014, several jurisdictions within the US reported increases in acute respiratory illnesses as compared to previous years; however, there have been anecdotal reports, as syndromic surveillance is measured differently in different locations, that those increases may not have been as high as in other jurisdictions. CDC is gathering information on activity from EDs, hospitalizations, and PICU admissions. The initial, preliminary data indicate that the cases are 58% male, with a median age of six.



The findings are somewhat limited, as few states have the ability to identify EV-D68 with laboratory testing. Previously, determining EV-D68 required sequencing of the Viral Protein (VP) 1 region of the genome. Generally, the capacity to identify the pathogen has not been widely available. However, since October 14, 2014, CDC has been using a real-time assay to detect EV-D68, and the methods have been made public. In general, there have not been real-time assays to detect specific EV and parechovirus types. In this circumstance, CDC's laboratory received many specimens that required a great deal of sequencing and manpower. The real-time assay has helped CDC identify EV-D68 in specimens.

Three known strains of EV-D68 are causing infections at this time. Comparisons of sequences from previous years have shown that they are genetically related to strains of EV-D68 that were previously detected in the US, Europe, and Asia. There are no significant differences in the sequences that are currently causing disease. Twelve patient-deaths have been identified and reported. These patients had EV-D68 detections, but the role of EV-D68 in their deaths is unclear, and investigations into the deaths are ongoing. EV-D68 was the prominent pathogen identified among the specimens that were sent to CDC for typing; however, other pathogens such as rhinoviruses, coxsackieviruses, and echoviruses have been co-circulated.

EV-D68 is not new, but extra resources are needed to identify it, and it could have dominated years ago. Increases in identification could be related to the availability of laboratory identification and the availability of syndromic surveillance. Not all of the respiratory illnesses contributing to the syndromic increases were EV-D68, but it has been the predominant EV strain this season and was detected in more specimens than expected. EV-D68 may play a role in asthma exacerbations, and this area will be investigated further. Infections were mostly seen in children, and children's hospitals were able to measure some of the syndromic surveillance. However, some adult infections were reported as well, particularly among adults with underlying diseases and were immunocompromised.

### **Discussion Points**

Notable transmission of MERS-CoV associated with the Hajj has not been detected. More transmission has been associated with more relevant healthcare facilities. There has been concern, however, about potential transmission when many people are in a small area.

HICPAC asked whether MERS-CoV is similar to Severe Acute Respiratory Syndrome (SARS) in the principal mode of transmission as airborne droplets or droplet nuclei. There were also queries regarding data on the method of transmission among healthcare workers and evidence of environmental or bloodborne contamination to suggest that there is something special about this virus. Dr. Gerber answered that there is limited data about natural history for MERS-CoV. One difference between MERS-CoV and SARS is that stool detection was more frequent for SARS. More information is needed regarding modes of transmission. In general, droplets are thought to be part of the spread of coronaviruses, but there is insufficient information and data to understand fully the transmission or the role of environmental decontamination.

Regarding the temperature at which viral replication of MERS-CoV occurs, Dr. Gerber said that there appears to be some slight differences in phenotypes between the different MERS that have been isolated and propagated in cell cultures. The virus can survive, but the temperature range is unknown.

HICPAC asked whether community-based transmission of EY-D68 occurs mostly in families or in daycare or other settings. Dr. Gerber answered that CDC has not conducted studies to collect that data. Like many other

enteroviruses, EV-D68 is likely to cause transmission within households and daycares. The investigations have begun with special populations, but other questions should be explored. The real-time assay will make those explorations more feasible.

Reports of paralytic polio-like disease in children were reported coincident with the EV-D68 outbreak. There was initial speculation regarding the relationship of that polio-like illness, which has been reported with other enteroviruses, to EV-D68. CDC is investigating reports of acute flaccid paralysis (AFP) from California and Colorado. There have been some specimens from children with EV-D68 who went on to have AFP, but there has not been decisive detection of EV-D68 in spinal fluid. Investigation is ongoing on the reports of AFP patients to understand whether there is a relationship with EV-D68.

The initial EV-D68 cases in the Midwest were detected because of the multiplex assay that was used routinely. More was known, and more quickly, because of the test. An AAP guideline for bronchiolitis suggests not conducting viral testing. It may be true that testing viruses is not necessary because the results do not impact care for most patients, but not testing means that surveillance will not capture necessary viral information. This issue illustrates the difference between clinical care and public health needs. As more vaccines and antivirals become available, it will be more important to know more about these illnesses, including EV-D68, and their causes and associations with other diseases such as asthma. The multiplex assay will detect some other human coronaviruses, but not MERS-CoV or SARS. However, a real-time-based assay depending on three gene targets has been distributed to some state health department laboratories.

Regarding how the rates of death related to EV-D68 compare to other enteroviruses, Dr. Gerber said that enteroviruses can cause a number of different syndromes. EV-D68 is primarily respiratory, which is slightly unusual. These viruses are common, and young children can be seropositive for many of them, as evidenced by outbreaks of hand, foot, and mouth disease in daycares. Investigations are ongoing with state and local health departments regarding the identification of EV-D68 RNA and the roles of other diseases, illnesses, infections, and conditions.

Containment and patient management are concerns. If EV-D68 is a significant clinical issue and can be spread to patients through or on medical personnel, then important steps may be taken. If it is ubiquitous and fairly mild, then the steps may be different.

## **Updates to the Draft Surgical Site Infection Guideline**

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Dr. Bratzler provided HICPAC with new literature that has been reviewed since the Draft SSI Guideline was published in the *Federal Register*. The original search ended in June 2011 and December 2011. When the draft recommendations were published in January 2014, there were requests for an updated literature review.

Title and abstract reviews were performed on 500 papers that were identified between 2011 and 2014. Full-text review was conducted on 64 studies, and new data from 34 randomized controlled trials (RCTs) has been applied to the draft recommendations in the following key topics:

#### Antimicrobial prophylaxis

- Timing – Cesarean Section (4 RCTs), Tourniquet Surgeries (2 RCTs)
- Duration – 6 RCTs

#### Non-Parenteral Antimicrobial Prophylaxis

- Intra-abdominal lavage – 1 RCT
- Antimicrobial Sutures – 11 RCTs
- Antimicrobial Dressings – 2 RCTs
- Topical Prophylaxis – 1 RCT

#### Oxygenation:

- 4 RCTs

#### Skin Prep

- Pre-Op Bathing, Chlorhexidine Washcloths – 1 RCT
- Antiseptic skin prep – 1 RCT
- Sealant – 1 RCT

Dr. Bratzler reviewed the Grading of Recommendations Assessment, Development and Evaluation (GRADE) methodology. RCTs receive the highest initial grade. Because the core section of the guideline focuses only on RCTs, all of the new studies have a high initial grade. The studies were subsequently rated based on inconsistency, indirectness, imprecision, and publication bias, as well as on strength of association, dose-response, and confounders. The overall quality grades are high, moderate, low, and very low.

The critical outcomes of interest for the guidelines are infection and reducing rates of SSIs. Recommendations were formulated based on three key inputs:

- Values and preferences used to determine the “critical” outcomes
- Overall GRADE of the evidence for the “critical” outcomes
- Net benefits, net harms, or trade-offs that result from weighing the “critical” outcomes

The CDC/HICPAC categorization scheme for recommendations is as follows:

- Category IA: A **strong** recommendation supported by **high to moderate quality evidence** suggesting net clinical benefits or harms.

- Category IB: A **strong** recommendation supported by **low-quality evidence** suggesting net clinical benefits or harms, or an accepted practice (e.g., aseptic technique) supported by low to very low-quality evidence.
- Category IC: A strong recommendation required by state or federal regulation.
- Category II: A **weak** recommendation supported by **any quality evidence** suggesting a **trade-off** between clinical benefits and harms.
- No recommendation: An **unresolved issue** for which there is **low to very low-quality evidence** with **uncertain trade-offs** between benefits and harms.

Dr. Bratzler reviewed the draft guidelines affected by the new literature searches.

### **KQ1. Antimicrobial Prophylaxis (AMP) – Parenteral**

What are the most effective strategies for administering parenteral AMP to reduce the risk of SSI?

KQ1B. What is the optimal timing of AMP in cesarean section: prior to skin incision or at cord clamping?

The *Federal Register* Guideline Recommendation for KQ1B reads: “Administer the appropriate single dose parenteral prophylactic antimicrobial agent within 60 minutes prior to skin incision in all cesarean sections. **(Category IA)**” The 1999 Guideline recommended administering the prophylactic antimicrobial agent immediately after the umbilical cord is clamped. Multiple guidelines address this topic, and they all recommend that the antimicrobial is delivered 60 prior to incision and not to wait until cord clamping. When the guideline was drafted, it was based on strong evidence that delivering the antibiotic before incision reduces post-Caesarian endometritis. Public comments indicated that the recommendation was vague or that it should refer to other guidelines.

Four new RCTs were identified that compared the benefit of administering parenteral AMP before skin incision and after cord clamping. Adding the new evidence to the previous evidence results in a strong odds ratio favoring the reduction of post-Caesarian endometritis. No significant improvement in abdominal incisional SSI is indicated, and there is no evidence of harm. Further, there is no evidence of neonatal sepsis or workups or admission to higher levels of care among neonates whose mothers received antimicrobials before incision.

The SSI Writing Group concluded that the additional literature supports the initial recommendation.

### **Discussion Points**

Dr. Diekema moved and Dr. Tapper seconded to approve the recommendation as written. HICPAC approved the motion unanimously with no abstentions.

KQ1C. What is the optimal timing of AMP in surgeries using tourniquets?

The Draft SSI Guideline in the Federal Register did not include a recommendation regarding antimicrobial timing and its relationship to tourniquet inflation. Public comments requested that the guideline address tourniquets. Some specialty societies are already on record suggesting that antimicrobials need to be fully delivered to the patient before a tourniquet is inflated.

Two RCTs pertaining to this issue were identified in the recent literature search. A 2011 study compared AMP five minutes prior to exsanguination and tourniquet inflation to AMP one minute after inflation. It was small and predominantly a podiatry study, and many of the operations listed did not include implants. The study indicated a

higher rate of infections in patients who received antimicrobials five minutes prior to exsanguination and tourniquet inflation. The other study, published in 2008, included knee arthroplasties. Patients received antibiotics either ten minutes prior to tourniquet deflation, or prior to tourniquet inflation. The study included approximately 900 procedures and found no significant difference in infection rates between the two patient groups. The American Society of Health-System Pharmacists (AHSP) guideline refers to this study.

The studies do not provide sufficient evidence to make a recommendation; therefore, the writing group concluded that the issue is unresolved and is classified as “no recommendation.”

### Discussion Points

The draft guideline did not make specific reference to the timing of antimicrobials and tourniquets. If the issue is included, then it will be classified as “no recommendation” and included in the general guideline as a new point under Key Question 1C on antimicrobial timing. One public comment was received on this issue, and it encouraged the guideline to address the issue of AMP timing and tourniquets and to state that antimicrobials should be administered before tourniquet inflation. HICPAC discussed whether the issue should be included.

Even though the 2001 podiatry study had a positive finding, it was very small. The larger 2008 study is likely to be more valuable, and it showed no difference. The 2008 study was European and randomized patients to receive antimicrobials either before tourniquet inflation or ten minutes before tourniquet deflation, and no difference in infection rates was indicated. This strategy is not typically used in the US. Most US hospitals would administer antimicrobials before skin incision, not before tourniquet deflation. The statement from the American Academy of Orthopedic Surgeons (AAOP), which is the US standard, is to administer antimicrobials before inflation. The recommendation is opinion-based only and not based on evidence.

It was generally agreed that there is not enough evidence to make a recommendation on this point.

Dr. Chernetsky Tejedor moved not to include the question. The motion was seconded. The motion was approved unanimously with no abstentions.

KQ1F. How safe and effective is postoperative AMP and what is the optimal duration?

The 1999 Guidelines made a Category 1A recommendation to maintain therapeutic agent in the serum and tissues throughout the operation and until, at most, a few hours after the incision is closed. The Draft SSI Guidelines published in the *Federal Register* stated: “In clean and clean-contaminated procedures, do not administer additional prophylactic antimicrobial agent doses after the surgical incision is closed in the operating room, even in the presence of a drain. **(Category IA)**”

The draft recommendation was based on evidence from a review of 38 different RCTs, most of which were published before 1999. A group of the RCTs compared no post-operative antibiotics versus any other duration after surgery, and approximately half of the studies examined two separate durations of AMP. The writing group excluded studies that did not utilize the same agents in both arms of the study, as many studies compared different durations of different antibiotics. The group only considered studies that compared parenteral doses. Not all of the studies reported intraoperative redosing protocols. The writing group determined “duration” to refer to post-closure. The critical outcome for all of the studies was SSIs.

Ultimately, the draft recommendation was based on a meta-analysis of the 19 studies that had a “none” comparison to any other duration of AMP. The group included seven colorectal, six orthopedic, three gynecologic, one vascular, one mixed, and one cardiac study. With the critical outcome of SSI, there was no benefit of continuing AMP after closing the skin incision in the operating room.

A great deal of public comment was received on this issue. Some comments suggested aligning with the Surgical Care Improvement Project (SCIP). The current national performance measure under SCIP is to stop all antimicrobials within 24 hours of surgery, and 48 hours for cardiac surgery. CMS is retiring that measure at the end of December 2014, and the only SCIP measure that will remain after January 1, 2015 is glucose control for cardiac surgery. One comment noted that there is not an RCT for every operation. Another comment suggested wording changes.

When HICPAC reviewed the public comment, the next actions were to update the literature review and the meta-analysis and individual comparators, and to discuss the recommendation related to other recommendations for antimicrobial duration.

The literature review yielded six additional RCTs: one in cardiac surgery, one in gynecological surgery, one appendectomy, two in gastric surgery, and one hepatectomy. All of the studies showed no difference in SSI rates. The studies are not large and some of the confidence intervals are wide. Some of the studies had different time intervals. Considering only those studies that compared none versus less than or equal to 24 hours, a total of 21 RCTs are included. The analysis suggests no benefit of continuing AMP after closing the skin incision in the operating room.

HICPAC received a formal letter from the Society of Thoracic Surgeons (STS) expressing concern about the recommendation for no additional antibiotics post-surgery. The letter referred to a systematic review published in 2011. That meta-analysis compared less than 24 hours to greater than or equal to 24 hours of prophylaxis. The study favored prophylaxis for 24 hours or more. SCIP previously considered this meta-analysis, and the HICPAC SSI Writing Group reviewed each of the individual studies in it to ensure that they were included in the literature review. Many of the studies in the meta-analysis compared different antimicrobials in the two study arms, comparing different durations of different drugs. For that reason, the SSI Writing Group excluded those studies from the analysis.

The authors of the meta-analysis conducted a sensitivity analysis and concluded that even when those studies were excluded, the results were not quantitatively affected, and the relative risk for infection was two, indicating statistical significance to support administering antibiotics for 24 hours or more. There are concerns, however, because one particular study (Tamayo 2008) was the biggest contributor to the meta-analysis. The SSI Writing Group conducted a detailed review of this study and found that it double-counted infections several times. The study was included in the SSI Writing Group review, but with the appropriate numbers based on a review of the methods of the paper and its results to include only the infections that were reported once.

Three RCTs were included in cardiac surgery that examined no antimicrobials versus any duration. No benefit of additional antimicrobials after wound closure was indicated. The SSI Writing Group re-reviewed those trials with their stated criteria. The point estimate is 1.8, and the confidence intervals are wide. The conclusions are not significant, but the writing group has been in discussion regarding how to interpret the studies. The group has also noted that the odds ratio is not different from the sensitivity analysis of the 2011 systematic review.

Existing guidance in this area includes:

- STS – AMP duration for all cardiac procedures should be less than or equal to 48 hours (2006)
- Treatment Guidelines from The Medical Letter – Surgical Prophylaxis AMP duration should be less than 24 hours for most procedures (2012)
- ASHP Guidelines – AMP duration should be less than 24 hours for all patients (2013)

The *Federal Register* Draft Recommendation is:

*“1E. In clean and clean-contaminated procedures, do not administer additional prophylactic antimicrobial agent doses after the surgical incision is closed in the operating room, even in the presence of a drain. (Category IA) (Key Question 1E)”*

### Discussion Points

HICPAC observed that cardiac surgeons culturally tend to be resistant to change, perhaps because of their training programs and/or because that group is tightly tracked in areas such as SSIs and glucose control. They will utilize any strategy possible to try to reduce the risk of SSIs.

Most chest and mediastinal tubes are removed within 48 hours, as they are perceived a “highway” for pathogens to come into the space that is in contact with the sternum. Some training programs teach 48 hours as a “magic window” regardless of the evidence. The STS letter argued for the 48-hour timeframe because many of the patients are purposely hypothermic and because of large fluid shifts that are associated with cardiovascular or cardiopulmonary bypass.

There was discussion regarding whether there is any physiological or biological reason to treat cardiac or thoracic surgery differently from other procedures. Some cardiac patients receive antibiotics when they come off of bypass, but every operation is different. Orthopedic surgeons who perform back operations may argue that their patients are prone, which increases their risk. This argument may not make physiological sense. The wording of the current recommendation is appropriate, as evidence does not point toward handling cardiac surgery differently from other operations. Ultimately, HICPAC should make a recommendation based on their analysis and interpretation of the available data.

In addition to the citation of the 2011 systematic review, the STS letter highlights the following points:

- High risk of mortality associated with mediastinitis
- Pharmacokinetics and antibiotics in cardiac surgery patients differ from other types of surgery due to several factors
- Use of cardiopulmonary bypass is associated with a number of physiologic effects that may predispose patients to disastrous SSIs
- Independent and unique factors affect the propensity of cardiac surgery patients to develop a mediastinal infection



HICPAC felt that while the points are well-taken, many of them also refer to trauma patients, who are unstable and experience fluid shifts, often with open abdomens and chests. The trauma practice is to stop antibiotics within 24 hours due to the risk of nosocomial infections. Other subpopulations of patients who undergo significant surgeries are not kept on antibiotics until all of the tubes are removed. Other disciplines beyond cardiac surgeons have similar concerns. For instance, colon surgeries see higher infection rates than cardiac surgeries, but some hospital administrations drive the push for administering antibiotics in cardiac cases.

