

**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
November 8-9, 2017
Atlanta, Georgia**

Record of the Proceedings

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Healthcare Infection Control Practices Advisory Committee (HICPAC)

November 8-9, 2017

Centers for Disease Control and Prevention

Tom Harkin Global Communications Center (Building 19, Aud. B)

1600 Clifton Rd., NE, Atlanta, GA

Wednesday, November 8, 2017

Time	Topic	Purpose	Presider/Presenter (s)
9:00	Welcome and Introductions	Information	Daniel Diekema (HICPAC Co-Chair) Deborah Yokoe (HICPAC Co-Chair) Michael Bell (DFO, HICPAC; CDC)
9:15	CDC Updates: Division of Healthcare Quality Promotion (DHQP)	Information	Denise Cardo (DHQP)
9:45	NICU Guideline Workgroup Updates	Information/ Discussion	Kristina Bryant (HICPAC)
10:15	Break		
10:30	Healthcare Personnel Guideline Workgroup Update	Information/ Discussion	Hilary Babcock (HICPAC)
12:00	Lunch		
1:30	NHSN Workgroup Update	Information/ Discussion	Michael Howell (HICPAC) Deborah Yokoe (HICPAC)
2:30	HICPAC Workgroup Update: Recommendation Categorization Scheme Update	Information/ Discussion	Daniel Diekema (HICPAC) Deborah Yokoe (HICPAC)
3:15	Break		
3:30	Products and Practices Workgroup Update	Information/ Discussion	Lynn Janssen (HICPAC)
4:15	Public Comment		
4:30	Liaison/ Ex-officio Reports		
5:00	Adjourn		

Thursday, November 9, 2017

Time	Topic	Purpose	Presider/Presenter
9:00	Welcome and Roll Call	Information	Daniel Diekema (HICPAC Co-Chair) Deborah Yokoe (HICPAC Co-Chair) Michael Bell (DFO, HICPAC; CDC)
9:15	Respiratory Infection Transmission Precautions	Information/ Discussion	Michael Bell (DFO, HICPAC; CDC)
10:00	International Antimicrobial Resistance	Information	Denise Cardo (DHQP, CDC)
10:30	Break		
10:45	Modeling Update: Return on Investment	Information	John Jernigan (DHQP, CDC)
11:30	Public Comment		
11:55	Summary and Work Plan		
12:00	Adjourn		

Attendees

List of Attendees Day 1: November 8, 2017

HICPAC Members

Dr. Daniel Diekema, Co-Chair
Dr. Deborah Yokoe, Co-Chair
Dr. Hilary Babcock
Ms. Vickie Brown
Dr. Kristina Bryant
Dr. Vineet Chopra
Dr. Sheri Chernetsky-Tejedor
Ms. Loretta Fauerbach
Dr. Michael Howell
Dr. W. Charles Huskins
Ms. Lynn Janssen
Dr. Lisa Maragakis
Dr. Jan Patterson
Dr. Selwyn O. Rogers

ex officio Members

Ms. Elizabeth Claverie-Williams, Food and Drug Administration (FDA)
Dr. David Henderson, National Institutes of Health (NIH)
Dr. Melissa Miller, Agency for Healthcare Research and Quality (AHRQ)
Dr. Stephen Kralovic, US Department of Veterans Affairs (VA)
Dr. Daniel Schwartz, Centers for Medicare and Medicaid Services (CMS)
Ms. Yvonne Chow, Health Resources and Service Administration (HRSA)

Liaison Representatives

Ms. Maryellen Guinan, America's Essential Hospitals (AEH)
Dr. Mark Russi, American College of Occupational and Environmental Medicine (ACOEM)
Ms. Lisa Tomlinson, Association of Professionals of Infection Control and Epidemiology (APIC)
Dr. Emily Lutterloh, Association of State and Territorial Health Officials (ASTHO)
Dr. Marion Kainer, Council of State and Territorial Epidemiologists (CSTE)
Ms. Lisa McGiffert, Consumers Union (CU)
Ms. Linda Spaulding, DNVGL Healthcare
Dr. Stephen Weber, Infectious Disease Society of America (IDSA)
Dr. Jacqueline Lawler, National Association of County and City Health Officials (NACCHO)
Ms. Kathleen Dunn, Public Health Agency of Canada (PHAC)
Dr. Jason Kane, Society for Critical Care Medicine (SCCM)
Dr. Louise Demby, Society for Healthcare Epidemiology of America (SHEA)
Dr. Robert Sawyer, Surgical Infection Society (SIS)
Dr. Valerie Vaughn, Society of Hospital Medicine (SHM)
Ms. Margaret VanAmringe, The Joint Commission (TJC)

CDC Representatives

Fran Abanyie, CDC/DHQP	Shantel Benjamin, CDC/DHQP
Denise Albina, CDC/DHQP	Isaac Benowitz, CDC/DHQP
Matt Arduino, CDC/DHQP	Kathy Bridson, CDC/DHQP
Michael Bell, CDC/DHQP	Denise Cardo, CDC/DHQP

Sheralyn Chrisholm, CDC/DHQP
Koo-Whang Chung, CDC/DHQP
Amanda Clemons, CDC/DHQP
Areille Colon, CDC/DHQP
Kendra Cox, CDC/DHQP
Matthew Crist, CDC/DHQP
Dave Dagle, CDC/DHQP
Mahnaz Dasti, CDC/DHQP
Maggie Dudeck, CDC/DHQP
Christopher Elkins, CDC/DHQP
Ryan Fagan, CDC/DHQP
Nancy Gallagher, CDC/DHQP
Jeremy Goodman, CDC/DHQP
Rita Helfand, CDC/DHQP
Rosa Hererra, CDC/DHQP
Carissa Holmes, CDC/DHQP
Kathleen Irwin, CDC/DHQP
Karen Jones, CDC/DHQP
Agasha Katarawa, CDC/DHQP
Melissa Kornfeld, CDC/DHQP
Allison Laufer Halpin, CDC/DHQP
Ruth Link-Gelles, CDC/DHQP
Shelley Magill, CDC/DHQP
Anita McLees, CDC/DHQP
Kerri Moran, CDC/DHQP
Elizabeth Mothershed, CDC/DHQP
Duc. B. Nguyen, CDC/DHQP

Judith Noble-Wang, CDC/DHQP
Jim Nowicki, CDC/DHQP
Justin O'Hagan, CDC/DHQP
Abimola Ogundimu, CDC/DHQP
Margaret Paek, CDC/DHQP
Prabasaj Paul, CDC/DHQP
Kiran Perkins, CDC/DHQP
Antonio Perkins, CDC/DHQP
Joseph Perz, CDC/DHQP
Preeti Ravindhran, CDC/DHQP
Sujan Reddy, CDC/DHQP
Kristin Roberts, CDC/DHQP
Annie Rossetti, CDC/DHQP
Kate Russell, CDC/DHQP
Melissa Schaefer, CDC/DHQP
Rachel Smith, CDC/DHQP
Rachel Snyder, CDC/DHQP
Arjun Srinivasan, CDC/DHQP
Erin Stone, CDC/DHQP
Nimalie Stone, CDC/DHQP
Duane Stone, CDC/DHQP
Wendy Vance, CDC/DHQP
Ellen Wan, CDC/DHQP
Lauren Wattenmaker, CDC/DHQP
Kate Wiedeman, CDC/DHQP
Erikka Woolfolk, CDC/DHQP

Members of the Public

James W. Arbogast, GOJO Industries
Kay Argroves, American Association of Nurse Anesthetists
Steven Brash, Infection Control and Prevention Consulting
Nicole Bryan, Council of State and Territorial Epidemiologists
Kaitlin Carr Heath, Becton Dickinson
Giovanna Santonito Carducci, Healthcare Management Solutions
Pam Falk, Northside Hospital
John Hudson Garrett, Jr, Pentax Medical
Lori Harmon, Society of Critical Care Medicine
Mindy Hecht, Patient Shield Concepts, LLC
Leah Heimbach, Healthcare Management Solutions, LLC
Kendra Denise Hill-Foreman, Baylor Scott and White Health
Eve Humphreys, The Society for Healthcare Epidemiology of America
Kelley Leonette, Healthcare Management Solutions
Carmela Mascio, LivOnyx Inc.
Renee Odehnal, Ethicon US, LLC
Silvia Quevedo, Association for Professionals in Infection Control and Epidemiology
Maria Rodriguez, Xenex Disinfection Services
William Anthony Rutala, University of North Carolina School of Medicine
Rachel Stricof, Council of State and Territorial Epidemiologists
Keith St. John, PDI

Judy Trawick, Health Resources and Services Administration
Stephanie Henry Wallace, Cambridge Communications

List of Attendees Day 2: November 9, 2017

HICPAC Members

Dr. Daniel Diekema, Co-Chair
Dr. Deborah Yokoe, Co-Chair
Dr. Hilary Babcock
Ms. Vickie Brown
Dr. Kristina Bryant
Dr. Vineet Chopra
Dr. Sheri Chernetsky-Tejedor
Ms. Loretta Fauerbach
Dr. Michael Howell
Dr. W. Charles Huskins
Ms. Lynn Janssen
Dr. Lisa Maragakis
Dr. Jan Patterson
Dr. Selwyn O. Rogers

***ex officio* Members**

Ms. Elizabeth Claverie-Williams, Food and Drug Administration (FDA)
Dr. David Henderson, National Institutes of Health (NIH)
Dr. Melissa Miller, Agency for Healthcare Research and Quality (AHRQ)
Dr. Stephen Kralovic, US Department of Veterans Affairs (VA)
Dr. Daniel Schwartz, Centers for Medicare and Medicaid Services (CMS)
Ms. Yvonne Chow, Health Resources and Service Administration (HRSA)

Liaison Representatives

Ms. Maryellen Guinan, America's Essential Hospitals (AEH)
Ms. Lisa Tomlinson, Association of Professionals of Infection Control and Epidemiology (APIC)
Dr. Emily Lutterloh, Association of State and Territorial Health Officials (ASTHO)
Dr. Marion Kainer, Council of State and Territorial Epidemiologists (CSTE)
Ms. Lisa McGiffert, Consumers Union (CU)
Ms. Linda Spaulding, DNVGL Healthcare
Dr. Stephen Weber, Infectious Disease Society of America (IDSA)
Dr. Jacqueline Lawler, National Association of County and City Health Officials (NACCHO)
Ms. Kathleen Dunn, Public Health Agency of Canada (PHAC)
Dr. Jason Kane, Society for Critical Care Medicine (SCCM)
Dr. Louise Demby, Society for Healthcare Epidemiology of America (SHEA)
Dr. Robert Sawyer, Surgical Infection Society (SIS)
Dr. Valerie Vaughn, Society of Hospital Medicine (SHM)

CDC Representatives

Denise Albina, DHQP/CDC
Michael Bell, DHQP/CDC
Isaac Benowitz, DHQP/CDC
Denise Cardo, DHQP/CDC
Danielle Carter, DHQP/CDC

Bryan Christensen, DHQP/CDC
Koo-Whang Chung, DHQP/CDC
Kendra Cox, DHQP/CDC
Sarah Collins, DHQP/CDC
Michael Craig, DHQP/CDC

Dave Dagle, DHQP/CDC
Christopher Elkins, DHQP/CDC
Lauren Epstein, DHQP/CDC
Ryan Fagan, DHQP/CDC
Bill Greim, DHQP/CDC
Jeremy Goodman, DHQP/CDC
Rita Helfand, DHQP/CDC
Kathleen Irwin, DHQP/CDC
John Jernigan, DHQP/CDC
David Kuhar, DHQP/CDC
Cliff McDonald, DHQP/CDC

Anita McLees, DHQP/CDC
Elizabeth Mothershed, DHQP/CDC
Krista Powell, DHQP/CDC
Joseph Lutgring, DHQP/CDC
Kristin Rainisch, DHQP/CDC
Sujan Reddy, DHQP/CDC
Brajendra Singh, DHQP/CDC
Erin Stone, DHQP/CDC
Amy Valderrama, DHQP/CDC
Wendy Vance, DHQP/CDC
Kate Wiedeman, DHQP/CDC

Members of the Public

Steven Brash, Infection Control and Prevention Consulting
Kaitlin Carr Heath, Becton Dickinson
Lori Harmon, Society of Critical Care Medicine
Mindy Hecht, Patient Shield Concepts, LLC
Eve Humphreys, The Society for Healthcare Epidemiology of America
Carmela Mascio, LivOnyx Inc.
Renee Odehnal, Ethicon US, LLC
Silvia Quevedo, Association for Professionals in Infection Control and Epidemiology
Maria Rodriguez, Xenex Disinfection Services
Rachel Stricof, Council of State and Territorial Epidemiologists
Judy Trawick, Health Resources and Services Administration
Nancy Trick, Becton Dickinson
Stephanie Henry Wallace, Cambridge Communications

Executive Summary

The US 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 November 8-9, 2017, in Atlanta, Georgia. The Designated Federal Official (DFO) and Chair confirmed the presence of a quorum of HICPAC voting members and *ex officio* members, which was maintained throughout each day.

The meeting was called to order at 9:10 am on November 8, 2017. Dr. Denise Cardo provided updates from DHQP pertaining to the results of some of the Division's specialty investments in intramural and extramural research, and discussed how the Division connects those efforts. Dr. Kristina Bryant presented an update on the *Neonatal Intensive Care Unit (NICU) Infection Prevention Guideline*, with a focus on the Grading of Recommendations Assessment, Development and Evaluation (GRADE) methodology for Key Question 2, "Which anatomic sampling sites and laboratory assays most effectively identify *Staphylococcus aureus* (*S. aureus*) colonization in NICU patients?" Dr. Hilary Babcock presented an update on the *Guideline for Infection Control in Healthcare Personnel*, with a focus on the five key questions formulated to guide the literature search for *S. aureus* and the draft Pertussis recommendations and narrative. Dr. Michael Howell explained the rationale behind the establishment of the National Healthcare Safety Network (NSHN) Workgroup, outlined its charge and goals, and described the subgroups that have been established to address A) Definitions and Data and B) Reporting and Communications. Dr. Daniel Diekema provided an update on the proposed new HICPAC recommendation categorization scheme, including a description of the draft tables and categories for the overall strength of the recommendations, the justification for choice of recommendations, and the aggregate quality of the evidence. Ms. Lynn Janssen presented an update on the HICPAC Products and Practices Workgroup's progress on the development of an algorithm to guide HICPAC in product review and recommendations, including a discussion regarding the tenets the Workgroup is holding in developing this algorithm and a description of the draft decision nodes developed for the algorithm based on those tenets and what the Workgroup has learned about Food and Drug Administration (FDA) approval processes.

HICPAC stood in recess from 4:20 pm on November 8, 2017, until 9:12 am on November 9, 2017. Dr. Michael Bell discussed respiratory infection transmission precautions. He invited feedback on the burden of infectious individuals presenting to facilities, the seriousness of those infections, the secondary implications of uncontained infections, and the implications of greater investment in the use of respiratory protection and airborne isolation. Dr. Denise Cardo reported some of her activities related to international antimicrobial resistance. Dr. John Jernigan reviewed DHQP's past and current portfolio of return on investment (ROI) modeling projects and supporting work, as well as challenges and future directions in this field.

HICPAC stood in recess at 11:38 am on November 9, 2017.

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CENTERS FOR DISEASE CONTROL AND PREVENTION
National Center for Emerging and Zoonotic Diseases
Division of Healthcare Quality Promotion
Healthcare Infection Control Practices Advisory Committee (HICPAC)**

November 8-9, 2017
Atlanta, Georgia

DRAFT Minutes of the Meeting

The United States (US) 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 November 8-9, 2017, at the Tom Harkin Global Communications Center at the Centers for Disease Control and Prevention, 1600 Clifton Road NE, Atlanta, Georgia.

Wednesday, November 8, 2017

Welcome and Introductions

Michael Bell, MD
Deputy Director
Division of Healthcare Quality Promotion
National Center for Emerging and Zoonotic Infectious Diseases
Centers for Disease Control and Prevention
Designated Federal Official, Healthcare Infection Control Practices Advisory Committee

Daniel Diekema, MD, MS
Director, Division of Infectious Diseases
Department of Internal Medicine
University of Iowa Carver College of Medicine
Co-Chair, Healthcare Infection Control Practices Advisory Committee

Dr. Michael Bell called the meeting to order at 9:10 am and welcomed HICPAC members, *ex officio* members, and liaison representatives. He conducted a roll call, establishing that a quorum was present. Quorum was maintained throughout the day. HICPAC members disclosed the following conflicts of interest:

- Ms. Vickie Brown serves on an advisory committee for bioMérieux on antibiotic stewardship and blood culture collection.
- Dr. Kristina Bryant has been an investigator on clinical vaccine trials funded by Pfizer.
- Dr. Daniel Diekema has received research funding from bioMérieux.
- Dr. Michael Howell is employed by Google Research and has equity in the company.
- Ms. Lynn Janssen's husband is the Chief Medical Officer for a company that develops vaccines and immunotherapy products for cancer.
- Dr. Lisa Maragakis receives research funding from Clorox and Virtus.
- Dr. Jan Patterson's spouse has been a consultant on antifungals to Astellas, Gilead, Merck, and Scynexis.

Dr. Diekema recognized two HICPAC members who were attending their last meeting, as their membership terms are ending:

- Dr. Sheri Chernetsky-Tejedor
- Ms. Lynn Janssen

Dr. Bell provided them with a certificate and a letter of gratitude from CDC leadership. HICPAC members provide an important service not only to the agency and HICPAC, but also to the field, and their work and commitment are appreciated.

CDC Updates: Division of Healthcare Quality Promotion

Denise Cardo, MD

Director

Division of Healthcare Quality Promotion

National Center for Emerging and Zoonotic Infectious Diseases

Centers for Disease Control and Prevention

Dr. Denise Cardo provided updates on DHQP activities in four key areas:

- Outbreaks and Response and Containment
- State and Local Programs: Prevention
- Data Systems
- Innovation and Research.

She described DHQP's investments in intramural and extramural research and how the Division connects those efforts.

At this year's IDWeek™, 36 of the accepted posters and oral presentations were from the Prevention Epicenters, 32 were from DHQP staff, and more were from states and other groups that are funded by DHQP. The Division works collaboratively with the Prevention Epicenters to address gaps in prevention, outcomes, and understanding of infection transmission.

In the field of healthcare epidemiology, DHQP supports efforts not only to address gaps, but also to help grow the next generation of professionals. Working with partners is an important way to help people grow in their professional careers as well as to drive research questions. In the past, most of DHQP's IDWeek™ presentations focused on outbreaks and surveillance; it was refreshing this year to see presentations about modeling, costs, and laboratory innovation to:

- Identify new mechanisms of transmission and new technology, such as whole genome sequencing (WGS).
- Address the microbiome and environmental issues for healthcare as well as strategies to address these prevention gaps, stewardship, and understanding personal protective equipment (PPE).

More than \$9 million was awarded to 25 investigators under the Fiscal Year (FY) 2017 Broad Agency Announcement (BAA). The BAA is a mechanism for CDC to work not only with academic partners and public health agencies, but with other groups and organizations to address specific questions. The BAA is different from the Prevention Epicenter program, in which funding is allocated through a cooperative agreement and CDC and awardees work

together to consider questions and ways to address them. Through the BAA, CDC poses questions, and recipients help explore knowledge gaps and then determine and pilot potential solutions. BAA funding is typically for 1 to 2 years. Applicants submit white papers in response to CDC's publication of the announcement. More than 200 white papers were submitted in response to the FY '17 announcement. Given the level of funding, many of these strong proposals were not funded.

CDC's Antimicrobial Resistance (AR) Innovation Portfolio explores knowledge gaps and innovative solutions regarding antibiotic resistance related to the human microbiome, environment, healthcare settings, and surface water and soil. DHQP works with health departments and healthcare organizations to implement what is known, and with Prevention Epicenters and academic groups to address innovations. This BAA focuses on:

- Investigating the human microbiome to identify prevention strategies that protect people, their microbiomes, and the effectiveness of antibiotics.
- Identifying and evaluating new strategies that protect patients from resistance threats in healthcare settings and improve healthcare quality.
- Examining the impact of antibiotic resistance elements in environmental settings, such as surface water and soil.