Dr. Bratzler clarified that the draft guidance does not refer to antibiotics for 24 hours or less; rather, the recommendation is to cease antibiotics upon incision closure with no post-operative doses.

HICPAC discussed the implications of HICPAC's recommendation for hospital administrations and cardiac surgery divisions if their culture and practice will remain different from the recommendation. Each institution will determine whether to pursue culture change. *C. difficile* will become part of value-based purchasing and will carry a significant financial penalty. Cardiac surgeons may not adhere to the HICPAC guidelines, and in the absence of regulations, they are likely to continue to administer antibiotics for 48 hours because that is what they are trained to do. Conversely, a low percentage of surgeons may give antibiotics for 48 hours. Other groups, such as orthopedic and transplant surgeons, may also administer antibiotics for longer durations than recommended, largely due to a lack of data.

HICPAC noted that the analysis of the paper regarding cardiac duration was informative and helpful. It should be included in the guideline, whether in the narrative or in the appendix.

Dr. Diekema moved, and Dr. Rogers seconded, to maintain the recommendation as written. The motion carried with 11 in favor.

## **KQ2. What are the most effective strategies for local, non-parenteral AMP to reduce the risk of SSI?**

KQ2A.1. How safe and effective is antimicrobial irrigation?

The 1999 SSI Guideline made no recommendation regarding antimicrobial irrigation. The Federal Register Draft Guideline stated: "2A.1. No recommendation can be made regarding the safety and effectiveness of intraoperative antimicrobial irrigation (e.g., intra-abdominal, deep or

subcutaneous tissues) for the prevention of surgical site infection. (No recommendation/ unresolved issue) (Key Question 2A)" No studies were available to evaluate the question.

Public comment on this topic referred to the National Institute for Health and Care Excellence (NICE) Guideline, which states not to utilize antimicrobial irrigation solutions to prevent SSIs. The writing group updated the literature search in this area and found a single study, a small RCT, using Clindamycin-Gentamicin Solution. The study found a reduction in SSI compared to saline rinse alone.

The writing group concluded that sufficient evidence is not available to make a recommendation in this area.

## **Discussion Points**



There was support for not making a recommendation. An example was offered of an institution that stopped antibiotic irrigation and saw no impact. The practice is expensive and difficult to operationalize to all patients in a large hospital.

Drs. Tapper and Dr. Rogers moved and seconded to maintain the recommendation as written. The motion carried unanimously.

KQ2C. How safe and effective are antimicrobial coated sutures and when and how should they be used?

No recommendation was made in this area in the 1999 Guidelines. The Federal Register Draft Guideline stated: “2C. Use of antimicrobial coated sutures is not necessary for the prevention of surgical site infection. **(Category II)**” The basis for that recommendation was the review of four RCTs, including mastectomy, appendectomy, pediatric ventricular shunt, and pediatric general surgery. The meta-analysis showed no significant reduction in SSI rates. There was also no evidence of adverse effects from the use of triclosan-coated sutures.

Public comments indicated that the literature review supporting this recommendation was out of date, and a number of additional papers published since 2011 were suggested. The SSI Writing Group conducted an updated literature review, which yielded 15 studies. In the majority of the studies, coated sutures were used for deep tissue and not for skin. Four RCTs in colorectal surgery showed a substantial reduction in SSI rates. A meta-analysis of three RCTs in abdominal, laparotomy, and appendectomy surgeries showed no substantial reduction in SSIs. A meta-analysis of three RCTs of leg wounds did not show significant reduction in SSIs. One study of sternal wounds did not show significant reduction in SSIs. Other studies in breast cancer surgery and lower limb revascularization did not show benefit in the use of coated sutures. A meta-analysis of mixed surgery did not show significant reductions in SSIs. A single Pediatric Cerebrospinal Fluid Shunt Surgery study showed improvement in SSI rates when coated sutures were used to close the galea, and non-coated sutures were used cutaneously.

The SSI Working Group considered the new data in many different ways. When all of the studies are considered in a single meta-analysis, benefit of antimicrobial sutures is indicated; however, when the studies are considered based on organ space and deep or superficial infections, none was significant. The four RCTs focused on colorectal surgery demonstrate benefits of coated sutures in reducing infection rates. When all surgeries except colorectal surgeries are considered, even removing the shunt operation, there is a benefit in reducing SSIs associated with coated sutures.

The studies with significant results for fascial and/or subcutaneous closure with triclosan-coated sutures were mostly in colorectal surgery. Three studies considered coated sutures for closure of the skin, and only one of the three was significant.

After reviewing the literature, the SSI Writing Group concluded that there is good strength of evidence in colorectal surgery, particularly for closure of the fascia or subcutaneous tissue, for the use of antimicrobial-coated suture. It appears that the standard of care is sufficient for skin closure. Evidence for coated sutures is weaker in other operations because of greater heterogeneity. There may be benefit associated with coated sutures in subcutaneous tissue, but the evidence is weaker.

## Discussion Points

The literature review ensured that comparisons of different types of sutures were direct. Only one study compared silver-coated sutures, and it showed no difference. The meta-analysis includes approximately 5000 total patients, with 1200 in colorectal surgery. The writing group is comfortable stating that there is benefit, particularly in colorectal surgery and particularly for closure of the fascia and subcutaneous tissue. In the studies, the skin was usually closed with the surgeon's preference. Only one study suggested benefit of skin closure with coated suture.

HICPAC observed that the pediatric shunt surgery showed a high infection rate in the baseline group that did not receive coated sutures. The writing group was concerned about the quality of that study and therefore conducted a meta-analysis excluding it. Most of the other studies for subcutaneous closure, particularly in abdominal or colorectal surgery, had infection rates that were fairly consistent with those in other published papers.

The bowel prep was standardized across the two arms of each study, but not necessarily across all of the studies. The patients in the studies are undergoing elective surgeries. The studies utilized intravenous (IV) antibiotics alone and were the same in both arms of the study. Mechanical bowel prep with oral antibiotics is emerging as an effective strategy for reducing infection. That prep would probably take place before elective colon surgery. All colorectal surgery is not the same. Colorectal surgeries in a trauma setting are often combined with other surgeries. Trauma patients are not likely to receive that prep. Rates of SSIs in colon surgery are high. Oral antibiotics are an important factor to consider. They are also expensive.

It is possible that coated sutures are less effective in patients who received oral antibiotic prep versus patients who did not, but HICPAC has not held data to this type of standard previously when analyzing differences among studies and approaches. The point prevalences among the three groups are not very different.

Dr. Fishman reviewed HICPAC's options for a motion:

- Maintain the current recommendation, which is a Level II
- Recommend the use of antimicrobial-coated sutures for fascial and tissue closures in colorectal surgery
- Recommend the use of antimicrobial-coated sutures for fascial and tissue closures in all surgeries
- Make a stronger recommendation in colorectal surgeries and a weaker recommendation in other surgeries

In the cardiac surgery realm, HICPAC was making a recommendation against current culture. In this case, HICPAC will make a recommendation against culture in colorectal surgery, but in a different direction. However, HICPAC should make a recommendation according to what the data indicate. The sample size is large, and the effect is striking. If the data suggest it, then perhaps practice should change.

If there is an accumulating literature in the general area of antimicrobial sutures in a variety of different surgical settings, HICPAC can state that no recommendation can be made about the broader issue of when, how, and where to use antimicrobial sutures. Insufficient data is available to make statements beyond a narrow recommendation about a particular type of surgery and suture.

Regarding AMP duration, different data were available from different procedures, and an effect was shown when the studies were grouped together. In this case, all surgeries other than colorectal, save the pediatric shunt, did not show an effect. There is a precedent to state that while the bulk of evidence for all procedures suggests a benefit, the same clarity is not present when the studies are broken down by different procedures. There is

evidence for triclosan-coated sutures for colorectal deep tissue closure. It will be important for the guideline discussion to tease out these issues and to explain the narrow recommendation.

There was discussion regarding cost comparison and the lack of head-to-head comparison for other types of prevention strategies that may be moving to the forefront of prevention. Some studies highlighted the potential cost-benefit associated with reducing SSIs, which may outweigh the cost of the suture material; however, the cost is not trivial. The SSI Writing Group felt that the evidence for colorectal surgery is strong for closure of abdominal fascia or subcutaneous tissue, but that skin closure should adhere to standard practice. In other operations and at other levels of closure, coated sutures could be considered, but the level of evidence for this practice is lower.

Dr. Fishman suggested that the group work on a statement for this issue overnight and return it for a vote the next day.

KQ2D. How safe and effective are topical antimicrobial dressings?

The 1999 Guidelines made no recommendation in this area. The *Federal Register* Guideline Recommendation stated: “2D. No recommendation can be made regarding the safety and effectiveness of antimicrobial dressings applied to surgical incisions following primary closure in the operating room for the prevention of surgical site infection. **(No recommendation/ unresolved issue)**” The basis for this recommendation was a lack of RCT evidence evaluating the safety and effectiveness of the dressings. The public comment on this question noted that the literature search was outdated.

The writing group updated the literature search and found two RCTs, both fairly small, in elective colorectal cancer surgery. The patients received mechanical bowel prep. There was no difference in infection rates between the standard and silver dressings in the studies. One small RCT with moderate risk of bias in colorectal surgeries showed a reduction in SSIs. The dressings were continued for seven days post-operatively. Mechanical bowel prep was not used, except in patients undergoing left colon or rectal surgery. AMP was administered 30 to 60 minutes before incision. Perioperative antibiotics were discontinued within 24 hours. The study was non-blinded, and the writing group had concerns regarding its methodology. The writing group concluded that the existing recommendation should be unchanged.

### Discussion Points

Dr. Huskins moved, and Dr. Hayden seconded, to maintain the current recommendation. The motion carried unanimously.

### KQ6. Oxygenation

KQ6. In patients with normal pulmonary function, how safe and effective is the perioperative use of increased fraction of inspired oxygen (FiO<sub>2</sub>) in reducing the risk of SSI?

No recommendation was made in the 1999 Guidelines. The Federal Register Draft Guidelines are:

- “6A. For patients with normal pulmonary function undergoing general anesthesia with endotracheal intubation, administer increased fraction of inspired oxygen (FiO<sub>2</sub>) both intraoperatively and post-extubation in the immediate postoperative period. To optimize

*tissue oxygen delivery, maintain perioperative normothermia and adequate volume replacement. (Category IA) (Key Question 6)*

- “6B. No recommendation can be made regarding the safety and effectiveness of administering perioperative increased fraction of inspired oxygen (FiO<sub>2</sub>) for the prevention of surgical site infection in patients with normal pulmonary function undergoing either general anesthesia without endotracheal intubation or neuraxial anesthesia (i.e., spinal, epidural, or local nerve blocks). (No recommendation/unresolved issue) (Key Question 6)
- “6C. No recommendation can be made regarding the safety and effectiveness of administering increased fraction of inspired oxygen (FiO<sub>2</sub>) via facemask or nasal cannula only during the postoperative period for the prevention of surgical site infection in patients with normal pulmonary function. (No recommendation/unresolved issue) (Key Question 6)”

The recommendation was based on five RCTs comparing 80% oxygen to 30%, which suggested an approximate 40% reduction in the SSI rate. One low-quality RCT suggested a higher rate of infection, but there were concerns with the study. No benefit was shown with neuraxial anesthesia or with face mask or nasal cannula.

Public comment on this issue indicated that the evidence does not support a Category IA recommendation. No data validate its use in non-abdominal procedures. A suggested revision focused on the incomplete understanding of the clinical consequences of oxygen toxicity and the need to balance risks against the potential benefits of an increase in arterial oxygen content.

The writing group updated the literature review and found one RCT in abdominal, gynecological, and breast surgery giving intraoperative oxygen supplementation alone. There was no difference in infection rates. One additional RCT included patients undergoing general anesthesia, intraoperative intubation, and both intraoperative and postoperative administration of oxygen. It suggested a 40% reduction in SSI rates. Two additional studies examined neuraxial anesthesia and did not show significant benefit of additional oxygen.

The writing group did not make additional recommendations. All of the studies that show benefit are in abdominal or colorectal surgery. They considered the 2008 NICE recommendations, which are to “maintain optimal oxygenation ... sufficient oxygen during major surgery and in the recovery period to ensure that a haemoglobin saturation of more than 95% is maintained. Maintain adequate perfusion and temperature during surgery.”

## Discussion Points

The only SCIP performance measure that will persist in 2015 will be glucose control in cardiac surgery patients: all other measures are being retired.

Two meta-analyses were published in 2013 that concluded no benefit. A third meta-analysis in 2014 is in abstract form. The papers did not include new studies that were not already included in the HICPAC analysis. Any new studies did not meet the HICPAC inclusion criteria.

There was discussion regarding why the HICPAC conclusions differ from the two meta-analyses. There was concern about the opportunity to do harm. It is important to understand why the conclusions are discordant.

Regarding the availability of a summary statistic for the non-abdominal surgeries, the surgery types, different closures, and data were too different to perform a meta-analysis. It is possible to conduct the analysis to determine whether there is heterogeneity and provide the results to HICPAC. It was concluded that such an analysis would probably not provide much clarity.

The papers from 2008 are convincing, but only for colorectal surgery. It is not clear that the questions have been applied or investigated in other settings and procedures. Therefore, HICPAC should make a relatively narrow recommendation, not to extend beyond colorectal surgery.

This question addresses several points regarding making recommendations, such as how much stock to place in meta-analyses. In this case, two or three meta-analyses recommend against this practice, and it was noted that they could be “cherry-picking” trials and finding methodological flaws. In previous discussions about antimicrobial sutures, stock was placed in the meta-analyses. A great deal depends on how the evidence is presented.

Dr. Bratzler said that many studies were excluded due to a lack of documentation of maintaining normothermia or tissue perfusion. If the studies did not report that intervention, then they were not included in the recommendation. The recommendation is difficult because it refers to a specific group of patients.

The practice is difficult to operationalize, and some anesthesia providers have expressed concerns regarding the safety of hyperoxia. The recommendation of two hours is not trivial, considering hand-offs.

There has been a dramatic shift in the rates of minimally invasive colorectal surgery approaches since the older RCTs were conducted. The infection rate is likely to be less with minimally invasive approaches. These changes may have an impact on this recommendation.

Dr. Fishman summarized that HICPAC requests additional data and a breakdown of the meta-analyses.

### **KQ8. What are the most effective strategies for preparing the patient’s skin prior to surgery to reduce the risk of SSI?**

KQ8A. How safe and effective is preoperative antiseptic bathing or showering?

The 1999 Guideline stated that patients should shower or bathe with an antiseptic agent on at least the night before the operative day. The Federal Register Draft Recommendation was:

- *“8A. Advise patients to shower or bathe (full body) with either soap (antimicrobial or nonantimicrobial) or an antiseptic agent on at least the night before the operative day (Category IB) 94-102 (Key Question 8A)*
- *“8A.1. No recommendation can be made regarding the optimal timing of the preoperative shower or bath, the total number of soap or antiseptic agent applications, or the use of chlorhexidine gluconate washcloths for the prevention of surgical site infection. (No recommendation/ unresolved issue) (Key Question 8A)”*

It is important that the guidelines specify that they do not refer to a patient known to be Methicillin-resistant *Staphylococcus aureus* (MRSA) colonized. The original search did not identify studies that evaluated the safety and effectiveness of chlorhexidine-impregnated washcloths in combination with parenteral antimicrobial prophylaxis

and its impact on the risk of SSIs versus unmedicated bar soap. Public comment highlighted that only evidence from RCTs was considered, and that evidence for pre-operative bathing is not present or was missed. HICPAC decided to update the literature and considered updating the 1999 recommendation for 8A to advise patients to shower or bathe (Category IB) and to maintain “no recommendation” for 8A.1.

The new literature search yielded one RCT in elective shoulder surgeries which reported no infections in either group and therefore showed no difference between patients who were treated with chlorhexidine gluconate-impregnated cloths and who were not. The writing group did not determine that the new evidence changes the draft recommendation for 8A.1, but the recommendation should specify that it does not refer to patients colonized with MRSA or *Staphylococcus aureus*.

### Discussion Points

Other groups have released recommendations as part of their bundled practices. Those recommendations have created a perception that best practice is to preoperatively shower or bathe with chlorhexidine. Preoperative washing with chlorhexidine has been implemented as routine in many institutions without any evidence that the practice is better than bathing with regular soap the day before surgery. The practice is widespread. This recommendation is incongruous with standard practice for many institutions, regardless of whether data support the practice.

There may be no RCTs to support a recommendation, but there are large observational studies that reflect what it takes to get bacteria off the skin. The data are relatively well-known, and it is unfortunate that they have not been reflected in an RCT. This recommendation seems to be a subset of the first recommendation, which recommends a shower or bath, but clarifies that there are no RCTs regarding their timing or number. It may be worth including a sentence in a discussion point to clarify that while there are no RCTs, there are established observational studies in surgical patients and normal volunteers. If the goal is to reduce colonization, then it may be important to mention that data are available.

Dr. Diekema moved that no change should be made to the draft recommendation. Dr. Hayden seconded the motion. It was approved unanimously.

KQ8B. How safe and effective are topical antiseptic products individually and in combination?

The 1999 Guideline states to “use an appropriate antiseptic agent for skin preparation (**Category IB**) and to apply preoperative antiseptic skin preparation in concentric circles moving toward the periphery. The prepared area must be large enough to extend the incision or create new incisions or drain sites, if necessary. (**Category II**)” The Federal Register Draft Recommendation is: “8B. Perform intraoperative skin preparation with an alcohol-based antiseptic agent, unless contraindicated. (**Category IA**)”

The recommendation was based on a variety of studies that showed no benefit of aqueous iodophor as compared to iodophor in alcohol in five RCTs; an association of chlorhexidine gluconate (CHG)-alcohol with reduced risk for SSI as compared to aqueous iodophor in five RCTs; and five RCTs showing no benefit of CHG-alcohol as compared to aqueous iodophor in alcohol. Public comment indicated that the evidence does not support a Category IA recommendation. Additional comments suggested rewording, mentioned the exclusion of aqueous iodophor, and noted that the referenced studies did not incorporate SSI as the outcome. HICPAC proposed an updated literature search and a revision and addition to the 1999 recommendation:

- “Perform intraoperative skin preparation with an appropriate antiseptic agent. **(Category IB)**
- “No recommendation can be made regarding the safety and effectiveness of specific intraoperative skin preparation antiseptic agent(s) for the prevention of surgical site infection. **(No recommendation/unresolved issue)**”

The literature search yielded one new RCT. The study compared CHG-alcohol to aqueous iodophor in alcohol and showed no difference: there were zero infections in both arms of the study. The new study does not address the key question of whether to use alcohol or not, as alcohol was included in both arms of the study.