Additional information about each of the proposals and groups can be found on CDC's [Antibiotic / Antimicrobial Resistance website \(https://www.cdc.gov/drugresistance/solutions-initiative/innovations-to-slow-AR.html\)](https://www.cdc.gov/drugresistance/solutions-initiative/innovations-to-slow-AR.html). The list of FY2017 BAA awardees illustrates the scope of the different organizations innovating and leading the field:

- Baylor College of Medicine
- Children's Hospital Oakland Research Institute at the University of California San Francisco
- Cleveland VA Medical Research and Education Foundation
- Department of Research & Evaluation, Kaiser Permanente Southern California
- Emory University
- Georgia Tech Applied Research Corporation (2 projects)
- Health Services Advisory Group, Inc.
- Infectious Diseases Society of America
- J. Craig Venter Institute
- Medical Research Analytics & Informatics Alliance
- OpGen, Inc.
- Regents of the University of Michigan
- Rutgers, the State University of New Jersey
- The Children's Hospital of Philadelphia
- The Ohio State University
- The Rector and Visitors of the University of Virginia
- The University of Georgia
- Translational Genomics Research Institute
- University of Alabama at Birmingham
- University of Arizona
- University of Georgia Research Foundation, Inc.
- University of Maryland, Baltimore
- University of Mississippi Medical Center

- Washington University

Dr. Cardo highlighted collaborations with the Infectious Disease Society of America (IDSA), the Society for Healthcare Epidemiology of America (SHEA), and the Pediatric Infectious Diseases Society (PIDS), which have been awarded a contract to establish an Antibiotic Stewardship and Resistance Innovative Fellowships (ASRIF) program. This fellowship for infectious disease physicians will bridge clinical infectious disease and public health work in the areas of:

- Antibiotic resistance and antibiotic stewardship;
- Building and connecting expertise in public health and healthcare; and
- Advancing innovative approaches to combat antibiotic resistance and promote stewardship and public health.

Through the Modeling Infectious Diseases in Healthcare Network (MInD-Healthcare), researchers are using modeling to investigate factors that drive the spread of healthcare-associated infection (HAIs), and simulating prevention strategies to estimate their benefits. The following are a few examples of the types of modeling being done through Modeling Infectious Diseases in Healthcare ([MInD-Healthcare](https://www.cdc.gov/hai/research/MIND-Healthcare.html)) (<https://www.cdc.gov/hai/research/MIND-Healthcare.html>):

- Use of patient flow and health economic data to support decisions about outbreak control interventions and to prevent transmission of resistant pathogens
- Assessment of patient movement through areas of high risk for carbapenem-resistant *Enterobacteriaceae* (CRE) and *Clostridium difficile* (*C. difficile*) transmission, including hospitals and long-term care facilities (LTCF)
- Assessment of the effectiveness of hospital-based interventions through the simulated spread of HAIs
- Analysis of the effectiveness of specific contact precaution policies in conjunction with hand hygiene initiatives
- Use of data to inform regional health policy decisions for hospital interventions by examining transfer of patients between facilities

CDC's Antibiotic Resistance Solutions Initiative continues to focus on patient safety. CDC's containment strategy includes a systematic approach to slow the spread of novel or rare multidrug-resistant organisms (MDROs) or mechanisms through an aggressive response to a single case. Specific, targeted threats include carbapenemase-producing organisms, pan-resistant organisms, and *Candida auris* (*C. auris*). Response tiers are based on threat. More threats could be added to this list as CDC continues to work to understand how transmission occurs and to control and contain transmission. The situation is dynamic. In the past, CDC had to wait to be informed about an infection or transmission of infection before an investigation could begin. With new investment in the Antimicrobial Resistance Laboratory Network (AR Lab Network), comprised of state and regional laboratories, it is possible to test CREs quickly and to find new mechanisms of resistance. As soon as a new mechanism is detected, assessments can be conducted to determine potential spread and to implement strategies for containment. [Interim Guidance for a Health Response to Contain Novel or Targeted Multidrug-resistant Organisms \(MDROs\)](https://www.cdc.gov/hai/outbreaks/mdro) is available on CDC's website: www.cdc.gov/hai/outbreaks/mdro.

As part of the containment strategy, CDC is aggressively responding to CRE and carbapenem-resistant *Pseudomonas aeruginosa* (CRPA). Between January 1 and August 31, 2017, 2669 CRE and 879 CRPA specimens were submitted to the AR Lab Network:

- 832 (33%) CRE and 14 (1.5%) CRPA were carbapenemase-producers
- 90 (11%) CRE and 13 (92%) CRPA of carbapenemases were non-*Klebsiella pneumoniae* Carbapenemase (KPC)

CDC consulted on 60 investigations of carbapenemase-producing organisms across 26 states. In this process, 799 healthcare contacts were screened, and 39 (5%) were found to be asymptotically colonized.

- 3/155 (2%) of contacts screened in short-stay acute care hospitals were colonized
- 35/439 (8%) of contacts screened in post-acute care settings were colonized

These investigations illustrate the need to learn about new modes of transmission and reservoirs. Information about newly-identified modes will help decrease and prevent transmission. Healthcare settings such as LTCFs, especially ventilator-skilled nursing facilities, are amplifiers of multidrug-resistant organism (MDRO) transmission. This point is critical because it demonstrates the importance of considering the spectrum of healthcare settings. Resistant microorganisms do not respect the borders of US facilities and states, or of other countries. CDC is therefore pursuing global perspectives to address transmission.

In 2014, CDC called on all US hospitals to implement an antibiotic stewardship program. CDC created the “Core Elements of Hospital Antibiotic Stewardship Programs” to outline the structures and functions associated with effective programs. The Core Elements were used by:

- The Joint Commission (TJC) for their antibiotic stewardship standard
- Centers for Medicare & Medicaid Services (CMS) in funding the Hospital Improvement Innovation Networks (HIINs) and other groups
- Agency for Healthcare Research and Quality (AHRQ) in the development of a Comprehensive Unit-based Safety Program (CUSP) Toolkit

CDC worked with the National Quality Forum (NQF) to develop a practical implementation “playbook.” CDC is also assessing implementation of the Core Elements through the annual National Healthcare Safety Network (NHSN) hospital survey and is supporting state implementation of the elements. This work is helping facilities across the country build and support antibiotic stewardship programs.

While an overall increase was observed in the number of US hospitals implementing the Core Elements, critical access hospitals had the lowest rate of implementation. CDC responded by working with the Health Resources and Services Administration (HRSA) Federal Office of Rural Health Policy (FORHP), the Pew Charitable Trusts, the American Hospital Association® (AHA®), and other groups to develop tailored implementation guidance for small and critical access hospitals titled “[Implementation of Antibiotic Stewardship Core Elements at Small and Critical Access Hospitals](https://www.cdc.gov/antibiotic-use/healthcare/pdfs/core-elements-small-critical.pdf)” (<https://www.cdc.gov/antibiotic-use/healthcare/pdfs/core-elements-small-critical.pdf>). Now through HRSA’s Flex Program, small and critical access hospitals can implement stewardship programs and report that information through NHSN. CDC is working with its federal agency partners to imbed antibiotic stewardship principles in the field so that stewardship is an expectation for all healthcare settings. At the same time, CDC is creating and providing tailored guidance for implementation of those strategies.

Relatively little is known about antibiotic use in nursing homes, but CDC has continued to work to improve use. CDC released “[The Core Elements of Antibiotic Stewardship for Nursing](#)”

Homes” in 2015 (<https://www.cdc.gov/longtermcare/pdfs/core-elements-antibiotic-stewardship.pdf>). CMS finalized its Long-Term Care (LTC) Requirements of Participation (RoP) in October 2016, requiring antibiotic stewardship to be incorporated into their infection prevention and control programs and pharmacy services. CDC worked with CMS to develop interpretative guidance for the RoP; the guidance was released in July of 2017. The CMS Quality Innovation Network and Quality Improvement Organizations (QIN-QIOs) recruited nursing homes to implement CDC’s Core Elements, and CDC is supporting implementation through expert input and tools.

CDC continues to work with key professional organizations to determine how to use data for improvement in antibiotic use in outpatient settings. CDC is also:

- making antibiotic use data in outpatient settings available to state partners for local action;
- working with partners to improve antibiotic use in dental offices, retail clinics, and urgent care centers; and
- identifying the best targets (e.g., specific antibiotics, patient and provider populations) for implementation.

CDC is working with CMS to develop an interactive stewardship course to be delivered through the CMS Merit-Based Incentive Payment System (MIPS), with incentives for providers to take the course. CDC is working with partners to guide improvements and implement interventions by providing technical assistance to the Quality Improvement Organizations (QIOs) implementing the Core Elements in over 7500 outpatient facilities. Additional efforts include working with private payers to implement interventions, such as audit and feedback letters to physicians prescribing antibiotics for acute uncomplicated bronchitis.

CDC’s initiative to improve education on antibiotic use has been renamed “Be Antibiotics Aware: Smart Use, Best Care.” The new educational effort builds on the “Get Smart” initiative, refining messaging and expanding to new target audiences, focusing on:

- patient safety: unnecessary antibiotics cause preventable harm
- increased messaging for adult patients
- a new effort to reach hospitalists, nurse practitioners, and physician assistants.

“US Antibiotic Awareness Week” is November 13-19, 2017, and addresses the need to provide information on antibiotic use, especially to patients. It aligns with the World Health Organization’s (WHO) “World Antibiotic Awareness Week” and the European Centre for Disease Prevention and Control’s (ECDC) “European Antibiotic Awareness Day.”

Dr. Cardo turned to DHQP’s work in sepsis. A goal in this area is to develop a more stable, objective definition of sepsis that can be used to track it over time. With the cooperation of the CDC Prevention Epicenters, the Journal of the American Medical Association (JAMA) recently published “Incidence and Trends in Sepsis in US Hospitals Using Clinical vs Claims Data, 2009-2014.” The study results indicate an estimated 1.7 million cases of sepsis among adult patients, and nearly 270,000 deaths. Further, 22% of patients with sepsis either did not survive their hospitalization or went from the hospital to hospice. Sepsis was present in nearly 1/3 of all hospitalizations that ended in death. Efforts are underway with the Emerging Infections Program (EIP) to determine how to apply sepsis definitions to children to reach a reliable assessment of the sepsis burden in the pediatric population.

CDC launched the [Get Ahead of Sepsis](https://www.cdc.gov/sepsis/get-ahead-of-sepsis/index.html) campaign (<https://www.cdc.gov/sepsis/get-ahead-of-sepsis/index.html>), an educational initiative to protect Americans from the devastating effects of sepsis. This initiative emphasizes the importance of:

- early recognition,
- timely treatment,
- reassessment of antibiotic needs, and
- prevention of infections that could lead to sepsis.

The anticipated outcomes are:

- increased awareness of the need for early recognition and prompt treatment, and
- increased awareness of preventing infections that can lead to sepsis.

This initiative is an opportunity to merge messages. There has been a perception that the sepsis and stewardship messages were conflicting; now, sepsis is part of stewardship, and vice versa. The ultimate goal of this work is a good outcome for the patient. The core messages for healthcare professionals are:

- You can protect your patients by recognizing and treating sepsis quickly.
- Know your facility's existing guidance for diagnosing and managing sepsis. If you suspect sepsis:
 - Immediately alert the clinician in charge if it is not you.
 - Start antibiotics as soon as possible, in addition to other therapies appropriate for the patient.
 - Check patient progress frequently. Reassess antibiotic therapy within 24-48 hours to stop or adjust therapy if needed. Be sure antibiotic type, dose, and duration are correct.
- Sepsis is a medical emergency. Protect your patients by acting fast. Your patient's risk of death increases with delayed recognition and treatment of sepsis.

The national and international momentum on antibiotic resistance continues, and the healthcare piece of this work is important. In the past four years, the message has been strong that new antibiotics are critical, but it is also important to prevent infections and improve the use of existing antibiotics. Dr. Cardo emphasized that all of the groups represented at this HICPAC meeting must continue to be involved, because messages are easily forgotten. The Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria (PACCARB) was renewed, and the hope is that PACCARB's connection with HICPAC will continue, especially now that PACCARB has created a Workgroup to address stewardship and infection prevention. In addition, antibiotic resistance will continue to be a topic in the 2018 United Nations (UN) General Assembly meeting.

CDC's approach to addressing antibiotic resistance remains centered on the principles of: detect, respond, prevent, and innovate. Improvements and data make it possible to be more aggressive and targeted.

In closing, Dr. Cardo announced staffing changes at DHQP:

- Alexander J. Kallen, MD, MPH, who previously served as a Team Lead in the Prevention and Response Branch, is now the Chief of that branch.

- Christopher A. Elkins, PhD, comes to CDC from FDA and now serves as the Chief of the Clinical and Environmental Microbiology Laboratory.

Discussion Points

HICPAC asked about the possibility of moving toward near-real-time, actionable communications to healthcare facilities regarding the CRE data, mechanisms to communicate the data, and patterns in the data.

Dr. Cardo emphasized that communicating data back to facilities so that they can act is critical. Health departments can work more closely with facilities in this process. Ideas about how to improve data communication are welcome. Greater collaboration with the investments made in the health departments, the EIP program, and Prevention Epicenters illustrate how connections can improve information use, not only for individual projects, but also for action. Dr. Kallen is leading this effort at DHQP. Additionally, fellows in the ASRIF program can play a role in bridging health departments and healthcare facilities.

The National Institutes of Health (NIH) commented on CRE and the environment. In the early days of healthcare epidemiology, there was a major swing toward the environment; the focus then shifted, but there now appears to be a swing back in that direction. It is possible that as “person-related” infection prevention and control issues are addressed, the environment is returning to the forefront. A focus on the environment in the next decade will make hospitals much safer. All institutions should consider the role the environment plays. The landscape of what needs to be done starts at the basic science level of how biofilms work in drains and sewers, and the impact of actions such as pouring certain things down the drain, such as soft drinks.

Dr. Cardo indicated that work on environmental plumbing has been conducted by CDC with the University of Virginia, which has a sink laboratory. CDC is developing a sink laboratory and working to understand the microbial dynamics and to better assess the degree of contamination of the environment. Understanding the biofilm is important. Even if there is not a perfect way of assessing the environment, creating standards will allow for comparisons and improvements over time. With the investments resulting from Ebola, the environment has been a major focus of many Epicenter projects. The ability to conduct WGS and identify connections in healthcare - with devices or the environment - is a reflection of those investments.

America’s Essential Hospitals (AEH) inquired about the timeline for incorporating stewardship efforts into the MIPS and CDC’s role in the process. Many facilities do not have many resources apply to “check the box” measures, so it would be beneficial if their current efforts could be counted.

Dr. Cardo replied that CDC is working with several groups to determine how to provide tools to help hospitals implement programs. It is clear that critical access and small hospitals cannot implement programs like larger hospitals can, so numerous options are being considered. The MIPS focuses on clinicians. CDC is working with CMS to conduct training and is developing modules to help clinicians improve antibiotic use. CDC is assessing all existing avenues to provide needed tools and education. Additional suggestions are welcome.

Neonatal Intensive Care Unit (NICU) Guideline Workgroup Update

Kristina Bryant, MD
Chair, NICU Guideline Workgroup

**Division of Pediatric Infectious Diseases
University of Louisville School of Medicine**

Dr. Bryant presented an update on the activities of the HICPAC Workgroup focused on the *Guideline for Infection Prevention in Neonatal Intensive Care Unit (NICU) Patients*.

Previous HICPAC meetings have included discussion regarding the *C. difficile* section of the Guideline. The available evidence does not support making recommendations about *C. difficile*; therefore, the *C. difficile* component of the Guideline is presented as a systematic review. The document is currently undergoing a final review. A HICPAC vote on this section is anticipated in February 2018, followed by publication on the CDC website. The Workgroup continues to work with partners, including SHEA, to develop a “practical strategies” companion document to address some of the questions regarding *C. difficile* that clinicians face every day.

Work is ongoing on the *Staphylococcus aureus* (*S. aureus*) section of the Guideline. Initially, this section focused on methicillin-resistant *Staphylococcus aureus* (MRSA). Based on feedback from HICPAC, the Key Questions have been updated to incorporate not only MRSA, but also *S. aureus* as a whole. The literature search was expanded in February 2017 to include methicillin-sensitive *Staphylococcus aureus* (MSSA). The initial and revised Key Questions are:

2012 Key Question 1:

What are the risk factors for MRSA colonization and infection in NICU patients?

November 2017 Key Question 1:

- 1.1 What are the risk factors for endemic *S. aureus* infection in NICU patients? Do these factors differ between MRSA and MSSA? Do these factors differ in the setting of an outbreak?
- 1.2 What are the risk factors for endemic MRSA colonization in NICU patients? Do these factors differ in the setting of an outbreak?
- 1.3 What are the risk factors for endemic MSSA colonization in NICU patients? Do these factors differ in the setting of an outbreak?

2012 Key Question 2:

What are the most effective strategies to screen for MRSA colonization in NICU patients?

November 2017 Key Question 2:

Which anatomic sampling sites and laboratory assays most effectively identify *S. aureus* colonization in NICU patients?

2012 Key Question 3:

What are the most effective measures to prevent hospital-acquired infection or colonization with MRSA?

November 2017 Key Question 3:

What are the most effective strategies for preventing *S. aureus* transmission from

colonized or infected NICU infants to other patients? Do these strategies differ between MRSA and MSSA or in the setting of an outbreak?

When the literature search was expanded to include MSSA, an additional 888 potentially relevant articles were screened.

- 136 articles were selected for full text review
- 6 articles were selected for data extraction

Data extraction is ongoing:

- 18 articles have been extracted for Key Question 1
- 5 articles have been extracted for Key Question 2
- 20 articles have been extracted for Key Question 3

Dr. Bryant presented the evidence for Key Question 2, “Which anatomic sampling sites and laboratory assays most effectively identify *S. aureus* colonization in NICU patients?”

The literature search retrieved 4 diagnostic studies that addressed MRSA and 1 that addressed *S. aureus*. The overall quality grades in the GRADE methodology are:

Category	Description
High	Further research is <i>very unlikely</i> to change confidence in the estimate of effect
Moderate	Further research is <i>likely</i> to impact confidence in the estimate of effect and <i>may change</i> the estimate
Low	Further research is <i>very likely</i> to impact confidence in the estimate of effect and is <i>likely</i> to change the estimate
Very Low	Any estimate of effect

In the GRADE methodology, diagnostic studies are considered to be high-quality, and observational studies are considered to be of lower quality. Certain factors can affect the overall grading of the evidence. Factors that lower the quality of evidence include:

- Study quality (risk of bias)
- Limitations
- Inconsistency
- Indirectness
- Imprecision
- Publication bias.

Factors that can increase the quality of evidence include:

- A large magnitude of effect
- Dose-response
- Confounding.

The overall GRADE of evidence for Key Question 2 was moderate.

The evidence summary for *S. aureus* laboratory assays comparing real-time polymerase chain reaction (RT-PCR) to detect *S. aureus* compared to culture consists of 1 diagnostic study by Paule, published in 2004, that had overall moderate-quality evidence.¹ This study demonstrated that PCR (96%) had higher sensitivity compared to culture (92%). Further, there was moderate quality of evidence demonstrating identical specificity (100%) and positive predictive value (PPV) (100%) and similar negative predictive value (NPV) (98%) when PCR was compared to culture.

Two diagnostic studies compared RT-PCR to culture to detect MRSA. Francis, published in 2010, focused on routine screening;² Sarda, published in 2009, focused on screening during an outbreak investigation.³ The overall quality of evidence was moderate. There was high-quality evidence supporting higher sensitivity (100%), specificity (97%-98%), and NPV (100%) for PCR. There was a moderate-quality evidence of low PPV (41%-52.4%), with fairly wide confidence intervals. One study identified 7 MRSA-positive samples using PCR that subsequently tested negative by culture. Of those 7 samples, 5 were determined to be MSSA.