### Discussion Points

There was discussion regarding use of the phrase “unless contraindicated.” The specific concern regarding this recommendation concerns use around hair or in other situations that could pose a surgical fire risk when using an alcohol-based product.

Dr. Tapper moved to maintain the current *Federal Register* recommendation. Dr. Rogers seconded the motion. It carried unanimously.

KQ8C. How safe and effective is the application of an antimicrobial sealant immediately following intraoperative skin preparation?

No recommendation was made in 1999 on this issue. The *Federal Register* Draft Recommendation reads: “8C. Application of an antimicrobial sealant immediately following intraoperative skin preparation is not necessary for the prevention of surgical site infection. **(Category II)**” The recommendation was based on a meta-analysis of four RCTs that showed no benefit of cyanoacrylate-based antimicrobial skin sealant applied immediately following skin preparation. Public comment addressed the level of evidence supporting the recommendation and suggested changing “antimicrobial sealants” to “microbial sealants.” HICPAC requested an updated literature search and consideration of wording and evidence category modifications. The updated literature search yielded one additional RCT that also showed no benefit of utilizing sealant, and it did not change the outcome of the meta-analysis.

### Discussion Points

Dr. Fishman noted general agreement among HICPAC for using the term “microbial sealants.” He asked for discussion regarding whether the level of evidence should be classified as Category II or Category IB.

Dr. Bratzler reminded HICPAC that five RCTs showed no difference. The total sample size was 665 patients.

The level should be “no recommendation” if the studies show no harm and no benefit. The RCTs show no benefit; the question is whether their sample size would change the point estimate over time. Many of the surgeries in the studies tend to have low SSI rates. There is evidence suggesting no benefit, but the sample size is small, which may have led to the Category II recommendation. Future data could change the conclusions.



There have been concerns regarding flaking of the sealant to the wound. These concerns are being investigated by the US Food and Drug Administration (FDA) as a cause of harm.

Dr. Huang moved to change the wording to “microbial sealant,” leave the recommendation as written otherwise, and assign Category II to the recommendation. Dr. Diekema seconded the motion. It carried unanimously.

Dr. Bratzler acknowledged the SSI Writing Group, particularly the contributions of Erin Stone. Dr. Fishman said that specific wording for the antimicrobial sutures would be reviewed the next day, and HICPAC has requested additional data regarding mechanical bowel preparation versus mechanical bowel preparation with oral antibiotics.

Dr. Tapper commented on an ongoing controversy regarding patient warming. The Hospital Infection Society (HIS) recently published concerns about forced air warming versus other approaches to patient warming.

Dr. Bratzler said that the Draft *Federal Register* Guidelines recommend keeping patients warm but do not recommend a methodology.

## Public Comments

**Dr. Martin Weisberg**  
**Ethicon, Inc.**

Regarding antimicrobial sutures, Dr. Weisberg spoke from his 30 years of experience as a surgeon as well as his experience as Medical Director at Ethicon. It is extremely difficult to design and execute studies on antimicrobial sutures due to the overwhelming risk factors for SSIs. Controlling for the risk factors is nearly impossible. Suture is a foreign body, and the presence of suture can potentiate an infection. In the laboratory, coating a suture with triclosan prevents colonization, increased growth, and biofilms of some bacteria, effectively addressing the risk introduced by the suture. As a surgeon, eliminating any risk factor is worth an increase in cost. Approximately one-third of all surgeons use antimicrobial-coated sutures. It is not clear whether the sutures will save a percentage of lives, but they must do some good.

## Liaison / Ex officio Reports

**APIC:** APIC has spent a great deal of time with Ebola preparedness, partnering with CDC and Johns Hopkins on the PPE videos. APIC is updating the implementation guide for hand hygiene, Central Line-Associated Bloodstream Infection (CLABSI), and construction for infection prevention, with a planned release date of 2015. APIC has been involved in a great deal of legislative activities, including comments with CMS regarding end-stage renal disease.



**America's Essential Hospitals:** America's Essential Hospitals' hospital engagement network has been working to align with the goals of reducing HAIs by 40% and preventable readmissions by 20%. The network fills a safety role in the hospitals' communities and serves as a link to the national quality improvement structure. From baseline to June 2014, the hospitals reporting data to the network show a 53% reduction in CLABSI; 33% reduction in Catheter-Associated Urinary Tract Infection (CAUTI), and 9% reduction in SSIs.

**Public Health Agency of Canada (PHAC):** PHAC's primary activities have been immersed in Ebola-related work on the national and international levels. PHAC's national microbiology laboratory has been involved in vaccine development, research, and staff deployment. They have experienced similar and parallel challenges to the challenges in the US. PHAC works closely with many groups involved in mobilization and deployment to assist with the outbreak, and there has been significant interest in Canadian assistance because of the need for bilingual skills. PHAC has been involved with guidance development, which has been challenging due to rapid changes and due to the need to achieve agreement and translation from Canada's 13 provinces. The guidance for healthcare workers and facilities has been revised again and will be posted soon. PHAC resulted from SARS, which yielded good lessons learned in terms of preparedness and response. Having close linkages at the working level with CDC and other partners has brought opportunities to share information regarding infection control and enhanced border measures, especially when there have been surprises. Infection control has come to a higher level on the national health agenda, and their challenge is to keep it at that level. Some of PHAC's guidelines regarding HAIs have been put on hold, but key activities regarding AMR have moved forward. Work on antibiotic stewardship is progressing. PHAC co-hosted a national infection prevention control summit with a group focused on patient safety.

**CSTE:** CSTE has an HAI Committee with a Surveillance Standards Subcommittee. Their main instrument is position statements. They are interested in learning uptake of the statements, including how they drive policy, use of resources, and planning at the state level. CSTE is planning a survey of state and large city HAI programs to determine how the position statements are being used to gauge their effect and to learn how better to promote them. A statement is in the pipeline regarding Carbapenem-Resistant Enterobacteriaceae (CRE), as states have different approaches to surveillance. CSTE is considering a long-term care facility statement. It is critical to provide guidance on long-term care issues beyond the hospital. A Drug Diversion Workgroup has been created. CSTE is working closely with CDC on the next annual HAI Report. CDC has been very responsive as they have worked to find ways to communicate this complicated information to the public and to healthcare providers so that data can be used for action and to guide prevention activities. These report cards are used around the country, often by policymakers, and can be a tool for support.

**SHEA:** Work has been ongoing in Ebola, and SHEA has been able to make progress in other areas as well. SHEA's Primer on Healthcare Epidemiology, Infection Control, and Stewardship will be released online in early 2015. It has been endorsed by IDSA and the Pediatric Infectious Diseases Society (PIDS). SHEA will conduct an educational course in early February 2015 response to a California state bill requiring hospitals to have a stewardship program. The SHEA spring meeting will be held in Orlando, Florida in May 2015. Expert guidance papers are forthcoming on animals in healthcare facilities and isolation practices.

**IDSA:** Ebola has been a major focus area for IDSA. Work is also going on antimicrobial stewardship. The US Stakeholder Forum on Antimicrobial Resistance (SFAR) took place in Philadelphia, Pennsylvania in October 2014. Work is ongoing on updating a number of guidelines and guidance, many of which focus on HAIs and infection prevention.

**Association of periOperative Registered Nurses (AORN):** Ebola has been a focus area of AORN as well. AORN released guidance regarding emergency procedures and sterile processing for instruments, including laryngoscope blades and handles. AORN is changing the title of its “Recommended Practices” to “Guidelines for PeriOperative Practice.” The quality of the documents reflects the definition of a clinical practice guidelines and acceptance into the National Guideline Clearinghouse (NGC). AORN’s guidelines for skin anesepsis and tissue management were approved by NGC. The new document in 2015 will include eight guidelines. The AORN conference will be held in March 2015.

**Surgical Infection Society (SIS):** SIS has worked with American College of Surgeons (ACS) to develop recommendations regarding what surgeons might encounter with Ebola, a gastrointestinal illness. The discussion regarding Ebola at the SIS Council meeting in Fall 2014 segued into a larger discussion about global surgery. Many medium- to low-resource areas now have access to technologies and tools, such as antimicrobials, to which they have not previously had access. They seek partners to work with them in infection prevention, specifically regarding surgical procedures in parts of the world with improving resource availability. This area is promising for SIS.

**Society of Critical Care Medicine (SCCM):** SCCM was one of the formally endorsing societies for the Compendium of Strategies to Prevent HAIs. It is clear that management of sedation is important for prevention of Ventilator-Associated Events (VAEs). SCCM is funding a 45-center collaborative to help roll out its guidelines for sedation management. Regarding CAUTI, SCCM has joined with the American Heart Association (AHA), the Agency for Healthcare Research and Quality (AHRQ), and the Society of Hospital Medicine (SHM) on a collaborative. Regarding detection and early treatment of hospital-acquired sepsis outside the ICU, SCCM has partnered with SHM and the Gordon and Betty Moore Foundation to create a 54-hospital collaborative for early detection of sepsis on the ward. SCCM has begun the next revision of the “Surviving Sepsis” Guideline. There have been many developments in the literature on this topic. SCCM is also working on a revision of the definition of sepsis with several partners.

**CMS:** CMS works with CDC on many issues related to HAI and infection control. Their emphasis has been on reducing HAIs and how they relate to value-based purchasing and payment incentives for hospitals. The structure of the Quality Improvement Organization (QIO) contract has changed to a five-year contract, and the priority of reducing HAIs has remained. CMS is active in promoting antibiotic stewardship programs. A new regulation in 2015 will require hospitals to have these programs. CMS has released several certification letters, three on Ebola and two communicating CDC guidelines to hospitals on Emergency Medical Treatment and Labor Act (EMTALA) regulations. Other letters clarify policy regarding immediate-use steam sterilization policy and reporting breaches in infection control for further investigation. CMS just released the revised hospital surveyor infection control tool. The document is not structurally different from before, but the wording of some questions has changed. The document provides transparency for hospitals to understand how to comply with CMS regulations and can serve as a strong self-assessment tool for hospitals.

**AHRQ:** The CDC recommendations for mild dengue fever recommend acetaminophen and cool compresses to prevent febrile seizures. AHRQ conducted a literature review for evidence to support this practice for this purpose, and there is not. Of greater concern is the practice of local cooling, because in retrospect, smallpox was probably a skin disease, and local cooling may have caused more severe disease because the virus is temperature-sensitive. It is proposed to create a website to share ceiling temperatures for replication of viruses.

**VA:** The VA's emphasis for 2015 will be "results." CDC has extended the definition of *Legionella* disease, which may result in more cases. It is a preventable disease with high death rates in hospitalized patients and will be a VA priority. VA is also focusing on how to prevent HAIs by modifying the built environment: air, water, and materiel. This opportunity is beginning to gain traction and does not depend on an individual person. The VA antibiotic stewardship program is moving ahead. Decreased antibiotic use in VA hospitals across the country has been demonstrated. The VA continues specific efforts in MRSA, *C. difficile*, and CRE. CRE is difficult in the laboratory and in practice, particularly regarding active surveillance.

**DNV GL Healthcare Accreditation:** DNV GL has provided accreditation and certification services to over 400 hospitals. The opportunity to achieve certification aligns with published standards based on international guidelines. Hospitals have committed interest in decreasing HAIs and mitigating risks. Two hospitals recently achieved certification, and approximately 40 hospitals are in the queue.

**ASTHO:** In addition to working on Ebola, ASTHO is developing a web-based tool kit to help health departments access EHRs for HAI outbreak investigations. ASTHO is also developing a report on current state activities in antimicrobial stewardship to be released in early 2015. ASTHO convened a meeting between state health officials, state agricultural officials, and CDC on November 12, 2014, on the issue of AMR and stewardship. ASTHO is a member of SFAR. In July 2014, ASTHO released a position statement on AMR and stewardship. ASTHO continues to support state health departments regarding HAI-related policies and initiatives.

**National Association of County and City Health Officials (NACCHO):** NACCHO's Ebola activities focused on providing information and technical assistance to local health departments and providing feedback to CDC regarding the EOC and the draft interim guidance for hospital preparedness. NACCHO participated in SFAR and is planning a tabletop exercise addressing communicable disease outbreaks in outpatient settings with the Milwaukee Health Department and CDC. NACCHO is developing HAI prevention guidance documents for local health departments.

**ACS:** No report.

**NIH:** *NEJM* recently published an important report about one of the candidate Ebola vaccines, which proves to be successfully immunogenic in 20 normal volunteers. A Phase II/III trial is likely to be initiated quickly in western Africa. The vaccine was developed at NIH and is being produced in collaboration with Glaxo Smith Kline. It is based on a chimpanzee adenovirus vector. Additionally, NIH continues studies on the genomics of Vancomycin-Resistant *Enterococcus faecium* (VRE) and CRE.

The meeting stood adjourned at 5:03 pm.

## December 5, 2014

The second day of the meeting of the Healthcare Infection Control Practices Advisory Committee was called to order at 9:08 am on Friday, December 5, 2014. A roll call was conducted to establish quorum. HICPAC members declared conflicts of interest.

## Update on Global Health Security Antimicrobial Resistance Issues

Jean B. Patel, PhD, D(ABMM)  
Office of Antimicrobial Resistance  
DHQP/NCEZID

The Global Health Security Agenda (GHSa) is meant to broaden the global infrastructure to respond to an emerging infectious disease threat. CDC's role in the GHSa is to partner with international agencies to accelerate progress toward a world safe and secure from infectious diseases and to prevent and reduce the likelihood of outbreaks (natural, accidental, or intentional); detect threats early to save lives; and respond rapidly and effectively using multi-sectorial, international coordination and communication.

The GHSa has nine objectives that span the range of activities necessary to respond to infectious disease threats. One of the objectives focuses on AMR. Each objective in the GHSa incorporates an Action Package. The AMR Action Package is to:

- Develop a national action plan
- Develop and implement guidelines and standards for infection prevention
- Promote the prudent use of antimicrobials in both humans and animals
- Ensure access to at least one reference laboratory for each country that is capable of identifying or detecting critical AMR pathogens
- Develop and implement a harmonized approach for the monitoring and surveillance of antimicrobial drug use and AMR

CDC's initial activity, conducted through WHO, has been to develop a harmonized approach for monitoring AMR. The first proposed standards for AMR surveillance were rolled out to 30 member countries at a meeting in December 2014. The countries weighed in on the standards and on their ability to participate in global surveillance to meet them.

The overall objective of the global surveillance program is not only to produce global and national figures, but also to result in the strengthening of national surveillance that can be used for prevention measures. To that end, the objectives are to: collect, analyze, and report data with standardized definitions of infection and AMR; estimate the extent of AMR infections; detect new resistance; and provide critical data for AMR prevention measures.

The first global surveillance report was released in 2013. A number of deficiencies were identified in the data that could be collected globally. No data were collected in some areas, and in other areas the data were not optimal because they came from academic reports as opposed to a public health entity, were not standardized, or were not representative of the population. The standards developed for future reports address these issues.

The proposed surveillance focuses on diseases or infections. Rather than focusing only on tracking bacteria, it will measure the number of infections that are occurring. Four infections were identified for the initial implementation phase of the surveillance:

- Bloodstream Infections (BSIs): A serious infection with easily implemented definitions. Culturing is easy to implement in hospitals. A minimal amount of laboratory work is performed to support patient care. It is an opportunity to focus on AMR associated with healthcare-associated infection.
- Urinary Tract Infections: A common infection that is easy to culture in a hospital laboratory. An opportunity to capture community and hospital AMR. An opportunity to identify AMR that might not be detected in BSI surveillance.
- Diarrhoea: Will focus on salmonella and shigella, two pathogens that can be transmitted from animal and food sources to humans.
- Gonorrhoea: Expanding existing surveillance to new countries.

Tuberculosis (TB) was discussed during the meeting. It was concluded that global surveillance for drug-resistant TB is robust, and including it in the GHSA initiative might hinder that program.

One of the primary objectives of global surveillance is to promote diagnostic stewardship, the use of microbiological laboratory diagnostics to identify pathogens and to guide therapeutic decisions. In most of the world, cultures are not part routine care. They might only be ordered for a patient who is extremely sick and who has failed multiple care and treatment regimens. Another goal is to promote quality laboratory standards, which will be identified. The standards will include data, participation, and a quality management system to include external proficiency testing.

The identified pathogens for the surveillance agenda are:

- Enterobacteriaceae resistant to carbapenems, extended-spectrum beta-lactamases, and fluoroquinolones. Focus is placed on *Escherichia coli* (*E.coli*) and *Klebsiella pneumoniae*. They are common Enterobacteriaceae that have demonstrated a propensity for collecting AMR determinants and becoming resistant. Additional pathogens of interest are salmonella and shigella.
- *Neisseria gonorrhoeae* resistant to aminoglycosides, extended-spectrum cephalosporins, fluoroquinolones and macrolides.
- *Staphylococcus aureus* resistant to methicillin.
- *Streptococcus pneumoniae* resistant to penicillin.

Concern was expressed at the meeting that the surveillance would not be optimal for identifying resistance in *Streptococcus pneumoniae* because respiratory specimens were not included as a source for identifying infection. The WHO technical group acknowledged this issue, which should be addressed as part of a second implementation phase.

There was discussion regarding the metrics that should be used to report the surveillance data that are collected. Many countries that conduct surveillance focus on bacteria and report a percent resistance where the denominator is the number of resistant bacteria divided by the number of bacteria. A more robust metric that is still feasible is needed. For all save the bloodstream infections, there will be a percent resistance or non-susceptible metric, with the numerator as the number of patients infected and the denominator as the number of patients infected with the same organism. This metric could over-estimate resistance if only the sickest patients are cultured, which is the common international practice, but the impact of culturing practices will be understood with the reporting of aggregated data to include the total number of cultures performed.

The BSI surveillance will utilize a healthcare-associated metric, the number of hospital admissions for reported infections. There are requests for this level of aggregated data. This metric is commonly used in the US and Europe, but is new elsewhere and will lead to the need to report more aggregated data to the surveillance program.