The second part of Key Question 2 focuses on which anatomic sampling sites most effectively identify *S. aureus* colonization in NICU patients. MRSA can be detected via sampling the nares, rectum, axilla, umbilicus, and the postauricular area. These questions were addressed by 2 diagnostic studies: Singh, published in 2003,⁴ and Huang, published in 2006.⁵ Moderate-quality evidence from these 2 diagnostic studies suggested that sensitivity is higher for samples obtained from the nares (95.8%-71%) than from other anatomic sites. Singh reported sensitivity for:

- Nares: 95.8%
- Rectum: 29.2%
- Axilla: 22.2%
- Umbilicus: 0%

Huang reported sensitivity for nares alone at 71% and umbilicus alone at 60%; however, there was a suggestion that sensitivity could increase to 90% if both sites were sampled.

The current CDC and HICPAC Recommendation Categorization Scheme is:

Category	Recommendation
Category IA	A <u>strong</u> recommendation supported by <u>high to moderate quality evidence</u> suggesting net clinical benefits or harms.

¹ Paule SM, Pasquariello AC, Hacek DM, et. al, Direct Detection of Staphylococcus aureus from Adult and Neonate Nasal Swab Specimens Using Real-Time Polymerase Chain Reaction. *J Mol Diagn.* 2004;6(3) 191-196

² Francis ST, Rawal S, Roberts H, Riley P, Planche T, Kennea NL. Detection of methicillin-resistant staphylococcus aureus (MRSA) colonization in newborn infants using real-time polymerase chain reaction (PCR). *Acta Paediatrica.* 2010;99(11):1691-1694

³ Sarda V, Molloy A, Kadkol S, Janda WM, Hershow R, McGuinn M. Active surveillance for methicillin-resistant Staphylococcus aureus in the neonatal intensive care unit. *Infect Control Hosp Epidemiol.* Sep 2009;30(9):854-860

⁴ Singh K, Gavin PJ, Vescio T, et al. Microbiologic surveillance using nasal cultures alone is sufficient for detection of methicillin-resistant Staphylococcus aureus isolates in neonates. *J Clin Microbiol.* Jun 2003;41(6):2755-2757

⁵ Huang YC, Chou YH, Su LH, Lien RI, Lin TY. Methicillin-resistant Staphylococcus aureus colonization and its association with infection among infants hospitalized in neonatal intensive care units. *Pediatrics.* Aug 2006;118(2):469-474

Category	Recommendation
Category IB	A <u>strong</u> recommendation supported by <u>low-quality evidence</u> 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 <u>strong</u> recommendation <u>required by state or federal regulation</u> .
Category II	A <u>weak</u> recommendation supported by <u>any quality evidence</u> suggesting a tradeoff between clinical benefits and harms.
No Recommendation	An <u>unresolved issue</u> for which there is <u>low to very low-quality evidence</u> with <u>uncertain tradeoffs</u> between benefits and harms.

HICPAC is considering revising its categorization scheme for recommendations; it may be necessary to consider which scheme will be used for the NICU guideline. The scheme used for *S. aureus* should be utilized in all sections of the document. Dr. Bryant emphasized that the draft recommendations as presented were developed using the current scheme. Ultimately, there will be two recommendations: one will address laboratory assays, and the other will address anatomic sampling sites.

Two draft recommendation options are proposed for *Key Question 2: Laboratory Assays*:

Use real-time polymerase chain reaction to detect *S. aureus* colonization in neonatal intensive care unit patients. Culture-based detection methods are an alternative to PCR to detect *S. aureus* colonization in neonatal intensive care unit patients, if access to PCR is not accessible or if susceptibility results for other antibiotics are needed. (Category IA) (See Implementation Considerations)

OR

Use molecular-based detection methods, such as real-time polymerase chain reaction, or culture-based detection methods depending on the needs of the neonatal intensive care unit to detect *S. aureus*. (Category IA) (See Implementation Considerations)

The Workgroup proposes these draft recommendations based on the quality of the evidence supporting laboratory assays and sampling sites. The recommendations address which laboratory assays most effectively identifies *S. aureus*. The recommendations are not meant to recommend screening all patients, but the Key Question does not address when to screen for MRSA or *S. aureus* in general, or whom to screen. If these recommendations are taken out of context, they could potentially be interpreted as stating that all patients should be screened for *S. aureus* using PCR or culture. The Implementation Considerations section of the document can provide additional detail regarding when to screen, whom to screen, when to look for MRSA, and when to look for all *S. aureus*. HICPAC’s feedback is welcomed regarding whether additional language is needed to indicate, “If you screen, use PCR to detect *S. aureus* colonization.”

The proposed draft recommendation for *Key Question 2: Anatomic Sampling Sites* is:

When testing for *S. aureus* colonization in neonatal intensive care unit patients, collect samples from at least the anterior nares. Axilla, rectum, and umbilicus samples may also be added to nares samples to increase sensitivity. (Category 1A)

The next section that the Workgroup will address focuses on central line-associated bloodstream infection (CLABSI) in NICUs. The Key Questions are:

2012 Key Question:

What are the most effective strategies to prevent central line-associated bloodstream infection in neonatal intensive care units?

November 2017 Key Question:

What are the most effective strategies to prevent central line-associated bloodstream infection in neonatal intensive care unit patients?

Dr. Bryant thanked the Workgroup and recognized the extensive contributions of Workgroup member Dr. Alexis Elward throughout the life of the NICU Guideline project.

Discussion Points

Draft Recommendations for Key Question 2: Laboratory Assays

Some HICPAC members felt that the wording of the second option was not sufficient, especially if all users do not read the Implementation Considerations.

- The recommendation regarding anatomic sites addresses which site to test, when testing is conducted. Adding language to this effect to the laboratory testing recommendation may provide clarity.

Concern was expressed that the first option for laboratory testing seemed to suggest that if NICUs are doing this at all, they should be using PCR.

- Pragmatically, PCR is not available to all NICUs. The wording of the recommendation may lead to some NICUs feeling obligated to use PCR, even if they have not done so before.
- From a practical perspective, it is not clear whether one test versus the other will make a difference. The specificity/sensitivity margins do not appear to be significantly different between them. It is potentially problematic to make a strong Category 1A recommendation implying that facilities should “abandon culture and use PCR.”
- If either test works in practice, language could be added to state that testing to detect colonization is important; to describe the two methods; to outline the pros and cons of each method; and to indicate that NICUs are at liberty to choose which method to use. Other details, such as the potential need for susceptibility information, could be provided.

There was support for the second draft option for laboratory assay detection, using language such as “When you are testing, use one of these two methods” and incorporating language from the first option to point out factors to consider in test selection, such as access, the need to detect MSSA in addition to MRSA, broader susceptibility assessment, etc.

Even if PCR is used, there are good reasons to culture the organisms as well to gather information for transmission investigations, WGS, and other needs.

HICPAC suggested adding a footnote directing readers to the Implementation Considerations or stating that the question of when to do the screening is beyond the scope of this document.

A HICPAC member reminded the group that several studies show that an overnight broth enrichment step can increase culture sensitivity by 15% to 20%.

- The Workgroup did not discuss broth enrichment in its deliberations. It is likely that studies looking at broth enrichment did not meet the inclusion criteria – NICU populations only – for this Key Question. Broth enrichment can be discussed in the Implementation Considerations.

Dr. Yokoe summarized that there appeared to be consensus regarding:

- adding language to specify that HICPAC is not recommending performing surveillance cultures in all instances, and that this recommendation is only applicable when the situation calls for it; and
- favoring the second bullet, suggesting that there is comparability between PCR and culture-based testing.

Draft Recommendations for Key Question 2: Anatomic Sampling Sites

HICPAC noted the striking span of 0% recovery from umbilicus samples versus 60% from nares samples. This difference may point out the limitations of a small number of publications.

- Perhaps multi-site sampling and/or a composite culture could be conducted to detect colonization.
- This concept is addressed in the second sentence of the anatomic sampling site recommendation regarding combining cultures.
- In practice, some NICUs perform composite sampling, but the Workgroup was not able to make a specific recommendation about this approach using the GRADE criteria.
- This important point and additional clarifications could be provided in the Implementation Considerations.

Dr. Yokoe summarized that HICPAC appeared to have reached consensus that the anatomic sampling site recommendation was agreeable as written.

General Comments

There was discussion regarding cost, which is a concern.

- At this time, HICPAC does not have a mechanism in place to address cost systematically and effectively.
- Addressing cost considerations on an ad hoc basis would be problematic.
- DHQP is growing its health economics and modeling capabilities. That level of rigor will be needed in order for HICPAC to make statements about cost.
- There is not necessarily a gold standard for measuring cost, which can be calculated in many different ways.
- Cost encompasses factors beyond the dollar amount associated with a given test.
- Cost is a complicated construct, especially in a formal literature-based GRADE methodology. However, it would be disingenuous for HICPAC not to acknowledge that cost affects decision-making at the individual facility level. Further, different cost pressures exist in different settings, and cost analyses vary in different settings based on factors such as:
 - NICU size,

- likelihood of finding MRSA/MSSA,
- frequency of outbreaks,
- risk of transmission,
- throughput and support in the laboratory.
- In general, the extracted studies reviewed by the Workgroup did not report cost. The Workgroup was therefore unable to make a statement about cost within the GRADE framework. Issues associated with cost could be addressed in the Implementation Considerations.

Consumers Union (CU) noted that from a layperson's viewpoint, it seems like RT-PCR should be a priority for the vulnerable NICU population, for whom every hour counts. Millions of dollars are spent to keep these patients alive. It seemed strange to focus on the cost of the tests to detect whether colonization or infection exists. A hospital that has invested in a NICU should have access to rapid laboratory results.

- The discussion of time to result could perhaps be incorporated into the discussion. If the recommendations were taken out of the context of the document, it could imply that RT-PCR yields results more quickly than culture, which may not be true depending upon the facility, if selective media is used, when the laboratory actually runs the PCR test, and if the tests are batched, among other considerations.
- Additionally, the calculus for screening for colonization is different from the calculus for screening for infection. This document does not address evaluation for infection.

Healthcare Personnel Guideline Workgroup Update

Hilary M. Babcock, MD, MPH

**Chair, HICPAC Healthcare Personnel Guideline Workgroup
 Medical Director, BJC Infection Prevention and Epidemiology Consortium
 Medical Director of Occupational Health (Infectious Diseases)
 Barnes-Jewish and St. Louis Children's Hospitals
 Associate Professor of Medicine, Infectious Disease Division
 Washington University School of Medicine**

Dr. Babcock provided an update on the work of the HICPAC Infection Control in Healthcare Personnel Workgroup.