There are requests for minimal epidemiological data at the national level for each of the collected infections:

- Pathogen identification
- Susceptibility data
- Patient unique identifier
- Patient gender
- Patient date of birth
- Date and site of specimen collection
- Date of hospitalization, if applicable

The National Framework within a nation begins with the Minister of Health identifying a national coordinating body to coordinate surveillance activities. This body will include a national reference laboratory, which is an element of the GHSA Action Package. The body is responsible for collecting data from front-line laboratories. These laboratories are primarily in healthcare, but the framework may also reach down into community sentinel laboratories and public health laboratories with data on foodborne infections and sexually transmitted infections.

The national efforts will tie into existing WHO surveillance programs for the Department of Agriculture as well as programs that have been identified for the World Organisation for Animal Health (OIE) and the Food and Agriculture Organization of the United Nations (FAO), which monitor animal health and food safety. All data that is submitted to the WHO Global Report should be submitted through the Minister of Health. Data for the first Global Report often came through academic institutions and were not presented to the Minister of Health. It is important for Ministers of Health to understand the level of resistance in their countries and to take responsibility for responding to the resistance.

The flow of data in the Global Framework begins with local-level, patient-level data collection from hospital laboratories. That data is transmitted to the national program, which is responsible for analyzing the data for national use and for aggregating the data for submission to the appropriate Regional Office of WHO.

Concern was expressed that the standards, as described, are very limited. Some countries are doing more surveillance than is outlined in the standards, and some individual hospitals are doing surveillance that is sufficient to generate an antibiogram for the hospital. If WHO identifies a limited surveillance program, there is concern that this good work may be undone. It is important, therefore, to ensure that these programs understand that the WHO standards are not meant to inhibit ongoing efforts.

The standards were developed by an international technical working group from WHO, relying heavily on experts from the WHO Regional Offices and Collaborating Centers. The 30 member countries attending the recent meeting were asked to buy into the program, and the response was positive. The number of countries that have available data that meet these standards is limited, so additional capacity-building is needed.

## Discussion Points

The only information being requested that will help differentiate between a hospital-onset infection and a community-onset infection is the data regarding whether the patient is hospitalized at the time that the specimen is taken. The limitation of this data in distinguishing the infections is understood. There were concerns that if the initial set of standards required chart reviews, then the effort would not secure buy-in. The initial set of standards already represent a major divergence from what currently transpires, so the working group sought to limit the amount of epidemiological data required on a laboratory submission form.

HICPAC asked whether the data include the time that the culture was obtained. Some surveillance uses that timing as a rough surrogate. That information can be available from laboratory information systems without a chart review. Dr. Patel said that such a surrogate could be applied to the data requirements in the first set of the standards.

HICPAC asked whether WHO has a budget for funding the development of national reference laboratories to gather and test these isolates. Dr. Patel answered that the GHSA is a commitment of funds from different countries to build capacity around the world and will be the source of funding for building the necessary capacity. WHO focuses on providing technical and scientific leadership and coordination.

There was discussion regarding the management and coordination structure and the possibility of ensuring that the person in charge of surveillance is in charge of the individuals providing the data. A national coordinating body could be established that has no “teeth” or effectiveness. WHO’s involvement will be beneficial in this area. The WHO Regional Offices have good relationships and will interact with the countries implementing this surveillance so that problems can be identified quickly.

This program could play a role in the early detection of newly-emerging, multi-drug resistant organisms. HICPAC asked how unusual phenotypes will be detected and how those organisms will either be banked for molecular analysis or linked to the Advanced Molecular Detection (AMD) Initiative or other means for further characterization. Dr. Patel replied that those ideas have been discussed, but specifics have not been developed. Early detection of AMR is an important activity within the surveillance network, but protocols are needed to identify trigger events, what would happen in response to those events, and how to communicate to all involved in the global surveillance program. The International Health Regulations (IHR) have been identified as a critical communication tool. The Latin American AMR Surveillance Network currently uses IHR mechanisms for reporting unusual resistance to other countries within the network. The national reference laboratory is intended to serve as a site for higher-level analysis for resistant pathogens. In many countries with a national reference laboratory, it is the only laboratory that conducts susceptibility testing. That testing should be driven to the hospital level, and the national laboratory should be used for higher characterization.

A more detailed protocol will be identified, but the intention is to collect all data for these pathogens into a common database with a process for de-duplicating. Countries are asked to identify as many hospital laboratories as possible that can report. In many countries, only a single hospital may be able to produce these data now. Those numbers will build in the future.



## National Healthcare Safety Network (NHSN) Updates

**Dawn Sievert, PhD, MS**  
**Acting Deputy Branch Chief, Surveillance Branch**  
**Lead, Change Control Board**  
**Division of Healthcare Quality Promotion**  
**National Center for Emerging and Zoonotic Infectious Diseases**  
**Centers for Disease Control and Prevention**

Dr. Sievert reviewed the changes planned for January 2015 for the National Healthcare Safety Network (NHSN). Indications for these and future changes have been provided via newsletter; emails are sent to network members; and frequent updates of the NHSN website.

A number of changes are planned for NHSN in 2015. There has been a strong expansion of NHSN use in recent years due to CMS's quality improvement programs and state reporting mandates. The addition of a variety of users and data has allowed for examination of the system internally and with external partners. CDC has been collecting feedback and reviewing the system, including the criteria, definitions, business rules, and algorithms, to make improvements. This work will result in important revisions and enhancements to produce new benefits for patient and healthcare worker safety. The changes are intended to:

- Organize, update, simplify, and align criteria and definitions
- Decrease subjectivity
- Improve ease of data collection and entry
- Maintain epidemiologic standardization and clinical relevance
- Increase the potential for more purely electronic data capture
- Facilitate a new baseline year
- Deliver a reliable source of high-quality data for analysis and action at facility, local, state, and national levels

These changes are being made now so that the system will remain stable and steady for at least the next three to five years. The next goal is to move toward full electronic capture with more electronic determination, removing the burden on individuals. 2015 will provide baseline data for calculating the Standardized Infection Ratios (SIRs) for 2016 and subsequent years. SIRs will still be created with 2015 data for CMS purposes and will be based on old baseline data by quarter. When all of the 2015 data are complete, they will be analyzed to make decisions about risk adjustment and new variables.

Changes planned in the definitions that are foundations for HAIs are:

- Infection Window Period: Seven-day period in which all site-specific infection criterion must be met. The three days before and after the first positive diagnostic test.
- Date of Event: Date of the first element used to meet the site-specific infection criterion within the seven-day infection window period.
- Present on Admission (POA) Infections: Date of event on day of admission or the two days before or one day after.

- HAIs: Date of event on day three of admission or after.
- Repeat Infection Timeframe (RIT): Fourteen-day period during which no new infections of the same type will be reported, date of event = day one.

These changes remove subjectivity and add time stamps. No system is perfect, and there has been discussion regarding variations of this approach for some time. It is important that the measures are carefully coordinated to remain clinically relevant and to remove subjectivity.

Determining secondary BSIs is an important part of NHSN reporting. In order to be secondary to another infection, the positive blood culture must be collected including the Infection Window Period and/or the RIT of the primary site infection, which is 14 to 17 days, depending on the date of the event. The pathogen must match at least one organism found in a primary site infection culture, or the positive blood culture is an element used to meet the primary site infection.

Changes slated for SSIs are:

- Infection Present at Time of Surgery (PATOS): An infection is present at the start of or during the index surgical procedure. It is documented preoperatively or it is found intraoperatively and documented in the patient chart. A variable of analysis will be added so that surgeons are not “dinged” for PATOS.
- Revision Associated with Prior Infection at Index Joint: Defined by the presence of a specific list of International Classification of Diseases (ICD)-9 diagnosis or procedure codes associated with the index Hip Prosthesis (HPRO) or Knee Prosthesis (KPRO) procedure.
- Diabetes: Feedback from users asked for more accurate and easy completion of this variable. In addition to the current NHSN definition, discharge ICD-9 codes in the 250 to 250.93 range will also be acceptable.
- Transition to ICD-10- Clinical Modification/Procedure Coding System (CM/PCS) and Current Procedural Terminology (CPT) Codes: Changes are slated for October 1, 2015. The updated ICD-10-CM/PCS and CPT maps to all NHSN operative procedure categories for SSI surveillance are planned for March 2015. The codes will not be built into the NHSN system until the January 2016 and will be cross-walked in the final quarter of 2015.

Changes regarding VAEs are:

- The third tier of the VAE algorithm will be collapsed to include one specific event: Possible ventilator-associated pneumonia (PVAP), which replaces possible and probable ventilator-associated pneumonia (VAP). The intention had been to analyze the two together.
- Community-associated fungal pathogens that are rarely or not causal to HAIs are no longer available for meeting the PVAP definition.
- Exception for determining the daily minimum positive end-expiratory pressure (PEEP)/Fraction of Inspired Oxygen (FiO2): When there is no value documented to have been maintained for at least one hour during a calendar day, choose the lowest value.
- Episodes of Mechanical Ventilation (EMV) introduced as a new optional denominator.

Regarding Pneumonia/VAP, purulent sputum will require laboratory confirmation and is defined as secretions from the lungs, bronchi, or trachea that contain >25 neutrophils and <10 squamous epithelial cells per low power field (x100). The pathogen exclusions for pneumonia /VAP will mirror VAE.

Changes planned regarding Urinary Tract Infections (UTIs) are:

- 100,000 colony-forming units (CFU) per milliliter will be the threshold for NHSN UTI criteria.
- All non-bacteria, including yeasts, are no longer eligible pathogens for Symptomatic Urinary Tract Infection (SUTI) or Asymptomatic Bacteremic Urinary Tract Infection (ABUTI).
- The ABUTI pathogen list will no longer be used.
- Urinalysis will not be used for any NHSN UTI criteria.
- Dysuria will not be used for UTI definition in patients less than or equal to one year of age.
- Fever will now be allowed for non-catheterized ABUTI in patients over the age of 65 years.
- Core temperatures will no longer be required. Temperatures will be reported to NHSN as they are documented in the medical record. This change applies to all infections and standardizes the system as well as alleviates burdens on the users.

Changes are slated for MDRO/ *Clostridium difficile* Infection (CDI) LabID Events are:

- Facility-wide inpatient (FacWideIN) reporting for acute care must exclude and indicate removal of denominator counts for Inpatient Rehabilitation Facility (IRF) and Inpatient Psychiatric Facility (IPF) units with unique CMS Certification Numbers (CCNs). This change helps prevent data from being double-counted, such as when the IRFs also report MRSA and *C. difficile*.
- FacWideIN reporting now also requires unit-specific reporting for the same organism from all ED and 24-hour observation units within a facility. This change will help collect community-onset cases more accurately when patients are not admitted.

Changes to and expansion of CRE surveillance definition and reporting are:

- Added CRE-Enterobacter to CRE-Klebsiella (pneumoniae and oxytoca) and CRE-*E. coli* with the requirement to track all three.
- Added ertapenem to imipenem, meropenem, and doripenem.
- Reporting only if “resistant” to a carbapenem, not “intermediate.”
- Specifications for acceptable Minimum Inhibitory Concentration (MIC) values, carbapenemase production, and tests used.
- Two optional questions have been added to track patients through the continuum of care, including prior to admission and readmission:
  - With a community-onset LabID event, where did the patient spend the previous night?
  - If a patient is discharged and readmitted and there is another event, was the patient discharged in the previous four weeks, and were they in another facility within those four weeks?

Additional revisions to the NHSN application include:

- The primary site infection HAI definitions in Chapter 17 have been updated to reflect current diagnostic tests and procedures and the likelihood of a secondary BSI.

- The denominator reporting for CLABSI / CAUTI device days has been simplified. There is a new alternative method of once-weekly denominator counting for facility units with 75 device days or more per month.
- Adherence to the Central Line Insertion Practices (CLIP) bundle is being changed to allow for bundle adherence if the patient is less than 120 days old and contraindication to CHG is marked “Yes.”
- Annual Surveys for Acute Care Hospitals (ACHs), Long-Term Acute Care (LTAC) facilities, IRFs, and Long-Term Care Facilities (LTCFs) are being updated and will include two new sections of questions on Infection Control Practices and Antibiotic Stewardship Practices.
- IPFs will have the ability to set up appropriately with their own CCNs within the application.
- Facility Information: Add CCN Effective Date for more accurate tracking.
- Changes and updates to Output Options reports and datasets include TAP reports for CLABSI, CAUTI, and CDI LabID. This information will rank facilities according to the highest excess number of infections so that efforts can be targeted within facilities for improvement and prevention.
- Updates are made to all relevant Clinical Document Architecture (CDA) Implementation Guides to equate electronic reporting with manual data submission. A CDA pre-production test site has been created for vendors so that they can test their codes before they “go live” and eliminate glitches before the release date.
- The Dialysis Component of NHSN was released in July 2014. The addition went smoothly and some changes are planned:
  - The new question, “Where was this positive blood culture collected?” has been added.
  - The outcome: “Loss of vascular access” is now a required field.
  - Five new prevention process measures have been added to track audit results.
  - The ability to monitor influenza vaccinations for dialysis patients is added.
  - New data quality reports are included in the analysis.
  - Changes have been made to the annual survey.

### **Discussion Points**

HICPAC observed that the overall NHSN effort is to move toward objective, discrete data collection, but PATOS could still be subjective. There was an inquiry about long-term plans for making the PATOS collection more discrete. Dr. Sievert agreed that the long-term goal is to be more objective, but there is not a timeline for it. If the requirements are too stringent, then they will “have to back off.” She agreed that more codes are needed for PATOS.

Regarding the once-weekly sampling strategy for the denominator for CLABSI / CAUTI device days, a great deal of effort is made to ensure that the numerator is as accurate, reliable, and discrete as possible; however, if weekly sampling is allowed for the denominator, it is likely to be manual. HICPAC asked about movement toward electronic determination so that the denominator will be as precise as the numerator. Dr. Sievert said that the change to weekly sampling removes some burden, as many facilities still sample manually. Electronic reporting will not require sampling, as the electronic flow is open. The goal is to allow the weekly sampling until electronic reporting is achieved and sampling will no longer be needed.

Regarding the release of the Chapter 17 update, there are a number of electronic algorithms to assist with determinations regarding BSIs, and Chapter 17 is a long document. HICPAC hoped that it would be released with a

“tracked changes” version to help facilities update their information and electronic surveillance. Dr. Sievert answered that the chapter will be released by Friday, December 12, 2014. It will be announced via email and other communication methods. The NHSN team hopes that users who input information manually will not focus on the changes, but will use the new definitions. For electronic users, all tracked changes are kept, and they can work with their CDA colleagues and share code changes that will be relevant for vendors.

Regarding PATOS, the definition is specific to the level of the original infection. This aspect of the definition is concerning to some colon surgeons, for example, who perform surgery on patients who are at high risk for infection. There was discussion regarding a rationale for not marking a deep or superficial SSI as PATOS. The definition of PATOS was coordinated with ACS, which deemed it appropriate. The risk attributed to those surgeries will be higher because they have a dirty, infected wound. Introducing PATOS will not remove the risk modeling. The issue is made more complicated because SSIs can be prevented by delaying closure, but there is controversy regarding delay. Dirty procedures are high-risk, and the incisions should be monitored. There are challenges associated with wide variation in documentation ability.

HICPAC congratulated the NHSN group for working to modify the definitions and ensure that they are credible.

There was discussion regarding the status of the mucosal barrier injury (MBI) component of the CLABSI definition. Dr. Sievert answered that MBI will be removed with PATOS and will be removed when the data are re-baselined in 2015. When the SIR is produced in 2015, the MBIs will not be excluded because the re-baselining needs to occur first. Subsequent to the re-baseline, they will not be included and will be reported separately in NHSN. Because time and resources are spent by surveillance nurses to capture and record those events, HICPAC encouraged that if they are not being reported and acted on, then they should not be included in the data. The rationale is that MBIs are generally non-preventable events. If they are included and analyzed with actionable CLABSIs, it is more important to spend time and resources on events that can be acted on and prevented. Dr. Sievert clarified that NHSN will track MBI separately. They will be analyzed as part of the re-baseline in 2015, and adjustments can be made as needed. If MBIs will be reported to the states after January 2015, when they will no longer be reported to CMS, there could be different standards from state to state. The data will be in the system. States can remove the data and treat them as they desire. NHSN users will be able to run BSI reports and see MBIs separately. NHSN can issue guidance to states that if CLABSIs are reported, then MBIs should be removed.

HICPAC said that being able to track trends over time is very important. Regarding purulent sputum, HICPAC noted a numeric quantification of the number of neutrophils and asked about the possibility of a semi-quantitative definition, such as “many” or “few,” to alleviate burden on the laboratories.

Regarding the addition of *E. coli*, *Klebsiella*, and *Enterobacter* to the CRE definition, concern was expressed that a number of other Enterobacteriaceae will be discovered. Dr. Sievert answered that the organism must be searched in LabID Event. The Antimicrobial Use and Resistance (AUR) Module will collect all susceptibility data on all organisms. The addition to the CRE definition is an interim focus. The AUR module will allow users to focus on the organisms of greatest interest.

A great deal of time and complexity is involved in surveillance. Larger healthcare settings may have the resources for the surveillance, but many community hospitals struggle to keep up with the surveillance and to respond to the results. It is important to provide a high level of information regarding what is involved in a surveillance program so that hospital administrations understand what is needed to gather data and do not find themselves in a position where data are gathered, but it is not possible to do anything about it. Dr. Cardo agreed and said that

HICPAC's input will be vital as they move toward more electronic reporting. The future is likely not to rely on the traditional clinical base definitions, but to move toward indicators. The data are making a difference, but they should avoid a situation in which it is a burden.

State departments of public health need continued support to provide training and support for facilities.

Specimens sent to the microbiology laboratory are often mixed, and the laboratories often conclude "mixed flora." There was an inquiry regarding how attribution will occur for secondary infections. A blood culture is part of the definition for intra-abdominal abscess (IAB) for NHSN. If a patient has a blood culture and meets the other criteria, which are usually a positive image and one symptom, then it will be attributed as a secondary BSI. The blood culture alone does not meet the IAB criteria; the criteria include a blood culture plus a positive image and a symptom. Previously, there were four categories. With the new change, there are only two. Some definitions do not have blood culture as a criterion.