The *Guideline for Infection Control in Healthcare Personnel, 1998* provided recommendations for reducing transmission of infections among healthcare personnel and patients in healthcare settings. The Workgroup's charge is to provide information on infection control for healthcare personnel to support an update of The Guideline's *Section 2: Epidemiology and Prevention of Selected Infections Transmitted Among Healthcare Personnel and Patients*, which focuses on specific pathogens. The Workgroup is particularly focused on identifying areas where information in the 1998 Guideline is out of date. The Workgroup charge states that the group will make updates using evidence-based methods where evidence is available; however, data are limited regarding risk of transmission among healthcare personnel and between healthcare personnel and patients.

Section 1: Infrastructure and Routine Practices for Occupational Infection Prevention Services is complete. That section was reviewed and discussed with HICPAC and is currently in CDC clearance. The next step will be to incorporate the edits from the clearance process.

The methodology for updating the pathogen-specific sections of the 1998 Guideline differs from the process utilized for prior guideline updates. The Workgroup reviews the 1998 recommendations and text for each pathogen. The Workgroup identifies elements of the 1998 Guideline that can be deleted, updated, or that still apply. Specifically, the Workgroup looks for:

- Outdated recommendations that are already updated elsewhere, such as in Advisory Committee on Immunization Practices (ACIP) recommendations;
- Areas in which there are significant gaps between the 1998 recommendations and current practices;
- Areas in which new data or literature are available that can inform updated recommendations; and
- Areas of need, where the 1998 Guideline does not address a common issue or area of concern.

CDC subject matter experts (SMEs) for each pathogen are engaged to provide feedback on current guidelines and guidance, needed updates, available literature, and gaps. This review process informs whether a systematic review or an informal review is conducted, and how new literature is incorporated into the update.

The updates to some pathogen sections will require a formal and structured literature review, with Key Questions shaping the recommendations. The Workgroup is creating open-ended Key Questions to inform areas where guidance is needed and to yield recommendations that can be broader than a “yes or no answer.” For pathogens with little to no new information, data, or literature, recommendations will be based on less formal reviews, expert opinion, and other relevant guidelines, as well as harmonization with existing recommendations. The Workgroup is aiming for practical, thoughtful guidance when there is little directly applicable literature.

The pathogens included in the 1998 guideline are:

- Bloodborne Pathogens (HIV, Hepatitis B, Hepatitis C)
- Conjunctivitis
- Cytomegalovirus
- Diphtheria
- Acute gastrointestinal (GI) Infections (Norovirus, *C. difficile*, others)
- Hepatitis A
- Herpes Simplex
- Measles
- Meningococcal Disease
- Multidrug-Resistant Gram-Negative Bacteria
- Mumps
- Parvovirus
- Pertussis
- Poliomyelitis
- Rabies
- Rubella
- Scabies and Pediculosis
- *Staphylococcus aureus* (MSSA/MRSA)
- *Streptococcus* (group A)
- Tuberculosis

- Vaccinia
- Varicella
- Viral Respiratory Infections (Influenza, Respiratory Syncytial Virus (RSV), others)
- Potential Agents of Bioterrorism (e.g., Anthrax)

The Workgroup has prioritized the pathogens that were included in the 1998 Guideline for updating. The first pathogens selected for update are:

- Measles
- Mumps
- Pertussis
- Rubella
- *Staphylococcus aureus* (MSSA/MRSA)
- Viral Respiratory Infections (Influenza, RSV, others).

The grouping of pathogens for update is based on whether new information is available and an update is needed, as well as on logical groupings, such as clustering measles, mumps, and rubella because of the Measles, Mumps, Rubella (MMR) vaccine.

Five Key Questions were formulated to guide the literature search for the *S. aureus* section update. The questions were divided into two groups based on the setting in which the study or literature was developed:

In healthcare settings **without** a concurrent MSSA/MRSA outbreak or recognized transmission among patients, patients and healthcare personnel, or healthcare personnel to healthcare personnel:

- Q1: For healthcare personnel with laboratory-confirmed MSSA/MRSA infection, which interventions reduce MSSA/MRSA infections or colonization among patients and/or other healthcare personnel?
- Q2: For asymptomatic healthcare personnel, does screening for MSSA/MRSA colonization lead to implementing interventions that prevent MSSA/MRSA infections or colonization among patients and/or other healthcare personnel?

In healthcare settings **with** a concurrent MSSA/MRSA outbreak or transmission between patients, patients and healthcare personnel, or healthcare personnel to healthcare personnel:

- Q3: For healthcare personnel with laboratory-confirmed MSSA/MRSA infection, which interventions reduce MSSA/MRSA infections or colonization among patients and/or other healthcare personnel?
- Q4: For MSSA/MRSA colonized healthcare personnel, which interventions reduce MSSA/MRSA infections or colonization among patients and/or other healthcare personnel?
- Q5: For asymptomatic healthcare personnel, which anatomic sites of MSSA/MRSA colonization have the highest risk of transmission to patients and/or other healthcare personnel?

When these questions were presented to HICPAC, there was discussion regarding the likelihood of a known outbreak serving as a “trigger” for examining transmission risk factors and specific interventions. Most of the literature is contextualized either in an outbreak setting or an

endemic setting; the convention of categorizing the Key Questions by setting is to help sort the literature. The Workgroup will likely consider the settings equally.

For the *S. aureus* systematic literature review, 3971 articles were identified. Of those:

- 3464 were excluded at title and abstract screen.
- 321 were excluded at full text review.

Pending 73 further reviews, 112 articles are selected for data extraction. Most of the identified literature addresses Key Question 4. The data extraction process is ongoing.

The Workgroup is also working on the Pertussis section of the Guideline update. The group has reviewed and assessed the 1998 Pertussis recommendations for gaps and outdated recommendations. The group has reviewed the most recent ACIP recommendations for healthcare workers, which were published in 2011, and has reached out to CDC pertussis SMEs for their input.

Dr. Babcock presented the 1998 Pertussis recommendations and a “very preliminary” draft of the suggested updated recommendations for HICPAC to preview and discuss.

1998 Recommendations

- a. Do not administer whole-cell pertussis vaccine to personnel. **Category IB**
- b. NO RECOMMENDATION for routine administration of an acellular pertussis vaccine to health care personnel. **UNRESOLVED ISSUE**

The Workgroup proposes to delete the 1998 Recommendations (a) and (b) and to refer to *ACIP 2011 Recommendations for Immunization of Healthcare Personnel*, which state that “healthcare personnel, regardless of age, should receive a single dose of Tdap as soon as feasible if they have not previously received Tdap.” The narrative also will refer to Section 1 of the *Healthcare Personnel Guideline Update*, which states, “Ensure that healthcare personnel either receive immunizations or have documented evidence of immunity against vaccine-preventable diseases as recommended by the CDC, CDC’s Advisory Committee on Immunization Practices (ACIP) and required by federal, state or local authorities.” The deletions are suggested in order to avoid creating duplicative recommendations.

The Workgroup is reformulating the 1998 Pertussis post-exposure prophylaxis (PEP) recommendation to combine considerations pertaining to PEP and post-exposure work restrictions. The updated recommendations will be tiered based on several considerations. The 1998 and draft update recommendations are:

1998 Recommendation

- c. Immediately offer antimicrobial prophylaxis against pertussis to personnel who have had unprotected (i.e., without the use of proper precautions), intensive (i.e., close, face-to-face) contact with a patient who has a clinical syndrome highly suggestive of pertussis and whose cultures are pending; discontinue prophylaxis if results of cultures or other tests are negative for pertussis and the clinical course is suggestive of an alternate diagnosis. **Category II**

DRAFT Update (italicized emphasis added)

- a.1 Offer post-exposure prophylaxis against pertussis to healthcare personnel, regardless of pertussis vaccine status, who have had unprotected exposure to pertussis and who either have preexisting health conditions that may be exacerbated by a pertussis infection, or are likely to interact with persons at high risk for severe pertussis.
- a.2 For *asymptomatic* healthcare personnel who have had unprotected exposure to pertussis and who are likely to interact with persons at high risk for severe pertussis:
 - If receiving post-exposure prophylaxis, work restrictions are not necessary.
 - If not receiving post-exposure prophylaxis, restrict from contact (e.g., furlough, duty restriction/reassignment) with patients and other persons at high risk for severe pertussis for 21 days after last exposure.
- b.1 For *asymptomatic* healthcare personnel who have had unprotected exposure to pertussis and who are *not likely* to interact with persons at high risk for severe pertussis, offer post-exposure prophylaxis or implement daily monitoring for 21 days after the last exposure for development of signs and symptoms of pertussis. Work restrictions are not necessary.

Dr. Babcock noted that in general, “persons at high risk for severe pertussis” are understood to include infants, pregnant women, and immunocompromised patients. Workers considered to be likely to interact with persons at high risk for severe pertussis would include NICU personnel, OB/GYNs, labor and delivery personnel, bone marrow transplant unit personnel, etc. Regarding the recommendation for work restrictions, the Workgroup has grappled with the language “work restrictions are not necessary” versus “do not implement work restrictions.” In general, use of the phrasing “do not implement” in recommendations has been reserved for situations in which a practice is believed to cause harm. Therefore, the Workgroup tends to prefer the phrase “work restrictions are not necessary.”

The 1998 Recommendation and suggested update regarding symptomatic personnel are:

1998 Recommendation

- a.3 Exclude personnel in whom symptoms develop (e.g., cough \geq 7 days, particularly if accompanied by paroxysms of coughing, inspiratory whoop, or post-tussive vomiting) after known exposure to pertussis from patient care areas until 5 days after the start of appropriate therapy. **Category IB**

DRAFT Update

- c. Exclude symptomatic healthcare personnel with known or suspected pertussis from work from symptom onset through the third week of onset of paroxysms, or until 5 days after the start of effective antimicrobial therapy.

The Workgroup’s next steps are to continue the *S. aureus* data extraction and evaluation, and to finalize the draft updated Pertussis recommendations and text. They will then focus on measles, mumps, and rubella. Work will also begin on the next pathogen group, which includes: Diphtheria, Meningococcal Disease, Parvovirus, Poliomyelitis, *Streptococcus* (group A), and

Varicella.