HICPAC noted the challenges that infection preventionists who do the front-line work of data collection and of implementing best practices face. HICPAC thanked CDC for providing details and information in Webinars that can be shared.

## **Business from Previous Day**

### **SSI Guidelines: Antimicrobial-Coated Sutures**

Dr. Fishman presented three statements regarding antimicrobial coated sutures for HICPAC's consideration:

*"Triclosan-coated sutures are recommended for deep/fascial closure in colorectal surgery. (Category IA)"*

Drs. Diekema and Talbot moved and seconded, respectively, to accept the recommendation. The motion carried unanimously.

*"Tricolsan-coated sutures may be considered for deep/fascial closure for other surgical procedures. (Category II)"*

Dr. Babcock moved, and Dr. Talbot seconded, to accept the recommendation. The motion carried unanimously.

*"There is no evidence to support the use of triclosan-coated sutures for cutaneous enclosure or for the use of sutures coated or impregnated with antimicrobials other than triclosan for any type of closure to prevent SSIs. (Unresolved issue)"*

Dr. Talbot moved, and Dr. Babcock seconded, to accept the recommendation. The motion carried unanimously.

## SSI Guidelines: Oxygenation

Dr. Fishman said that HICPAC could consider recommending maintaining the use of increased fraction of expired oxygenation to prevent SSIs in elective colorectal surgery as a Category IA recommendation.

The recommendation is reasonable, but the narrative should include a clear discussion of why HICPAC reached different conclusions from recent meta-analyses. Dr. Talbot reviewed eight meta-analyses in this topic. Most of the procedures were abdominal. Five of them showed significance. One did not, but the upper limit of the confidence interval was one, and another that did not show significance was a heterogenous group including surgeries other than abdominal. The meta-analyses support the recommendation in elective colorectal surgery.

HICPAC acknowledged the difficulty in executing the recommendation, but felt that the data support the recommendation in elective colorectal surgery. Recommendation 6A will be modified accordingly, and 6B and 6C remain unchanged.

Dr. Fishman clarified the wording as: “no recommendation can be made regarding safety and effectiveness of administering perioperative increased fraction of inspired oxygen for the prevention of SSIs in patients undergoing either general anesthesia without endotracheal intubation or neuraxial anesthesia or surgical procedures other than elective colorectal surgery.”

Dr. Babcock moved, and Dr. Tapper seconded, to accept the recommendation. The motion carried unanimously.

## SSI Guidelines: AMP

Dr. Fishman said that the current guidelines include a recommendation for AMP as Category IA but make no recommendations pertaining to timing, redosing, or weight-based dosing. He suggested maintaining the recommendation for AMP and removing the “no recommendation” statements. The narrative will refer to the ASHP Guidelines and the Multi-Society Guideline regarding timing, redosing during surgery, and weight-based dosing.

The rationale for these changes is rooted in recognizing previous discussions regarding pathophysiology and pharmacokinetic. There are no RCTs available, but changing the language would be contrary to the language in the rest of the SSI Guidelines. Because the issues are being removed from SCIP, HICPAC was concerned about extinguishing benefit.

Dr. Babcock moved, and Dr. Talbot seconded, to accept the proposed changes. The motion carried unanimously.



## HICPAC Business

Mr. Hageman said that HICPAC's contributions to CDC are significant. Their input is extremely important as CDC and DHQP make decisions quickly. He noted that three HICPAC members would rotate off of the committee after this meeting. He thanked them for their valuable participation and looked forward to their continued input: Dr. Fishman, Dr. Hayden, and Ms. Carrico.

Drs. Bell and Cardo added their appreciation. Dr. Cardo noted that HICPAC's impact extends beyond releasing guidelines. The committee's and liaison members' discussions of definitions, stewardship, and other important issues move the agenda forward at CDC and in the field of healthcare epidemiology.

## Status Updates

### Neonatal Intensive Care Unit (NICU) Guideline

Mr. Hageman said that the public comments on the SSI Guideline prompted CDC to re-evaluate and update the literature search strategy of the Neonatal Intensive Care Unit (NICU) Guideline as well. The guideline focuses on specific areas: *C. difficile*, MRSA, CLASBI, and respiratory pathogens. The updated literature search is in progress. If the updated search leads to a need to change the recommendations, then HICPAC will be informed before the recommendations are submitted to the Federal Register for public comment.

### Endoscopic Retrograde Cholangiopancreatography (ERCP)

The July 2014 HICPAC meeting addressed issues associated with endoscopic retrograde cholangiopancreatography (ERCP). One of the Discussion Points focused on whether microbial culturing and surveillance should be conducted for scopes. Some international authorities recommend this practice. Work has been ongoing with international partners to better understand the impact of this strategy. Information will guide CDC's recommendations, as will consideration of costs and burdens associated with the practices. Discussions are taking place with FDA on this issue.

## CDC Laboratory Safety Update

**Dr. Michael Bell**  
**Division of Healthcare Quality Promotion**  
**National Center for Emerging and Zoonotic Infectious Diseases**  
**Centers for Disease Control and Prevention**

Dr. Bell became involved in laboratory safety at CDC beginning in July of 2014 after two high-profile incidents. Fortunately, neither case led to disastrous results, but they are examples of unacceptable outcomes that need to be addressed.

Laboratory safety is a large issue, and the work has benefited from the infection control perspective. The laboratory safety efforts have included consideration of the large laboratory system at CDC and understanding pieces of the system that can be adjusted and improved to improve safety. The incidents illustrated limitations in consistency and oversight. There are parallels between this work and infection control in healthcare. Both are large, multifaceted systems with underpinnings linked to human behavior.

CDC has grown from what was originally a small, boutique operation engaged in uncommon work to 1400 to 1500 laboratory staff and up to 1000 laboratories. CDC is now operating on an industrial scale and requires different approaches to uphold credibility and a track record of safety. CDC has a responsibility to the community where it is housed. Additionally, safety is a central element of industry because of its relationship to “the bottom line.” When CDC loses credibility, it can lose support.

Dr. Frieden established Dr. Bell as the interim point of accountability for laboratory safety at CDC. He also convened an external advisory group comprised of national and international biosafety experts from a range of backgrounds. There has been a great deal of laboratory staff engagement, including site visits and interviews to assess perceptions and needs of staff. Everyone wants to work safely, but there is a tendency not to adhere to a consistent standard of practice.

CDC’s mechanisms for laboratory staff recruitment are not systematic. Junior and mid-level staff are recruited one at a time either as direct hires or through training grants, not through a program. This approach has led to staff with their own methods who receive input from one Principal Investigator (PI). There has not been a “CDC Way” for biosafety and safe laboratory practice.

The desire and demand for more, better, and more consistent training is consistent across CDC laboratory staff. Training is bulky, cumbersome, and costly. It is a significant investment to maintain training. It may not be affordable to conduct training in-house in every case, but there is a strong drive to do so in certain cases. For instance, BSL-2 laboratories should operate with consistent practices and understandings. There should be a systematic approach to gaining access to BSL-3 laboratories, including demonstrating proficiency with certain basics, is important. Access to BSL-4 laboratories is extremely rigorously controlled and utilizes robust, one-on-one mentorship.

Suggestions for training include retrofitting an old BSL-4 laboratory to use as a training space. However, it could become overflow laboratory space and not be used for training. Discussions are ongoing to build a purpose-built structure for training in one of CDC’s holdings in Atlanta so that it will be less prone to absorption by other groups. CDC’s work in Haiti has demonstrated that it is possible to build modular laboratories inexpensively and quickly. There is still a need for laboratory-specific training, but this approach could bring personnel to a level of consistency and proficiency.

There is a significant difference between CDC’s research laboratories and its Clinical Laboratory Improvement Amendments (CLIA) laboratories. Laboratories that conduct clinical testing and must adhere to CLIA requirements are more consistent, with clear protocols and records. Similarly, CDC’s laboratories that produce reagents for public health laboratories adhere to good practices and are more organized and systematic than some of CDC’s

research laboratories. Research laboratories may do different kinds of work, but some protocols and steps should be systematic.

International Organization for Standardization (ISO) certification is under consideration. Several national federal laboratories have gone in this direction successfully. CDC is working with the American Association of Laboratory Accreditation (AALA) to certify some CDC laboratories for certain protocols that are consistently used. This approach will improve consistency and ensure robust, credible record-keeping and accountability.

CDC has a range of BSL-3 laboratories. Some are advanced in using technology for their systems, and others are keeping records by hand. The agency is shifting to a tablet-based system with time-stamped worksheets for consistent procedures. Every laboratory should have WiFi access and be integrated to improve speed and efficiency.

Other infrastructure issues are related to the systems that support safety in laboratories. Dr. Bell asked for data related to safety, and the only sources were injury and accident reports available through occupational health and the biosecurity Select Agents reports. Data are needed to prevent incidents, however. He noted that many of the agency's autoclaves had "out of order" signs. The autoclave maintenance staff reported that most of the outages are due to user error, particularly from overloading the autoclaves. The persons tasked with loading the autoclaves may need additional assistance. It is important to look at issues at the industrial, agency level, and to find solutions. Record-keeping is also critical to determine when the autoclaves break and how long they remain out of service.

Biosafety cabinets are critical to laboratory safety. The cabinets meet their annual certification, but more data are needed to ensure that they are working well. The cabinets have approximately a 15-year lifespan, so when laboratories are built and stocked, all of the equipment will need to be replaced at the same time. Plans need to be in place for re-investment to ensure institutional safety.

Air handling is another important issue. There must be record-keeping and communication regarding air handling alarms. This approach supports a culture of safety at an agency level and indicates that not only is it the scientists' responsibility to work safely at the bench and it is also the agency's responsibility to ensure that equipment works properly.

CDC is incorporating the idea of due diligence and accountability for safety up through the chain. To date, there has not been an element of performance measurement success for leadership about laboratory safety. Leadership should engage on safety in a non-punitive way. Laboratories have needs that may not be able to be addressed at the branch level, but they can be addressed at the division level. Requiring walk-throughs of laboratories by leadership to understand these issues is important for relationship-building.

Many good laboratory staff at CDC love their work, but there is not a clear career pathway for them, such as higher-level positions within branches. Creating this personnel structure will retain good personnel and highlight the importance of safety. Additionally, CDC will create a laboratory version of the Epidemic Intelligence Service (EIS), which is a systematic program for bringing people to the agency. EIS gives people backgrounds that they cannot learn anywhere else. CDC has a unique opportunity to train biosafety experts. This track does not exist anywhere else. There is also an opportunity to create a career track for individuals who want to be public health or reference laboratorians. Another track could focus on CDC's Masters-level laboratory staff who do not have a clear next step in their career progression.

CDC is considering expanding the role of the Institutional Biosafety Committee (IBC) to examine protocols more systematically. This new role can have impacts beyond safety and can improve efficiency and cost-effectiveness. The IBC can also open opportunities for junior scientists to participate. Considering more protocols and meeting more frequently provides means for informal mentoring.

### **Discussion Points**

Interesting results from considering systematic, reliable practice in laboratories that could apply in the clinical setting. There are a number of parallels to important issues in healthcare, such as the culture of safety and the need to be a high-reliability organization. Further, lessons learned from Ebola can be generalized. The issues of maintaining competency and combating complacency issues are also related.

There was discussion regarding communicating CDC's efforts and changes in response to the laboratory incidents. CDC's reputation was initially affected, and it may be important for the public to understand what CDC has done. The information could also be potentially transformative for the public health and medical systems. Dr. Bell said that there will be a revisitation of these issues, probably through the legislature. Clear lessons have been learned from state health laboratories, which are largely CLIA-driven. The culture is strong in some places and absent in others. Establishing the culture at CDC will provide a baseline setting for public health and research laboratories at academic institutions. Regarding medical care delivery, clinical laboratories are held to high standards; however, there are occasional mishaps and misunderstandings. As with infection control, safety is not a "one and done" activity. Efforts must be sustained and maintained in order to be effective.

There is a need and desire to research clinical laboratory data with research data. One of the roadblocks to this integration is the issue of standardization.

## **Summary and Wrap-Up**

**Neil Fishman, MD**  
**HICPAC Chair**

Dr. Fishman expressed his amazement with the impressive level of expertise and knowledge at HICPAC and among the liaison members. He said he was grateful and honored to have served as HICPAC chair. He encouraged CDC to continue to take advantage of the knowledge and expertise of HICPAC.

As there were no further questions or comments, Dr. Fishman adjourned the meeting at 11:38 am.

## Certification

I hereby certify that, to the best of my knowledge and ability, the foregoing minutes of the December 4-5, 2014, meeting of the Healthcare Infection Control Practices Advisory Committee, CDC are accurate and complete.

\_\_\_\_\_  
Date Neil Fishman, MD  
Chair, Healthcare Infection Control Practices  
Advisory Committee, CDC

## Attachment #1: Acronyms Used in this Document

Acronym	Expansion
AAAL	American Association of Laboratory Accreditation
AAOP	American Academy of Orthopedic Surgeons
AAP	American Association of Pediatrics
ABUTI	Asymptomatic Bacteremic Urinary Tract Infection
ACH	Acute Care Hospital
ACS	American College of Surgeons
AFP	Acute Flaccid Paralysis
AHA	American Hospital Association
AHRQ	Agency for Healthcare Research and Quality
AMD	Advanced Molecular Detection
AMP	Antimicrobial Prophylaxis
AMR	Antimicrobial Resistance
AORN	Association of periOperative Registered Nurses
APIC	Association of Professionals of Infection Control and Epidemiology
ASHP	American Society of Health-System Pharmacists
ASPR	(Office of the) Assistant Secretary for Preparedness and Response
ASTHO	Association of State and Territorial Health Officials
AUR	Antimicrobial Use and Resistance
BSI	Bloodstream Infection
BSL	Biosafety Level
C	Cocksackie
C. difficile	Clostridium difficile
CAUTI	Catheter-Associated Urinary Tract Infection
CCN	CMS Certification Number
CDA	Clinical Document Architecture
CDC	Centers for Disease Control and Prevention
CDI	Clostridium difficile Infection
CFU	Colony-Forming Unit
CHG	chlorhexidine gluconate
CLABSI	Central Line-Associated Bloodstream Infection
CLIA	Clinical Laboratory Improvement Amendments
CLIP	Central Line Insertion Practices
CM/PCS	Clinical Modification/Procedure Coding System
CMS	Centers for Medicare and Medicaid Services
CPT	Current Procedural Terminology
CRE	Carbapenem-Resistant Enterobacteriaceae
CSTE	Council of State and Territorial Epidemiologists
DFO	Designated Federal Official
DHQP	Division of Healthcare Quality Promotion
DoD	(United States) Department of Defense
E. coli	Escherichia coli
ED	Emergency Department
EHR	Electronic Health Record
EIS	Epidemic Intelligence Service

**HICPAC Meeting Summary Report**  
**December 4-5, 2014**

Acronym	Expansion
EMS	Emergency Medical Services
EMTALA	Emergency Medical Treatment and Labor Act
EMV	Episodes of Mechanical Ventilation
EOC	Emergency Operations Center
ERCP	Endoscopic retrograde cholangiopancreatography
EUA	Emergency Use Authorization
EV	Enterovirus
FacWideIN	Facility-Wide Inpatient
FAO	Food and Agriculture Organization of the United Nations
FDA	(United States) Food and Drug Administration
FiO2	Fraction of Inspired Oxygen
GHS	Global Health Security
GHSA	Global Health Security Agenda
GRADE	Grading of Recommendations Assessment, Development and Evaluation
HAI	Healthcare-Associated Infection
HHS	(United States Department of) Health and Human Services
HICPAC	Healthcare Infection Control Practices Advisory Committee
HIS	Hospital Infection Society
HPRO	Hip Prosthesis
IAB	Intra-Abdominal Abscess
IBC	Institutional Biosafety Committee
ICD	International Classification of Diseases
ICU	Intensive Care Unit
IDSA	Infectious Diseases Society of America
IHR	International Health Regulations
IPF	Inpatient Psychiatric Facility
IRF	Inpatient Rehabilitation Facility
ISO	International Organization for Standardization
IT	Information Technology
IV	Intravenous
KPRO	Knee Prosthesis
LRN	Laboratory Response Network
LTAC	Long-Term Acute Care
LTCF	Long-Term Care Facility
MBI	Mucosal Barrier Injury
MDRO	Multidrug-Resistant Organism
MERS-CoV	Middle East Respiratory Syndrome Coronavirus
MIC	Minimum Inhibitory Concentration
MMWR	Morbidity and Mortality Weekly Report
MoH	Ministry of Health
MRSA	Methicillin-resistant <i>Staphylococcus aureus</i>
NACCHO	National Association of County and City Health Officials
NCEZID	National Center for Emerging and Zoonotic Infectious Diseases
NEJM	New England Journal of Medicine
NESS	National Enterovirus Surveillance System
NGC	National Guideline Clearinghouse
NHSN	National Healthcare Safety Network



Acronym	Expansion
NICE	National Institute for Health and Care Excellence
NICU	Neonatal Intensive Care Unit
NIEHS	National Institute of Environmental Health Sciences
NIH	National Institutes of Health
NIOSH	National Institute for Occupational Safety and Health
NREVSS	National Respiratory and Enteric Virus Surveillance System
OIE	World Organisation for Animal Health
OSHA	Occupational Safety and Health Administration
PATOS	Present at Time of Surgery
PCR	Polymerase Chain Reaction
PEEP	Positive End-Expiratory Pressure
PHAC	Public Health Agency of Canada
PICU	Pediatric Intensive Care Unit
PIDS	Pediatric Infectious Diseases Society
POA	Present on Admission
PPE	Personal Protective Equipment
PUI	Patient Under Investigation
PVAP	Possible Ventilator-Associated Pneumonia
QIO	Quality Improvement Organization
RCT	Randomized Controlled Trial
REP	Rapid Ebola Preparedness
RIT	Repeat Infection Timeframe
SARS	Severe Acute Respiratory Syndrome
SCCM	Society of Critical Care Medicine
SCIP	Surgical Care Improvement Project
SFAR	United States Stakeholder Forum on Antimicrobial Resistance
SHEA	Society for Healthcare Epidemiology of America
SHM	Society of Hospital Medicine
SIR	Standardized Infection Ratio
SIS	Surgical Infection Society
SME	Subject Matter Expert
SSI	Surgical Site Infection
STS	Society of Thoracic Surgeons
SUTI	Symptomatic Urinary Tract Infection
TAP	Targeted Assessment for Prevention
TB	Tuberculosis
UAE	United Arab Emirates
UTI	Urinary Tract Infection
VA	(United States Department of) Veterans Affairs
VAE	Ventilator-Associated Event
VAP	Ventilator-Associated Pneumonia
VP	Viral Protein
VRE	Vancomycin-Resistant <i>Enterococcus faecium</i>
WHO	World Health Organization

## Attachment #2: Liaison Reports

### Liaison Report

HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)

Centers for Disease Control and Prevention

Meeting Date: December 2014

Meeting Location: Centers for Disease Control and Prevention, Atlanta, GA

Liaison name: Michael McElroy

Organization represented: America's Essential Hospitals

### Interim Activities and updates:

- In our comments to CMS on its proposed changes to the measures included in the hospital Value-Based Purchasing (VBP) program, America's Essential Hospitals strongly supported the CDC's development of the reliability-adjusted CLABSI measure. However, we urged CMS not to include the measure in the hospital VBP program until the NQF has endorsed the new measure and hospital have gained some experience reporting on it.