In closing, Dr. Babcock invited feedback about the general direction of the updated recommendations.

Discussion Points

HICPAC asked how many papers in the initial literature review were specific to MSSA and whether the group anticipates that the bulk of the evidence, particularly in outbreak settings, will pertain to MRSA. HICPAC further asked if the Workgroup will address *S. aureus* and extend what they learn about MRSA to MSSA, or whether they will specifically focus on MRSA.

Dr. Babcock's impression thus far is that more articles found in the literature review focus on MRSA than on MSSA. The Workgroup has not yet determined whether the recommendation will focus on *S. aureus* and extend what is learned about MRSA to MSSA, or whether it will specifically focus on MRSA. They will make this decision when the literature review is complete and they can assess the data.

Regarding pertussis, HICPAC asked whether the update will better define "unprotected exposure."

Dr. Babcock answered that the update will likely address unprotected exposure to pertussis, probably in the narrative text rather than in a recommendation, but they may not be able to provide a more specific definition than the 1998 Guideline provided. Guidance about exposure would be helpful; it is a common question.

HICPAC asked if the Workgroup plans to make a statement about parapertussis, an issue that arises in practice, especially with PCR testing.

Dr. Babcock agreed that parapertussis should be mentioned in the document. Respiratory viral pathogen panels are detecting parapertussis more frequently.

Dr. Bell applauded the clarity of the pertussis draft language and asked whether the Workgroup foresees the MMR sections being somewhat parallel in structure, given that they are similarly exclusion-driven. He commended the Workgroup's consistency in deferring to ACIP regarding immunization practices and in maintaining the infection control/non-immunization recommendations. ACIP does not make infection control recommendations; that clarity and separation is helpful.

Dr. Babcock said that the structure of the draft pertussis recommendations is helpful. The 1998 Guideline text describes what might constitute an exposure and how to handle exposed personnel based on their vaccination status and other factors, such as whether prophylaxis is available. There may be some variation to the "tiered approach" among the pathogen sections depending upon issues such as transmission risk prior to symptom onset.

There was discussion regarding moving away from universal Azithromycin prophylaxis for pertussis. Sometimes it is complicated in the hospital setting to determine who is at risk for severe pertussis and how those patients are distributed in a facility.

Following CDC and ACIP guidance regarding pertussis outbreaks in communities and defining who is at highest risk of acquiring pertussis from the index patient, Dr. Babcock indicated that the Workgroup aims to allow for flexibility regarding defining exposure and risk for individual

healthcare personnel and the patients with whom they come into contact. In practice, many facilities seem to be approaching exposure and risk in this manner.

HICPAC described a frequent question in occupational health: how to handle new employees who cannot receive one or more vaccinations due to allergies, previous reactions, or other exclusions. Will this document address this situation?

Dr. Babcock replied that the Workgroup has not discussed that issue, but they can consider whether and how the document might address secondary lines of protection or assignments based on the ability to receive specific vaccinations. It would be helpful to have more effective and durable pertussis and influenza vaccines, but the postexposure recommendations for pertussis do not vary based on a healthcare worker's vaccination status.

HICPAC asked how to parse out persons at high risk for severe pertussis within a children's hospital. Personnel in the emergency department would seem to be most likely to be exposed, and they have a great deal of contact with young infants who present to the department for any reason, or who are admitted to the medical/surgical ward.

Dr. Babcock agreed and emphasized that the question represents a challenge. The Workgroup has discussed at length whether a lower-risk area can be defined within a pediatric hospital. Certainly, the NICU and bone marrow transplant areas are at higher risk. However, there are very young infants on most wards, in the emergency department, and in other areas. The Workgroup has not reached a conclusion regarding how to handle this issue, given that healthcare personnel who do not receive PEP and who work in high-risk areas are restricted from care delivery for 21 days after exposure to pertussis. From a staffing and patient safety perspective, furloughing large swaths of healthcare personnel also presents concerns. The Workgroup welcomes additional input from pediatric colleagues about the best way to address this issue.

HICPAC suggested that the question might be better left to the individual institution, given that high-risk areas in pediatric hospitals are difficult to define. Perhaps implementation discussion could be provided.

The American College of Occupational and Environmental Medicine (ACOEM) explained that the goal of PEP and work restrictions is to prevent transmission to the patient population. Their stance is to allow facility Infection Control and Occupational Health groups to make decisions, which are likely to vary from institution to institution.

HICPAC noted that the draft recommendations offer the option to provide prophylaxis to asymptomatic healthcare personnel who are not likely to interact with persons at high risk.

Dr. Babcock clarified that Draft Recommendation a.1 is for healthcare personnel who are likely to interact with people at high risk for severe pertussis, and Draft Recommendation b.1 is for healthcare personnel who are not likely to interact with people at high risk. She agreed that the recommendations should be structured carefully to ensure that they are clear.

National Healthcare Safety Network (NHSN) Workgroup Update

Michael Howell, MD, MPH
NHSN Workgroup Co-Chair
Principal Scientist

Google, Inc.

Deborah Yokoe, MD, MPH
NHSN Workgroup Co-Chair
HICPAC Co-Chair
Brigham & Women's Hospital
Associate Professor, Harvard Medical School

Dr. Howell explained that the HICPAC NHSN Workgroup is a follow-on to prior committees that provided advice to NHSN, especially regarding how NHSN data are understood and used to help patients. This Workgroup's goal is to inform NHSN planning and development on subjects such as analytics, data elements, definitions, and processes. The Workgroup is comprised of a body of experts from HICPAC and other organizations, and its charge is to provide input on NHSN topics, including:

- Data access policies and practices
- Data validation
- Quality measurement priorities and methods
- Data use for healthcare-associated infection (HAI) prevention at the facility, local, state, and national levels
- Informatics/information technology advances and surveillance improvements, including data security and information technology (IT) platforms

This charge was presented to HICPAC at the July 2017 meeting. The subsequent discussion at the meeting reflected robust engagement and enthusiasm for the Workgroup. A number of high-priority topics were identified during the discussion, including:

- Data validity, "gaming," and inter-institutional variation
- Risk adjustment and statistical issues
- Optimization of definitions
- Usability of reports
- Communication and multiplying effect

In order for the Workgroup to fulfill its charge efficiently and effectively, the topics were consolidated into focus areas for two Subgroups:

- Subgroup A, Definitions and Data
- Subgroup B, Reporting and Communications

Subgroup A will be co-led by Drs. Deborah Yokoe and Anthony Harris, with technical advice provided by representatives from the DHQP Surveillance Branch. This group will evaluate possible surveillance definition revisions that can improve and streamline surveillance efforts and ensure that surveillance leads to outcomes that are meaningful across the spectrum of healthcare facilities. Regarding data validation, Subgroup A will identify processes to support validation of HAI data submitted into NHSN, as well as assess and minimize the potential for "gaming" of outcome data. They will also explore ways to enrich current risk adjustment methods (e.g., patient-level data) to improve inter-hospital comparisons and to improve methods for assessing outcomes for smaller facilities.

Subgroup B, Reporting and Communications, will be co-led by Drs. Michael Howell and Vineet

Chopra, with technical advice provided by representatives from the DHQP Surveillance Branch. This Subgroup's topic areas are new, and it is important to think about them in structured, disciplined ways. They will consider how to improve the interpretability of reports and metrics for infection preventionists, other hospital-based quality leaders, public health, and consumers, and to facilitate use of NHSN data to improve patient outcomes. Regarding communication and enhancing the "force multiplier" effect, Subgroup B will explore strategies to facilitate translating surveillance data into actionable steps and to improve integration of NHSN data into the HAI prevention work of consumer advocacy groups.

Discussion Points

HICPAC commented on the ambitious nature of the NHSN Workgroup's charge, what is in the group's scope and what is not, and the group's anticipated timeline.

CDC has a data validation method, and some state health departments have developed other validation approaches. For example, the California Department of Public Health (CDPH) publishes data every year, utilizing validation to improve case-finding and to ensure that users understand the definitions. Pilot work revealed that a lack of understanding of definitions was the most significant problem. CDPH also struggles with a "level playing field" for 400 hospitals in the state.

The Council of State and Territorial Epidemiologists (CSTE) wondered to what degree these two Subgroups will interact with other work that is underway. Several health departments have received funding to perform data validation, and it is important to incorporate their experience. The Data Analysis and Presentation Standardization (DAPS) Toolkit was developed by CDC and CSTE and has been well-received. This toolkit will soon be revised, and it would be beneficial to integrate ongoing work led by CSTE and CDC around data validation into the HICPAC NHSN workgroup discussions.

Dr. Cardo agreed that the beginning focus of the groups is important. She emphasized the importance of thinking about how the data will be used for prevention regionally and nationally, and in the future. She asked the group to consider these ideas not only in terms of "fixing issues," but also in terms of continuing to prevent infections and make a difference in patient safety.

Dr. Yokoe noted that the intent of their work could be incorporated into an overall Workgroup mission statement.

HRSA is excited about the NHSN Workgroup and its work regarding data validation and the usability of reports. HRSA creates reports for critical access hospitals, and there are numerous challenges associated with small numbers. HRSA offered to share its best practices with the NHSN workgroup regarding how they have been able to approach report usability, as well as how they have pursued data validation to ensure that hospitals report correctly.

TJC is pleased about the direction of the NHSN Workgroup and agrees that it is important to address some of the methodological problems that have arisen. From the accreditation standpoint, this work is important because TJC is continually looking at better data to inform quality improvement in its healthcare organizations. TJC can be of assistance in this area when the Workgroup completes its work and asked about the timeframe and anticipated endpoint for the Subgroups.

Dr. Howell replied that the timeframe has not been established. The Subgroup leads are

working to set up initial meetings.

Dr. Yokoe added that it will be important for the Workgroup to determine short- and long-term goals.

Regarding the group's scope and timeline, HICPAC suggested that the Subgroups identify concrete deliverables. The Workgroup might also think about how best to advise NHSN as an organization, balancing the desire for consistency with the need for nimble course corrections.

The Surgical Infection Society (SIS) stressed the importance of understanding how NHSN data is used and suggested that the Workgroup could develop models to provide accurate data throughout the spectrum of "good to bad," or data could be used to discern poor performers and help them improve. Some facilities accept being "average," while others will work to be "at the top."