### Guidelines and Guidance:

Please include both in-progress and planned in the coming year. If you have a different format (e.g., information on a website) you don't have to list them here but could just include the link to the website.

n/a

### Position statements:

n/a

### Legislation:

n/a

### Campaigns and related activities:

- America's Essential Hospitals runs a Hospital Engagement Network as part of the Partnership for Patients (PfP). In our work through the Essential Hospitals Engagement Network (EHEN), America's Essential Hospitals staff members have visited all EHEN hospitals for site visits in the past 6 months to discuss best practices and interventions on healthcare-associated infections, along with the other PfP conditions. We also conducted a survey of clinical, leadership, and patient and family engagement practices and disseminated the results amongst the network at the EHEN Summit on Harm Reduction: Sustaining Progress, Building on Success, which took place in November.
- For the latest EHEN performance period of May'14-July'14:
  - 11 participating hospitals had a 24 percent reduction in their CAUTI SIR in their non-ICU units, achieving an SIR of 0.81 down from a baseline SIR of 1.07 (Baseline period Jan'13-Jun'13).
  - 22 participating hospitals had a 16.4 percent reduction in their CLABSI SIR for ICU and NON-ICU units, achieving an SIR of 0.51 down from a baseline SIR of 0.61 (Baseline period Jan'12-Jun'12).
  - 19 participating hospitals had an 18 percent reduction in their SSI SIR for abdominal hysterectomy procedures, achieving an SIR of 1.27 down from a baseline SIR of 1.54 (Baseline Period Jan'12-Jun'12).

### Press activities:

n/a

**Publications:**

- America's Essential Hospitals created an Ebola resources landing page on its website with links to current information and resources for hospitals, prominently featuring CDC guidance.

**Other items of note:**

n/a

## Liaison Report

HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)

Centers for Disease Control and Prevention

Meeting Date: December 4 & 5, 2014

Meeting Location: Centers for Disease Control and Prevention, Atlanta, GA

Liaison name: Michael Anne Preas, RN, BSN, CIC

Organization represented: Association for Professionals in Infection Control and Epidemiology

**Interim Activities and updates:**

In Process with a planned release in 2015:

- Implementation Guide for Hand Hygiene
- Implementation Guide Central Line-Bloodstream Associated Infection
- Construction and Infection Prevention publication

**Guidelines and Guidance:**

Please include both in-progress and planned in the coming year. If you have a different format (e.g., information on a website) you don't have to list them here but could just include the link to the website.

n/a

**Position statements:**

n/a

**Legislative and regulatory activities:**

- Submitted testimony to the U.S. Senate Appropriations Committee on the U.S. response to Ebola.
- Submitted comments to CMS on the CY15 End-Stage Renal Disease (ESRD) Prospective Payment System update.
- Submitted comments to CMS on the CY15 Hospital Outpatient Prospective Payment System (OPPS) and Ambulatory Surgical Center Payment System Update.
- Submitted comments to OSHA on extension of the information collection requirements in the Respiratory Protection Standard
- Joined IDSA and 27 other organizations to submit a letter urging the U.S. House Energy and Commerce Subcommittee on Health to consider the Antibiotic Development to Advance Patient Treatment (ADAPT) Act.
- Joined IDSA and 51 other organizations to submit a letter to the Office of Management and Budget requesting funding to address antimicrobial resistance.
- Joined IDSA and 32 other organizations to submit a letter to CMS supporting a recommendation from the President's Council of Advisors on Science and Technology (PCAST) to require hospital and long-term care facilities to implement an antibiotic stewardship program as a Condition of Participation.

### Campaigns and related activities:

- Held successful observance of International Infection Prevention Week, October 19-25, which is now a year-round awareness effort through the broader “Infection Prevention and You” umbrella campaign.
  - 2014 focus: antibiotic resistance
  - Created new consumer infographic: “ABC’s of antibiotics”
  - Re-designed website with new content for consumers and healthcare professionals who do not work in infection prevention
  - Created campaign toolkit with template materials for easy sharing and posting
  - Recruited 42 association partners and 4 corporate champions
  - Promoted social media engagement through E-cards, online quizzes, “clean greeting” video contest
  - Published blog posts, press releases
- Continued discussions on broadening reach of “Infection Prevention and You” campaign through partnerships with consumer organizations.
- Partnered with AHA on development of a “United Against Flu” campaign toolkit to promote influenza vaccination among consumers, especially during the CDC’s National Influenza Vaccination Week, December 7-13
- Ebola education and outreach:
  - Recruited APIC members to train healthcare workers preparing to deploy to West Africa, as part of CDC training classes; many members also provided their expertise in West Africa.
- Recruited APIC members to serve on Rapid Ebola Preparedness Assessment teams.

### Press activities:

- Issued press releases on key articles in APIC’s scientific journal *AJIC*. Topics included:
  - “Common infection control practices in the emergency department: A literature review”
  - “The rise in *Clostridium difficile* infection incidence among hospitalized adults in the United States: 2001 to 2010”
  - “Middle East respiratory syndrome coronavirus: Implications for health care facilities”
  - “Nebraska Biocontainment Unit perspective on disposal of Ebola medical waste”
- Issued press releases and promoted other key APIC initiatives, including:
  - New edition of APIC’s infection control ‘Text’
  - Compendium of Strategies to Prevent Healthcare-Associated Infections in Acute Care Hospitals: 2014 Updates
  - Revised CIC Study Guide
  - ABC’s of antibiotic resistance for consumers – in conjunction with President Obama’s Executive Order to combat antibiotic-resistant bacteria and the CDC’s Get Smart about Antibiotics Week
  - International Infection Prevention Week and antibiotic resistance
  - New 6-week, online course to help infection preventionists manage data
  - Heroes Implementation Research Scholar Award program
  - Partnership in Prevention Award program
- Ebola Press activities:
  - Issued statements on APIC involvement in Ebola education; processing biohazardous waste from Ebola patients (joint statement with Association for the Advancement of Medical Instrumentation); opposition to mandatory quarantine of asymptomatic healthcare providers who have treated patients with EVD (issued an APIC statement as well as a joint statement with SHEA and others)
  - Issued news releases on APIC’s Ebola Readiness Survey and on collaboration with Johns Hopkins on new PPE web training

- Held telephone press briefing on APIC's Ebola Readiness Survey which resulted in 150+ news articles which emphasized the need for hospitals to adequately support infection prevention and control programs
- Served as a resource to media on Ebola infection control issues through 40+ media interviews

**Publications:**

n/a

**Other items of note:**

- Collaborated with CDC, the Johns Hopkins Armstrong Institute for Patient Safety and Quality, the Society of Healthcare Epidemiology of America, and Miami University to create an interactive, web-based, educational training program focusing on proper personal protective equipment (PPE) use for healthcare personnel caring for patients with Ebola.
- Planning and revision for EPI 101, EPI 201, and ASC classes for March delivery. Changes will include the new NHSN guidelines coming in 2015.
- Work continued on APIC's Novice Roadmap, which will assist a novice in progressing to take the CIC exam
- New class model for our EPIs, delivering the content to smaller classes (of 40 rather than audiences of 280+). Classes were well-received and APIC will offer a full slate of them in 2015.
- Webinars were delivered from June - November 2014 to a total audience of approximately 2000 attendees.
- Special topic Q & A Webinars on Ebola response and planning were delivered in October and November to an audience of over 3000 attendees.

## Liaison Report

HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)

Centers for Disease Control and Prevention

Meeting Date: December 4-5, 2014

Meeting Location: Centers for Disease Control and Prevention, Atlanta, GA

Liaison name: Janet Nau Franck Global Director, Managing Infection Risk (MIR)

Organization represented: DNV Healthcare Accreditation

**Interim Activities and updates:**

**DNV Healthcare Inc.** is a provider of hospital accreditation, infection risk management and other select standards. The company was approved in 2008 by the US Centers for Medicare and Medicaid Services (CMS) to accredit acute care hospitals in the United States and since then has also been granted CMS deeming authority for critical access hospitals. DNV Healthcare has also developed quality-based certifications for specialty areas including Comprehensive and Primary Stroke Centers.

DNV Healthcare is part of the DNV GL Group which is a leading provider of classification, certification, verification and training services. With origins stretching back to 1864 and operations in more than 100 countries, our 16,000 professionals dedicated to helping our customers make the world safer, smarter and greener.

DNV has launched a new survey designation that enables hospitals to reduce their risk of infection through an innovative assessment of infection risk. It is called [Managing Infection Risk \(MIR\)](#). Upon completion, the facility will become a DNV Center of Excellence to reflect the achievement.

The Managing Infection Risk (MIR) Standard provides a framework that healthcare organizations can use to build successful systems for risk reducing outcomes. This would include the identification, intervention, and evaluation of trends over time. It is a risk-based, management systems approach, designed to minimize HAIs and associated costs.

**Guidelines and Guidance:**

The Managing Infection Risk (MIR) Accreditation standard can be downloaded at no cost at [www.DNVGL.com](http://www.DNVGL.com). Training courses and workshops are also listed and are continually updated.

**Position statements:**

DNV has developed the Managing Infection Risk standard along with the survey designation which results in certification designation as a Center of Excellence.

**Legislation:**

n/a

**Campaigns and related activities:**

Recent MIR initiatives have included launching initiatives in: US, Singapore, England, Spain, China, Poland, Brazil, Netherlands, Slovenia and Scotland (ISQUA) in 2013-14.

**Press activities:**

Press release announcing first hospitals regarding the launching and achieving MIR Certification and joining the Center of Excellence in October, 2014. [DNV Healthcare Press Release](#). It also describes the integral role of proactive risk assessment in mitigating risk and reducing the potential of HAIs.

**Publications:**

DNV Standard - DNV-DS-HC101- Standard for Managing Infection Risks (Apr 2012, Rev 1)

**Other items of note:**

Over 200 hundred hospitals have attended educational sessions and have expressed interest in pursuing this achievement for their facility. An International Learning Exchange will be formed for hospitals having enrolled in this status to idea share and network internationally. A Users Group for Infection Preventionists in all DNV-GL hospitals is being created to form a clinical forum to discuss HICPAC Guidelines and evidenced based practices.

**Ex-Officio Report**

HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)

Centers for Disease Control and Prevention

Meeting Date: Dec. 4-5, 2014

Meeting Location: Centers for Disease Control and Prevention, Atlanta, GA

Ex-officio name: Daniel Schwartz, MD

Organization represented: Centers for Medicare and Medicaid Services

**Interim Activities and updates:**

CMS has one new measure, Healthcare Worker Immunization, tentatively scheduled for December 2014 initial posting for Hospital Compare website. We have been posting CLABSI, CAUTI, SSI, CDI, and MRSA measures on Hospital Compare for the past several quarterly updates.

CMS also finalized inclusion of CDI and MRSA data in Hospital Value Based Purchasing (VBP) for Fiscal year (FY) 2017 payment, with calendar year 2015 infection events as the initial year performance period. We already include CLABSI, CAUTI, and SSI data for FY 2016 payment in the Hospital VBP program. The performance period for FY 2016 payment is calendar year 2014 infection events. FY 2015 Hospital VBP is the first year that includes CLABSI in the program. The FY 2015 performance period was calendar year 2013 CLABSI infection events, in addition to many other non-HAI measures such as patient experience of care, three 30-day mortality measures, and the AHRQ Patient Safety Indicator composite (PSI-90) measure.

The Hospital-Acquired Condition Reduction Program (HACRP) is new for FY2015. Payment adjustments associated with this program are based on Medicare discharges beginning October 1, 2015. Hospitals in the top (i.e., worst performing) quartile with regard to the HACs in the program will receive a payment adjustment. The top quartile is determined based on a hospital's Total HAC score. For FY15, the HACRP includes CDC's CLABSI and CAUTI measures and AHRQ's PSI90 composite measure. For FY16 we'll be adding CDC's SSI measure (SSI's post abdominal hysterectomy and colon procedures) and for FY 17 we're adding CDC's CDI and MRSA measures. The data will become publicly available for the first time with the December 2014 release of Hospital Compare. Hospitals are aware of their own scores and they know whether they rank in the top quartile, but neither they, nor the public, have seen the full distribution of scores.

**Position statements:**

n/a

**Legislation:**

n/a

**Campaigns and related activities:**

Antibiotic Stewardship

- CMS recognizes the problems of antimicrobial resistance as well as the important role that antimicrobial stewardship programs can play in addressing this growing problem. CMS is currently engaged with the CDC and other professional infection control/epidemiological organizations to gather supporting evidence and background information on this issue and to focus on the development of regulatory changes to the CMS requirements that would promote antimicrobial stewardship programs in hospitals, critical access hospitals, and long-term care facilities. We hope to propose new regulation in 2015 with a target for implementation in 2017. As this effort progresses, CMS plans to also focus on including other healthcare facilities, such as long-term acute care hospitals, ambulatory surgery centers, and dialysis centers.

**Press activities:**

n/a

**Publications:**

S&C: 15-02-Hospitals/CAHs: Information for Hospitals and Critical Access Hospitals (CAHs) Concerning Possible Ebola Virus Disease

S&C: 15-08-CLIA: Information for Clinical Laboratories Concerning Possible Ebola Virus Disease

S&C: 15-10-Hospitals: Emergency Medical Treatment and Labor Act (EMTALA) Requirements and Implications Related to Ebola Virus Disease (Ebola)

S&C: 14-36-All: Infection Control Breaches Which Warrant Referral to Public Health Authorities

S&C: 14-44-Hospital/CAH/ASC: Change in Terminology and Update of Survey and Certification (S&C)

Memorandum 09-55 Regarding Immediate Use Steam Sterilization (IUSS) in Surgical Settings

**Other items of note:**



There are 14 Quality Improvement Organizations-Quality Innovation Networks (QIO QINS) covering healthcare outreach, education, and tracking measurable improvements in healthcare.

The current Statement of Work (SOW) has a new structure of QIO QIN outreach and will be in place for a 5 year period. As in the previous SOW, reducing and preventing Healthcare-Associated Infections (HAI) remains a priority.

QIOs will perform an environment scan to become familiar with hospitals' standardized infection ratio (SIR), particularly in CAUTI, CDI and CLABSI. The national CAUTI SIR has been trending upward, particularly in ICUs, which underscores the importance of incorporating the core principles of behavioral change, including culture change, starting with facility leadership.

In addition, despite the major reductions in CLABSI rates, we've seen a national plateauing in the past several quarters. The QIO QINs are uniquely positioned to examine infection data at the more granular hospital unit level and focus more directed technical assistance when necessary.

In CDI work, QIO QINs will concentrate not only on CDI data, but on programs for antimicrobial stewardship, as this is a subject with the ability to cross multiple settings (similar to HAI work) and will be worked on across multiple patient safety aims.

Lastly, we continue to utilize partnership engagement and learning and action networks to exchange best practices in infection control and prevention.

## **Liaison Report**

HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)

Centers for Disease Control and Prevention

Meeting Date: Dec 4-5, 2014

Meeting Location: Centers for Disease Control and Prevention, Atlanta, GA

Liaison name: Michael Howell, MD MPH

Organization represented: Society of Critical Care Medicine

### **Interim Activities and updates:**

#### **Ventilator-Associated Events**

With the publication of Klompas et al. Preventability of ventilator-associated events: the CDC Prevention Epicenters' Wake up and Breathe Collaborative. Am J Respir Crit Care Med. 2014 Nov 4, it has become clear that management of sedation and mechanical ventilation weaning is critical to prevention of ventilator-associated events. SCCM reports the following activities:

- Guideline dissemination: A grant has been received from the Gordon and Betty Moore Foundation to create metrics and conduct a three cohort collaborative of approximately 45 hospitals to improve dissemination and uptake of the 2013 Clinical Practice Guideline for the Management of Pain, Agitation and Delirium in Adult Patients in the Intensive Care Unit. These guidelines have started a revision process with a planned release in 2016.

#### **Catheter-Associated UTI**

- SCCM is subcontracting with AHA/AHRQ to conduct an improvement collaborative in the Southeast. The aim is to reduce CAUTI rate in ICUs. Embedding proper techniques for insertion and systems to evaluate the need for catheters are components.

#### **Sepsis**

- SCCM, with funding from the Gordon and Betty Moore Foundation, is conducting extensive collaboratives on the early identification of hospital-identified sepsis on the med/surg wards.
  - A grant has been received from Gordon and Betty Moore Foundation to create a publication entitled “Spotlight on Success” featuring the experiences of hospitals implementing a process for sepsis screening on inpatient wards – every patient, every shift, every day.
  - Early reports from 54 hospitals in an improvement collaborative cohort on the West Coast, South, East Coast and Midwest are that between 0 – 6 patients per month are found to have severe sepsis or septic shock on inpatient wards and that embedded screening practice is helping to identify other clinical conditions early for intervention.
  - This work is being conducted with faculty from the Surviving Sepsis Campaign, the Society of Hospital Medicine and additional funding and support from the Adventist Health System.
- The Hellman Foundation has provided grant funding to conduct a pilot project in Gitwe Rwanda to educate on early recognition of sepsis in pediatric and adult patients in community clinics and doctor’s offices. Simple Sepsis kits will be provided to health care providers along with reference materials.

#### **Post-ICU Syndrome / Survivorship**

- The SCCM Council has approved an expenditure of \$990K to support the development of a patient-family support network related to post intensive care syndrome entitled, “Thrive”. This effort is in its very early stages with committee appointments underway.

#### **Ebola Virus Disease training**

- The SCCM Fundamental Disaster Management committee worked with Chest to offer a session at their Congress in October on proper use of personal protection devices for Ebola.

#### **Guidelines and Guidance:**

Please include both in-progress and planned in the coming year. If you have a different format (e.g., information on a website) you don’t have to list them here but could just include the link to the website.

1. Work has begun on revision of the Surviving Sepsis Campaign guideline anticipated publication 2016. There are now 6 translations for the 2012 guidelines: Chinese, Portuguese, German, Spanish, French and Japanese.
2. Drs. Emanuel Rivers and Sean Townsend continue to work with CMS and NQF on modifications to the 0500 measures based on results from recent clinical trials. The steward for these measures is currently Henry Ford Hospital.
3. SCCM has been in close contact with the CDC to discuss and collaborate on a revision of the definition of sepsis. Definition work has already begun as Joint project between the European Society of Intensive Care Medicine and SCCM. Liaisons from other organizations are included in this revision work.
4. The Quality & Safety Committee of SCCM will conduct a town hall meeting at the SCCM Congress in Phoenix in January to determine what new guidelines are needed to enhance patient safety and improve care. These findings will be presented to the SCCM Board of Regents for action.
5. SCCM is now entering the final year of an AHRQ grant (Project Dispatch) with a focus on dissemination of patient-centered outcomes programs and projects.

#### **Publications:**

A selection of recent infection-prevention-related studies in *Critical Care Medicine*, the principal journal of the Society of Critical Care Medicine:

1. Kollef MH, Chastre J, Fagon JY, et al. Global prospective epidemiologic and surveillance study of ventilator-associated pneumonia due to *Pseudomonas aeruginosa*\*. *Critical care medicine*. 2014;42(10):2178-2187.
2. Traa MX, Barboza L, Doron S, Snyderman DR, Noubary F, Nasraway SA, Jr. Horizontal infection control strategy decreases methicillin-resistant *Staphylococcus aureus* infection and eliminates bacteremia in a surgical ICU without active surveillance\*. *Critical care medicine*. 2014;42(10):2151-2157.
3. Lilly CM, Landry KE, Sood RN, et al. Prevalence and test characteristics of national health safety network ventilator-associated events. *Critical care medicine*. 2014;42(9):2019-2028.

4. Lewis SC, Li L, Murphy MV, Klompas M, Epicenters CDCP. Risk factors for ventilator-associated events: a case-control multivariable analysis. *Critical care medicine*. 2014;42(8):1839-1848.
5. Micek ST, Heard KM, Gowan M, Kollef MH. Identifying critically ill patients at risk for inappropriate antibiotic therapy: a pilot study of a point-of-care decision support alert. *Critical care medicine*. 2014;42(8):1832-1838.
6. Safdar N, O'Horo JC, Ghufuran A, et al. Chlorhexidine-impregnated dressing for prevention of catheter-related bloodstream infection: a meta-analysis\*. *Critical care medicine*. 2014;42(7):1703-1713.

**Other items of note:**

n/a

## Liaison Report

HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)

Centers for Disease Control and Prevention

Meeting Date: December 4-5, 2014

Meeting Location: Centers for Disease Control and Prevention, Atlanta, GA

Liaison name: Mark Rupp, MD

Organization represented: Society for Healthcare Epidemiology of America

### Interim Activities and updates:

**SHEA Board of Trustees**

SHEA has announced its 2015 Board of Trustees election results:

**Vice President: Sara Cosgrove, MD**

**Councilors: Mary Hayden, MD, and Hilary Babcock, MD**

SHEA Board of Trustees continues to look at the role of the hospital epidemiologist and ways to develop tools for members to use in valuing and articulating the work they do within the hospital setting. Discussions have only just begun, but work on a SHEA White Paper detailing the core competencies of the hospital epidemiologist will be forthcoming later this year or early next year. Additional ideas are being discussed as well to provide a robust package to members.

The SHEA Antimicrobial Stewardship task force was voted by the board to become a full committee in order to fully plan the SHEA strategy in addressing this topic. It has liaisons to almost all SHEA Committees and will meet at IDWeek to formalize a strategy for the committee.

### SHEA Ebola Efforts

SHEA created an Ebola Resource page for members that referenced key CDC, WHO and other guidance documents as well as hosted several member resources that members could use for reference. SHEA created talking point for members for press activities and coordinated interviews for SHEA volunteer leaders in both print and TV press. SHEA worked with the CDC to coordinate SHEA representatives on the CDC Rapid Ebola Preparedness Teams at individual hospitals.

### Education

***Primer on Healthcare Epidemiology, Infection Control and Antimicrobial Stewardship***

Launching in early 2015, this online educational course offers any Infectious Diseases practitioner or Fellow an opportunity to learn the basics of healthcare epidemiology, infection control and antimicrobial stewardship. Written by adult and pediatric experts in the field, case-based information is presented in a dynamic and

interactive learning environment intended to highlight the role of the healthcare epidemiologist. Topics covered include: pathogen transmission, outbreak management in the healthcare setting, approach to control of bioterrorism agents, advanced occupational health management, implementing antimicrobial stewardship and the prevention and management of multidrug resistant organisms including *Clostridium difficile*, surgical site infections and device-associated infections. CME is available for this course. This is a product of the membership of the Society of Healthcare Epidemiology of America and is endorsed by Infectious Disease Society of America (IDSA) and Pediatric Infectious Disease Society (PIDS).

### **2015 California SHEA Stewardship Conference**

SHEA will be co-organizing with the Infectious Disease Association of California, a Stewardship Conference for California practitioners. The conference is scheduled for February 2-3, 2015 in Los Angeles. The conference is in response to a California state bill passed earlier this fall that requires all hospitals to have a stewardship program.

### **SHEA Spring 2015: Science Guiding Prevention**

Under the leadership of Co-Chairs, Drs. Eli Perencevich and Susan Huang, the SHEA 2015 conference planning is fully underway. The new format will combine the highly regarded SHEA Basic Training Course in Hospital Epidemiology, along with a new tract dedicated to Post-Acute and Long Term Care; with plenary, abstract and symposia with a focus on infection prevention topics including long-term care, implementation science, science communication, MDROs, device infections and stewardship. A strong emphasis will be placed on networking and mentoring sessions. The meeting will take place in Orlando, Florida, May 14-17th. The abstract site will be open from August 1, 2014 to January 16th, 2015 and awards will be given to the top abstracts. [www.shea2015.org](http://www.shea2015.org).

## **Guidelines and Guidance:**

Please include both in-progress and planned in the coming year. If you have a different format (e.g., information on a website) you don't have to list them here but could just include the link to the website.

**SHEA Guidelines Committee, led by Chair Dr. Gonzalo Bearman and Past Chair Dr. Kristina Bryant**

### **Guidelines:**

SHEA continues to participate in guideline development with IDSA and others, covering topics including *C. difficile*, antimicrobial stewardship, infectious diarrhea, HAP/VAP, and nosocomial meningitis.

In October 2014, SHEA publicly posted a Response to Institutions' Implementation of 2010 Guideline for Healthcare Workers Infected with Bloodborne Pathogens ([Bloodborne Pathogens Public Letter](#)). The letter affirmed that 1) infected providers who are not conducting invasive procedures present virtually no risk to their patients, 2) providers with well-controlled infection and who conform to specific infection prevention practices may safely perform invasive procedures, and 3) a healthcare provider's status should not be the sole determinant in his or her ability to perform duties, including exposure-prone procedures.

### **Expert Guidance Papers:**

As a result of discussions between the Guidelines Committee, Research Committee, and Board of Trustees, the Guidelines Committee has embarked on several "expert guidance" statements designed to provide ungraded recommendations for practice questions that would otherwise go unaddressed for topics that lack the evidence to meet the GRADE system. These guidance statements are based on literature review, surveys, review of policies, and expert consensus.

Two multidisciplinary writing groups are in the final stages of writing guidance on the presence of animals in healthcare facilities and isolation precautions for visitors. Both are expected to publish in ICHE in 2015.

#### ***Compendium of Strategies to Prevent Healthcare-Associated Infections in Acute Care Hospitals***

- SHEA and IDSA, with AHA, The Joint Commission, and APIC, and with representation from additional professional societies have published the full updated Compendium of Strategies to Prevent Healthcare-Associated Infections in Acute Care Hospitals. The articles were rigorously reviewed by an appointed Expert Panel, the relevant committees of each of the partnering organizations, the Boards of each partnering organization, and CDC, as well as a public comment period. The articles of the 2014 Update include implementation sections within each of the topic areas.
- SHEA is leading the writing process for a companion implementation document to HICPAC's "Guideline for Prevention of Infections among Patients in NICU." The writing group includes representatives from IDSA, PIDS, NANN, AAP, and Vermont Oxford, and is headed by Kris Bryant (SHEA Guidelines Committee Past Chair) and Alexis Elward (HICPAC NICU Guidelines lead). The document will address the areas of C. difficile, CAUTI, MRSA, and respiratory infection prevention.
- The update of the Compendium will include edits to the patient guides based on the chapters, and the Compendium Partners are working with the CDC Foundation to develop materials and facilitate dissemination of the guides in 2015.

Policy:

#### **FDA's Proposal on Topical Antimicrobial Drug Products for OTC Human Use**

SHEA submitted comments to the FDA's proposal on topical antimicrobial drug products for OTC human use. Allison Aiello also presented on behalf of SHEA at the FDA Non-Prescription Drugs Advisory Committee meeting, which focused on standards used to demonstrate the effectiveness of OTC topical antiseptics used in healthcare settings for hand washes, rubs, surgical hand scrubs and rubs, and patient preoperative and pre-injection skin preparations.

#### **Responded to CMS' Medicare Hospital Inpatient Prospective Payment System (IPPS) proposed changes for FY 2015**

SHEA submitted comments to the CMS Medicare Hospital IPPS proposed changes for FY 2015.

#### **Participating in the U.S. Stakeholder Forum on Antimicrobial Resistance (S-FAR)**

SHEA is excited to participate in this new stakeholder forum organized by IDSA and looks forward to the launch meeting at IDWeek.

#### **Alliance on Aging Research HAI/Stewardship Summit**

SHEA participated in a summit that included several organizations concerned with HAIs and stewardship policy issues as they relate to the aging populations in different health care settings, including post-acute care and long term care settings.

#### **SHEA Released Statement in Conjunction with PCAST Report**

SHEA released a statement applauding the White House on efforts to tackle antimicrobial resistance nationally. Additionally, SHEA is in the process (as of this report) of releasing a statement specifically supporting the Executive Order and 5 year plan for resistance, specifically commenting on the stewardship and surveillance sections of the plan as well as commenting on the critical need for hospital epidemiology and infection control to tackle antimicrobial resistance.

#### **Testimony to the US Senate Appropriations Committee re: Emergency Ebola Funding**

SHEA submitted testimony in support of the federal government's plan for a well-coordinated, science-driven response cutting across multiple agencies to address the outbreak in West Africa and to prevent the spread of Ebola in the United States. SHEA's testimony fully supported the Administration's request for emergency funding of \$6.18 billion in order to continue this response plan, including additional funding for the CDC, NIH, public health systems, etc. SHEA urged that this supplemental funding should not come at the expense of other infectious diseases programs, so that preparedness and response efforts for future outbreaks are not undermined.

**Campaigns and related activities:**

The SHEA Research Network activity was put on hold to accommodate our member's robust Ebola preparation activities. Activity will be restarted in January 2015.

**Press activities:**

Below is a list of press releases that SHEA has released in the past few months. To read the complete text of any of the releases visit [SHEA Press Room](#).

- 11/17/14 - Antibiotic Misuse Threatens Modern Medicine
- 10/31/14 - Leading Infectious Disease Medical Societies Oppose Quarantine for Asymptomatic Healthcare Personnel Traveling from West Africa
- 10/26/14 - SHEA Supports Evidence-Based Measures to Prevent Ebola Transmission, Opposes Mandatory Quarantine for Healthcare Personnel
- 10/22/14 - Automated Tracking Increases Compliance of Flu Vaccination for Healthcare Personnel
- 10/22/14 - Proper Dental Care Linked to Reduced Risk of Respiratory Infections in ICU Patients
- 10/14/14 - Newest Ebola Case in a Health Care Worker Points to Need for Increased Funding for Infection Prevention Programs
- 10/06/14 - SHEA Response to Institutions' Implementation of 2010 Guideline for Healthcare Workers Infected with Bloodborne Pathogens
- 09/30/14 - SHEA Applauds California for Mandating Antimicrobial Stewardship in State's Hospitals
- 09/22/14 - SHEA Supports National Strategy to Combat Antibiotic-Resistant Bacteria
- 09/18/14 - SHEA Applauds White House on Efforts to Tackle Antimicrobial Resistance Nationally
- 09/10/14 - Unnecessary Antibiotic Use in Hospitals Responsible for \$163 Million in Potentially Avoidable Healthcare Costs
- 09/10/14 - Healthcare Workers Wash Hands More Often When in Presence of Peers
- 08/13/14 - Bacteria responsible for dangerous bloodstream infections growing less susceptible to common antiseptic
- 08/13/14 - MRSA Colonization Common in Groin and Rectal Areas
- 08/01/14 - Ebola Infection Control Resources
- 07/16/14 - Cases of Drug-Resistant Superbug Significantly Rise in Southeastern U.S.
- 07/16/14 - Expert Guidance on Hand Hygiene in Healthcare Settings
- 07/16/14 - Recommendations Prioritize Strategies to Prevent Ventilator-Associated Pneumonia

The SHEA/Medscape collaboration continues featuring expert commentaries and select articles from Infection Control and Hospital Epidemiology. The SHEA page is available at: [SHEA Medscape page](#). SHEA is also creating a slideshow with Medscape on the practical recommendations associated with the Compendium, to be launched before the end of 2014.

SHEA has an active social media presence:  
LinkedIn – The Society for Healthcare Epidemiology Group  
Twitter: @SHEA\_Epi



Facebook: [www.facebook.com/SHEAPreventingHAIs](http://www.facebook.com/SHEAPreventingHAIs)

### Publications:

#### **Compendium of Strategies to Prevent Healthcare-Associated Infections in Acute Care Hospitals – 2014 Update**

The updated Compendium was released in ICHE, including a supplement of all sections in the October 2014 issue.

#### **New Publisher**

Cambridge University Press starts publishing the January 2015 issue of ICHE. Members will start accessing the site in December and all back issues will be fully digitized on this platform.

### Other items of note:

#### **HHS, APIC, and SHEA 2014 Partnership in Prevention Award**

On November 21, 2014 the U.S. Department of Health and Human Services (HHS), the Association for Professionals in Infection Control and Epidemiology (APIC), and the Society for Healthcare Epidemiology of America (SHEA) awarded the University of Vermont Medical Center with the 2014 Partnership in Prevention Award for achieving sustainable improvements toward eliminating healthcare-associated infections (HAIs). This annual award is based on the concepts of the “National Action Plan to Prevent Health Care-Associated Infections: Roadmap to Elimination.” A recorded webinar will be available for download on the SHEA Website.

## Liaison Report

HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)

Centers for Disease Control and Prevention

Meeting Date: December 4-5, 2014

Meeting Location: Emory Conference Center, Atlanta, GA

Liaison name: Amber Wood

Organization represented: Association of periOperative Registered Nurses

### Interim Activities and updates:

- AORN Recommended Practices title change to Guidelines for Perioperative Practice.
  - The Institute of Medicine’s “Clinical Practice Guideline” describes guidelines as a “systematically developed statement to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances.” The AORN Recommended Practices meets the definition of a clinical practice guideline. Our decision to retitle is primarily driven by the acceptance of our updated evidence-based Recommended Practices by the National Guidelines Clearinghouse (NGC) as nationally recognized guidelines for perioperative practice. AORN Recommended Practices documents are evidence-based; the individual references are now appraised and scored, and the recommendations are evidence-rated according to strength and quality of the evidence supporting the recommendation using the recently developed AORN Evidence Rating Model.
- Perioperative Guidance for Ebola: <http://www.aorn.org/clinicalfaq/ebola/>
- Briefings and Debriefings Video Contest ends December 31st  
<http://www.aorn.org/BriefingsVideoContest/>
- AORN Surgical Conference & Expo 2015, March 7-11, 2015, Denver, CO  
<http://www.aorn.org/surgicalexpo/>
  - OR Executive Summit™
  - Leadership Development Summit™

### **Guidelines and Guidance:**

Please include both in-progress and planned in the coming year. If you have a different format (e.g., information on a website) you don't have to list them here but could just include the link to the website.

The 2014 Perioperative Standards and Recommended Practices include 4 new evidence rated guidelines: Pneumatic Tourniquet, Environmental Cleaning, Sharps Safety, & Selection and Use of Packaging Systems for Sterilization. Ambulatory supplements provided in this edition. These guidelines are available in print and through electronic access (e-subscription and e-book). Information on how to obtain can be found at [www.aorn.org](http://www.aorn.org).

- Available electronically now (will be in 2015 book): Safe Environment of Care Part 2, Specimen Management, Preoperative Patient Skin Antisepsis, Surgical Attire, Care and Cleaning of Surgical Instruments, and Surgical Tissue Management.
- Available in 2015: Local Anesthesia, Complementary Care Interventions
- Guidelines in development: Radiation Safety, Thermoregulation, Prevention of Retained Surgical Items, Flexible Endoscopes, and Moderate Sedation
- Submitting to NGC: Preoperative Patient Skin Antisepsis, Surgical Attire, and Surgical Tissue Management

### **Position statements:**

Revised Position statements: Noise in the Perioperative Practice Setting, Environmental Responsibility, The Role of the Health Care Industry Representative in the Perioperative Invasive Procedure Setting, and Advanced Practice Registered Nurses in the Perioperative Environment.

### **Legislation:**

The AORN legislative priorities for 2014 are RN as circulator, preserving and protecting the Perioperative Registered Nurse's scope of practice, supporting workplace safety and patient safety initiatives, and advancing positive health care improvements.

### **Campaigns and related activities:**

Sharps Safety Campaign.

### **Press activities:**

Recent AORN press releases can be accessed at [www.aorn.org](http://www.aorn.org).

### **Publications:**

2014 Perioperative Standards and Recommended Practices, AORN Journal, Perioperative Job Descriptions and Competency Evaluation, & Perioperative Policies and Procedures

## **Liaison Report**

HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)

Centers for Disease Control and Prevention

Meeting Date: December 4-5, 2014

Meeting Location: Centers for Disease Control and Prevention, Atlanta, GA

Liaison name: Debra Blog, MD, MPH (substituting for Emily Lutterloh, MD, MPH)

Organization represented: Association of State and Territorial Health Officials (ASTHO)

### **Interim Activities and updates:**



ASTHO is working in collaboration with CDC to develop tools and collect best practices for state HAI prevention.

ASTHO is currently developing a web-based toolkit to support health departments in accessing electronic health records for healthcare-associated outbreak investigation. The toolkit, which will be released in early 2015, is based on an assessment of experiences and tools from twelve states.

ASTHO is developing a report, to be released early 2015, on antimicrobial stewardship that describes current state activities and presents a range of opportunities for health agencies to develop or enhance stewardship policies and activities. The report presents the results of a survey of HAI coordinators, findings from three state capacity building projects, and recommendations, tools and examples for states looking to initiate or enhance stewardship activities.

ASTHO convened a conversation between state health officials, state agricultural officials, and CDC on the issue of antimicrobial resistance and stewardship. The Nov 12 meeting was designed to increase understanding of the issues regarding antibiotic resistance in human pathogens and its intersection with agriculture and explore the level of interest in joint leadership and collaboration among public health and agricultural officials at the state level.

ASTHO is a member of the U.S. Stakeholder Forum on Antimicrobial Resistance (S-FAR), a national stakeholder group on antimicrobial resistance comprised of over 75 national organizations convened by the Infectious Diseases Society of America. ASTHO attended the inaugural S-FAR meeting on October 9.

Ongoing:

ASTHO monitors developments in HAI-related policies and initiatives, shares this information with members, represents the state health agency perspective, and enhances collaboration with partners. ASTHO participates on the Safe Injection Practices Coalition, CSTE HAI Subcommittee and HAI Standards Committee, and National Healthcare Safety Network Steering Committee Workgroup.

### **Guidelines and Guidance:**

Please include both in-progress and planned in the coming year. If you have a different format (e.g., information on a website) you don't have to list them here but could just include the link to the website.

n/a

### **Position statements:**

Antimicrobial Resistance and Stewardship Position Statement, available at [ASTHO Position Statement](#).

ASTHO's Antimicrobial Resistance and Stewardship Position Statement affirms the need for an ongoing public health commitment to support state health agency roles and ensure adequate capacity to address antibiotic resistance – including sound surveillance methods; effective education of healthcare workers and the public; and stable funding streams for health agencies.

### **Legislation:**

Ongoing: Real-time state HAI legislative tracking on ASTHO's website, available at [ASTHO HAI legislative tracking](#).

### **Campaigns and related activities:**

Ongoing: ASTHO provides information to health officials on pertinent HAI issues through conference calls (All S/THO Call) and the *State Public Health Weekly* newsletter.

### **Press activities:**

n/a

**Publications:**

ASTHO's HAI Publications are available at [ASTHO HAI Publications](#)

**Other items of note:**

n/a

## Liaison Report

HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)

Centers for Disease Control and Prevention

Meeting Date: December 4-5, 2014

Meeting Location: Centers for Disease Control and Prevention, Atlanta, GA

Liaison name: Stephen Weber, MD

Organization represented: Infectious Diseases Society of America

**Interim Activities and updates:**

1. **IDSA Provides Testimony for Senate Hearing on Ebola Funding (11/12/14)** - IDSA provided testimony to the Senate Appropriations Committee in support of President Obama's request for emergency funds to deal with the Ebola outbreak.
2. **IDSA Pledges Support to U.S. Ebola Response Coordinator Ron Klain (10/29/14)** - In a letter to U.S. Ebola Response Coordinator Ron Klain, IDSA President Dr. Stephen Calderwood outlined the Society's Ebola response efforts to date and volunteered IDSA's expertise and resources to help the federal government coordinate the U.S. and global response.
3. **IDSA Leads 55 Organizations in Effort to Support Funding for Antibiotic Resistance Initiatives (10/27/14)** - IDSA was joined by 55 other organizations in a letter to the White House Office of Management and Budget (OMB) in support of new funding to address antibiotic resistance.
4. **IDSA Leads Groups in Letter to CMS on Stewardship** - IDSA was joined by 33 other organizations in a letter to the Centers for Medicare & Medicaid Services (CMS) advocating that hospitals and long-term care facilities be required to implement an antibiotic stewardship program (ASP) as a Condition of Participation (COP) in Medicare and Medicaid.
5. **IDSA Applauds FDA and NIH for Advancing Federal Dialogue on Antibiotic Resistance** - In a letter to the FDA commissioner and NIH director, IDSA thanks the respective agencies for holding a productive and thought provoking public workshop on antimicrobial product development and enthusiastically welcomes NIH's announcement of a forthcoming public-private partnership (PPP) to address antibiotic development and related effort to establish a master clinical trials protocol.

**Guidelines and Guidance:**

Please include both in-progress and planned in the coming year. If you have a different format (e.g., information on a website) you don't have to list them here but could just include the link to the website.

In development:

1. Antimicrobial Stewardship in Diff Healthcare Settings
2. Aspergillosis (Update)
3. Bone and Joint Infections in Children - *joint w/PIDS*
4. Candidiasis (Update)
5. Clostridium Difficile (Update) - *Joint w/SHEA*
6. Coccidiomycosis (Update)

7. Community-acquired pneumonia - (Update) - *Joint w/ATS*
8. Cysticercosis
9. Diarrhea (Update)
10. Hospital-acquired, ventilator-acquired pneumonia (Update) - *Joint w/ATS*
11. Influenza (Update)
12. Intra-Abdominal Infections (Update)
13. IV Catheter Management (Update)
14. Leishmaniasis
15. LTBI Diagnosis *Joint w/ ATS, CDC and IDSA*
16. LTBI Treatment *Joint w/ ATS, CDC and IDSA*
17. Nosocomial Meningitis
18. Outpatient Parenteral Anti-Infective Therapy (OPAT) - (Update)
19. Pain Management in HIV
20. Vancomycin - (Update) *Joint w/ASHP/SIDP/PIDS*
21. Vertebral Osteomyelitis

Link to other guidelines on website: [IDSA Practice Guidelines](#)

#### **Position statements:**

1. IDSA released a position statement opposing involuntary Ebola quarantine policies promulgated by New Jersey, New York, and other states for symptom-free healthcare workers returning from West Africa

#### **Legislation:**

1. **IDSA Provides Testimony for Senate Hearing on Ebola Funding** (11/12/14) - IDSA provided testimony to the Senate Appropriations Committee in support of President Obama's request for emergency funds to deal with the Ebola outbreak.

#### **Campaigns and related activities:**

Key areas of IDSA focus related to infection prevention and control include:

1. Ebola and emerging infection readiness: [http://www.idsociety.org/Biothreat\\_Policy/](http://www.idsociety.org/Biothreat_Policy/)
2. Antimicrobial resistance and stewardship: [http://www.idsociety.org/AR\\_Policy/](http://www.idsociety.org/AR_Policy/)
3. Infection prevention and control: [http://www.idsociety.org/Infection\\_Control\\_Policy/](http://www.idsociety.org/Infection_Control_Policy/)
4. Immunizations and vaccinations: [http://www.idsociety.org/Immunization\\_Policy/](http://www.idsociety.org/Immunization_Policy/)

#### **Press activities:**

**Selected news releases from:** [http://www.idsociety.org/News\\_Releases/](http://www.idsociety.org/News_Releases/)

1. DSA applauds White House action and House Committee's leadership on antibiotic resistance; calls for renewed effort on multi-pronged approach (9/19/2014)
2. Statement from IDSA President Barbara Murray, MD, FIDSA, on PCAST Meeting (7/11/2014)
3. Increase in MRSA Prompts Updated IDSA Guidelines for Skin and Soft Tissue Infections (SSTI) (6/19/2014)

#### **Publications:**

1. Havers, et al. Use of Influenza Antiviral Agents by Ambulatory Care Clinicians During the 2012–2013 Influenza Season. *Clin Infect Dis* 2014; 59: 783-6.

#### **Other items of note:**

1. IDSA launched the U.S. Stakeholder Forum on Antimicrobial Resistance (S-FAR), the largest stakeholder partnership in the U.S. to date, with nearly 100 national organizations joining so far. IDSA hosted the inaugural meeting of S-FAR in Philadelphia on October 9.

## Ex-Officio Report

HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)

Centers for Disease Control and Prevention

Meeting Date: December 4-5, 2014

Meeting Location: Centers for Disease Control and Prevention, Atlanta, GA

Ex-officio name: David K. Henderson, M.D.

Organization represented: National Institutes of Health

### Interim Activities and updates:

1. Since the previous HICPAC meeting, the NIH has engaged with DHHS and other federal Agencies to address various aspects of the Ebola epidemic in West Africa. The Clinical Center has provided care for two patients – one a Maryland physician who sustained a high risk occupational exposure, the other the first of the two intensive care unit nurses from Dallas who became ill after providing care for Thomas Eric Duncan, the Liberian man who was the first person to be diagnosed with Ebola in the US. The NIH and the NIH Clinical Center have long and august histories of addressing significant public health emergencies as they have occurred in our society. Medical science has had extremely limited experience with this disease in any setting in which the infected patient's physiology can be carefully and systematically assessed. In that context, managing such a patient in the sophisticated clinical research environment of the Clinical Center makes implicit sense and offers a substantial opportunity for us to learn about the disease's unique pathophysiology, as well as the optimal approaches to the management of patients who have this disease. Both patients were discharged after approximately 10 to 12 days of hospitalization. The physician never developed clear signs of EVD and the nurse recovered completely.
2. The Clinical Center's containment unit, the Special Clinical Studies Unit (SCSU) was specially designed to be able to provide safe care for patients requiring any level of infectious diseases isolation. Few such facilities exist in the US. The SCSU includes a high-quality isolation room that can be transformed for provision of intensive care. Numerous redundant systems and precautions are in place to maintain isolation of the SCSU from the rest of the Clinical Center and the surrounding community. These systems and precautions include special air handling systems, cardkey restricted access, separate entrance and exit pathways for staff, including a shower prior to exit, and detailed protocols for clinical care and waste handling. Staff involved in the direct management of the patient or specimens from EVD patients received extensive training and practiced repeatedly in the use of PPE and in the special standard clinical operating procedures that are designed specifically for the SCSU and that assure they are able to provide high quality care for EVD patients safely. All the staff who helped provide care for the EVD patients have volunteered to do so.
3. NIH is working hard to contribute both to the understanding of EVD as well as strategies for preventing its spread. For example, NIAID has nearly completed a Phase 1 study of a new candidate Ebola Virus Vaccine at the NIH Clinical Center; NIAID intramural scientists developed this vaccine. The vaccine employs a replication incompetent chimpanzee adenovirus vector carrying the gene for the ebola coat glycoprotein. The vaccine uses a 'prime-boost' strategy, with the primary inoculation being made with the chimp adenovirus vector with a modified vaccinia Ankara boost. The vaccine demonstrated protective efficacy in a Rhesus macaque model – protecting 4/4 macaques from lethal Ebola inoculation. The Phase I trial in humans required twenty volunteer participants; all 20 have been vaccinated. No adverse events were observed, and we are awaiting the immunological results, which should be available within a week or so. A second study began earlier this month evaluating another candidate Ebola vaccine. This second vaccine study is also taking place. This vaccine is being jointly developed by the Department of Defense and Canadian collaborators. This vaccine employs a replication-competent horse vesicular stomatitis virus

vector. Phase I trials are underway at the Clinical Center and at several other sites in the US, Canada, Europe, and Africa.

4. Work is ongoing evaluating the transmission of Vancomycin-resistant *Enterococcus faecium* (VRE) in our hospital environment.
5. In addition, studies of CRE transmission are also continuing. We continue to aggressive microbial surveillance for CRE and other MDR gram-negatives. Since July 2012, we have not detected transmission of any CRE isolates, but have detected 14 new isolates of CRE – all of which are genetically dissimilar to our epidemic strain and to each other. Two of these isolates harbored the New Delhi Metallo-beta-lactamase-1 gene.

**Position statements:**

1. Bearman G, Bryant K, Leekha S, Mayer J, Munoz-Price LS, Murthy R, Palmore TN, Rupp ME, White. Healthcare Personnel Attire in Non-Operating-Room Settings. *Infect Control Hosp Epidemiol* 2014; 35(2): 107-21.

**Legislation:**

n/a

**Campaigns and related activities:**

n/a

**Press activities:**

1. NIH Press Briefing on Texas Nurse with Confirmed Ebola at the NIH Clinical Center (<http://videocast.nih.gov/summary.asp?Live=15025&bhcp=1>)
2. NIH Media Briefing on Discharge of Ebola Patient from its Clinical Center Special Clinical Studies Unit. (<http://videocast.nih.gov/summary.asp?Live=15105&bhcp=1>)
3. Texas nurse free of Ebola virus; discharged from NIH Clinical Center (<http://www.nih.gov/news/health/oct2014/od-24a.htm>)

**Publications:**

1. Conlan S, Thomas PJ, Deming C, Park M, Lau AF, Dekker JP, Snitkin ES, Clark TA, Luong K, Song, Tsai Y-C, Boitano M, Gupta I, Brooks SY, Schmidt B, Alice C. AC, Thomas JW, Bouffard GG, Blakesley RW, NISC Comparative Sequencing Program, Mullikin JC, Korfach J, Henderson DK, Frank KM\*, Palmore TN\*, Segre JA. Single molecule sequencing to track plasmid diversity of hospital-associated carbapenemase-producing Enterobacteriaceae. *Sci Trans Med* 2014 *Sci Transl Med*. 6(254), p. 254ra126 (1-12).
2. Beekmann SE, Henderson DK. Prevention of HIV/AIDS: Post-exposure prophylaxis (including healthcare workers). *Infect Dis Clin North Amer*. *In press*.
3. Beekmann SE, Henderson DK. Occupational Exposures to Healthcare Workers: New Ways to Prevent and to Recommend Postexposure Prophylaxis for HIV, Hepatitis B and C). *Curr Treat Options Infect Dis*. *In press*.
4. Decker BK, Palmore TN. Hospital water and opportunities for infection prevention. *Current infectious disease reports*. 2014;16(10):432.
5. Palmore TN, Henderson DK. Carbapenem-resistant Enterobacteriaceae: a call for cultural change. *Annals of internal medicine*. 2014;160(8):567-9.

## Liaison Report

HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)

Centers for Disease Control and Prevention

Meeting Date: December 4-5, 2014

Meeting Location: Centers for Disease Control and Prevention, Atlanta, GA

Liaison name: Robert G. Sawyer, MD

Organization represented: Surgical Infection Society (SIS). Website: [www.sisna.org](http://www.sisna.org)

### Interim Activities and updates:

The annual Surgical Infection Society strategic planning meeting was held in October in San Francisco. Major themes included improving the presence of the SIS on social media and becoming the source of information for surgeons on surgical implications of Ebola hemorrhagic fever. A statement from the Society regarding the latter can be found at <http://www.sisna.org/Assets/ee14f635-c184-4887-ac56-41eea7f75a8e/635479761714300000/surgical-infection-society-statement-on-ebola2-pdf>.

### Guidelines and Guidance:

Please include both in-progress and planned in the coming year. If you have a different format (e.g., information on a website) you don't have to list them here but could just include the link to the website.

#### 1. Guidelines in process

The members of the Guidelines and Therapeutics Committee are conducting the following systematic review:  
**Project: To summarize the level of evidence and determine grades of recommendations for the prophylaxis and treatment of infections in the context of traumatic injury.**

**A recent conference call yielded consensus that the following sub-projects will be pursued:**

1. Antibiotics for facial trauma
  - a. October 2014: completion of analysis
  - b. December 2014: manuscript submission to *Surgical Infections*
2. Revision of 2010 Guidelines for the management of intra-abdominal infections
  - a. August 2014 Review literature
  - b. November 2014 Complete analysis
  - c. December 2014 Submit manuscript

### Position statements:

Surgical Infection Society Statement on Ebola Hemorrhagic Fever.

Surg Infect (Larchmt). 2014 Oct 14. [Epub ahead of print]

[SIS Statement on Ebola Hemorrhagic Fever](#)

### Legislation:

n/a

### Campaigns and related activities:

n/a

### Press activities:

n/a

### Recent Publications:

#### REVIEWS

Vacuum-Assisted Closure versus Closure without Vacuum Assistance for Preventing Surgical Site Infections and Infections of Chronic Wounds: A Meta-Analysis of Randomized Controlled Trials

Giannoula S. Tansarli, Konstantinos Z. Vardakas, Constantinos Stratoulis, George Peppas, Anastasios Kapaskelis, Matthew E. Falagas  
Surgical Infections. August 2014, 15(4): 363-367.

Impact of Antimicrobial Skin Sealants on Surgical Site Infections  
Pascal M. Dohmen  
Surgical Infections. August 2014, 15(4): 368-371.

Acute Pyogenic Inguinal Abscess from Complex Soft-Tissue Infection or Intra-Abdominal Pathology  
Wei-Hsiu Hsu, Li-Ju Lai, Kuo-Ti Peng, Ching-Yu Lee  
Surgical Infections. October 2014, 15(5): 467-473.

Management of Infections in Critically Ill Patients  
Tjasa Hranjec, Robert G. Sawyer  
Surgical Infections. October 2014, 15(5): 474-478.

Proceedings of the First International Summit on Intestinal Anastomotic Leak, Chicago, Illinois, October 4–5, 2012  
Benjamin D. Shogan, Gary C. An, Hans M. Schardey, Jeffrey B. Matthews, Konstantin Umanskiy, James W. Fleshman Jr., Jens Hoepfner, Donald E. Fry, Eduardo Garcia-Granereo, Hans Jeekel, Harry van Goor, E. Patchen Dellinger, Vani Konda, Jack A. Gilbert, Gregory W. Auner, John C. Alverdy

Clostridium difficile Infection: Update on Diagnosis, Epidemiology, and Treatment Strategies  
Kathleen B. To, Lena M. Napolitano  
Surgical Infections. October 2014, 15(5): 490-502.

**Other items of note:**

n/a