HICPAC noted that rather than calculating infection types in terms of which individual facilities have the highest CLABSI rates, for example, perhaps they could look at rates "horizontally" across facilities so that outcomes are not "siloes" by infection type. The NHSN Workgroup can help think about how to look at hospitals' composite HAI performance rather than focusing on specific infection categories.

Dr. Cardo stressed that NHSN is only one of many sources of data for CDC and the federal government. Good data are needed to prevent infections on a national scale. States are funded to examine data in order to help institutions that are not doing well, and to learn from institutions that are doing well. It would be helpful for CDC to receive guidance regarding current focus areas such as *C. difficile* and improving data, as well as guidance regarding future focus areas, such as composite measures.

CSTE pointed out the importance of focusing on risk factors that are potentially modifiable when thinking about risk adjustment.

In terms of driving mid-level hospitals' rates down, HICPAC recalled that there were large reductions in CLABSI as part of HHS's 2020 reduction goals, but many hospitals did not continue to pursue further reductions because they were comfortable with their results. Consideration should be given to how much CDC and NHSN are going to emphasize the HHS 2020 reduction goals so that they are changing the expectation from "we are good enough."

The reduction initiatives drove improvement goals, but it is important to remember that facilities rely on the CDC's defined outcome measure because they do not have the expertise, resources, etc., to define that outcome. CDC "provides the measuring stick" to the users to drive improvement efforts to reduce infection; this work is critically important.

HICPAC commented that many elements within a healthcare system impact HAI outcomes. As the Workgroup begins to consider measures, they could glean wisdom from the Study on the Efficacy of Nosocomial Infection Control Project (SENIC) regarding how a program is designed and details such as the program's authority and staffing. Data validation problems or gaming are less likely if the right system is in place. Gaming may occur in settings where programs are poorly supported. Dynamic infection prevention measures may be helpful.

AEH emphasized the importance of working in the context of the current environment of recommendations, ongoing research, etc., to look at patient- and community-level factors that

have an effect on outcome measures or complications. Regarding usability, AEH expressed hope that the NHSN Workgroup would look to the unintended consequences that have come with the large number of ratings that are available for consumers. It is important to assess NHSN in light of the desire of some in the field to “revamp” and consolidate quality reporting programs. The Commissioners on the Medicare Payment Advisory Commission (MedPAC) were concerned about keeping infection control in the forefront of providers’ minds and not losing the infection control aspects of the program if it is consolidated in, or removed entirely from, pay-for-performance reporting. AEH looks to CDC to help providers continue their efforts. The work of NHSN is even more important moving forward.

Dr. Cardo counts on HICPAC to help CDC move the field forward, particularly in accepting definitions that are based on data that can be collected electronically. HICPAC can help CDC move forward so that the means of acquiring and researching data are more standardized.

HICPAC can provide guidance on strategy and the drivers for measurement. Much of the broad adoption and submission of data has been due to mandates, and health systems have to make decisions about how to allocate funds. Even with electronic measures and automated data, submission time, money, and human resources are costs for implementation, even when the same health record system is used across several health systems. Groups that submit voluntary measurement to other systems tend to have budgetary flexibility and sufficient funding. There is risk associated with changing elements that have motivated and driven health systems, and there could be some consequences regarding what is measured, how it is measured, etc.

CU stressed that the public expects this information to be as valid as possible. Other entities are involved; the work does not fall exclusively to CDC, but consumers need to be able to count on the data. CU encouraged CDC and the NHSN Workgroup to look at other data that are available to allow for checks, and to enlist the help of individuals who can discern when gaming is taking place. Gaming will not stop until the actors are “called out.” The public does not understand how difficult it is to count infections in hospitals, but these events happen way too often across the country, and it is not unreasonable for the public to expect that valid information be reported. Perhaps an anonymous reporting system could be created so that people can report institutions that hide data. Gaming must be stopped, and the people responsible must be held accountable to the public for the harm that gaming causes.

HICPAC Workgroup Update: Recommendation Categorization Scheme Update

Dan Diekema, MD, MS

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Dr. Diekema described the Recommendation Categorization Update Workgroup’s progress toward updating HICPAC’s recommendation categorization scheme. He presented a draft of the proposed scheme and language. HICPAC’s current recommendation categorization scheme is:

- **IA:** A strong recommendation supported by high- to moderate-quality evidence suggesting net clinical benefits or harms
- **IB:** A strong recommendation supported by low-quality evidence suggesting net clinical benefits or harms; or an accepted practice supported by low- to very low-quality evidence
- **IC:** A strong recommendation required by state or federal regulation
- **II:** A weak recommendation supported by any quality evidence suggesting a trade-off between clinical benefits and harms
- **No recommendation/unresolved issue:** An issue for which there is low- to very low-quality evidence with uncertain trade-offs between the benefits and harms or no published evidence on outcomes deemed critical to weighing the risks and benefits of a given intervention.

HICPAC was prompted to revisit this scheme because of concerns that it is not readily translatable into recommendations for many infection prevention-related topics. Further, the rationale for choosing categories is not always completely transparent. The current categorization scheme's approach to data gaps is not ideal, often leading to a "no recommendation." Ideally, the recommendation categorization scheme will be able to address bundled interventions, and coordination with other partners, stakeholders, professional societies, etc., will be explicit.

- How can HICPAC simplify its categories?
- How can HICPAC improve transparency around the rationale for choosing specific recommendation categories?
- How should HICPAC address practices for which evidence is scant or absent?
- How should HICPAC address bundled practices?
- How should HICPAC partner with professional societies and other guideline promulgating organizations?

Dr. Diekema presented and reviewed draft recommendation categories and supporting language for discussion and input:

Table 1: Overall Strength of Recommendations

Overall Strength of Recommendations			
Strength	Definition	Implied Obligation	Language
Recommendation	A Recommendation means that we are confident that the benefits of the recommended approach clearly exceed the harms (or, in the case of a strong negative recommendation, that the harms clearly exceed the benefits). In general, Recommendations should be supported by high- to moderate-quality evidence. In some circumstances, however, Recommendations may be made based on lesser evidence or even expert opinion when high-quality evidence is impossible to obtain and the anticipated benefits strongly outweigh the harms.	A Recommendation implies that healthcare personnel/healthcare facilities “should” implement the recommended approach unless a clear and compelling rationale for an alternative approach is present.	<ul style="list-style-type: none"> The wording of the Recommendation should specify the setting and population to which the Recommendation applies. Declarative verbs, e.g., use, perform, maintain, replace Should, should not Recommend/ is recommended, recommend against/ is not recommended Is indicated/ is not indicated
Conditional Recommendation	<p>A Conditional Recommendation means that we have determined that the benefits of the recommended approach are likely to exceed the harms (or, in the case of a negative recommendation, that the harms are likely to exceed the benefits) in:</p> <ul style="list-style-type: none"> select settings (e.g., during outbreaks) select environments (e.g., intensive care units) select populations (e.g., neonates, transplant patients) or as supplemental measures; that is, in addition to basic practices. <p>Conditional Recommendations may be supported by either low-, moderate- or high-quality evidence when:</p> <ul style="list-style-type: none"> there is high-quality evidence, but the benefit/harm balance is not clearly tipped in one direction the evidence is weak enough to cast doubt on whether the recommendation will consistently lead to benefit there appears to be benefit based on available evidence, but the benefit/harm balance may change with further research benefit is most likely if the intervention is used as a supplemental measure in addition to basic practices 	A Conditional Recommendation implies that healthcare facilities/ personnel “could,” or “should consider” implementing the recommended approach. The degree of appropriateness may vary depending on the benefit vs. harm balance for the specific setting.	<ul style="list-style-type: none"> The wording of the Conditional Recommendation should specify the setting and population to which the Conditional Recommendation applies. Consider Could Should Consider May/ may consider
No Recommendation	No Recommendation is made when there is both a lack of pertinent evidence and an unclear balance between benefits and harms.		“No recommendation can be made regarding”

Table 2: Justification for Choice of Recommendation

Transparency: Justification for Choice of Recommendation Strength to be Included in Text		
Components	What to include	Comments
Aggregate evidence quality	See below	
Benefit	List the favorable changes in outcomes which would likely occur if the recommendation were followed	Be explicit, clear about pros/cons
Risks, harms, costs (e.g., direct costs, opportunity costs)	List the adverse events or other unfavorable outcomes that may occur if the recommendation were followed	Be explicit, clear about pros/cons
Benefit-harm assessment	Classify as “preponderance of benefit over harm” (or vice versa) or a “balance of benefit and harm”	Recommendations are possible when clear benefit is not offset by important harms or costs (or vice versa); conversely, when the benefit is small or offset by important adverse events, the balance between benefit and harm prevents a Recommendation.
Value judgments	Summarize value judgments used by the group in creating the recommendation; if none were involved, state “none”	Translating evidence into action often involves value judgments, which include guiding principles, ethical considerations, or other beliefs and priorities; stating them clearly helps users understand their influence on interpreting objective evidence.
Intentional vagueness	State reasons for any intentional vagueness in the recommendation; if none was intended, state “none”	Recommendations should be clear and specific, but if the group chooses to be vague, acknowledging their reasoning clearly promotes transparency. <i>AAO-HNS reasons for vagueness: insufficient evidence; inability to achieve consensus among panel regarding evidence quality, anticipated benefits/harms, or interpretation of evidence; legal considerations; economic reasons; ethical/religious issues</i>
Exceptions	List situations or circumstances where the recommendation should not be applied	
Differences of opinion	Describe and explain any differences of opinion regarding the recommendation	Rate as “none,” “minor,” or “major” and explain if anything other than “none.” Indicate whether the group achieved consensus or not (per CF guidelines).

Table 3: Aggregate Quality of Evidence

Aggregate Quality of Evidence for Each Recommendation	
High	Highly confident that the true effect lies close to that of the estimated size and direction of the effect. For example, evidence is rated as “High” quality when there are a wide range of studies with no major limitations, there is little variation between studies, and the summary estimate has a narrow confidence interval.
Moderate	The true effect is likely to be close to the estimated size and direction of the effect, but there is a possibility that it is substantially different. For example, evidence is rated as “Moderate” quality when there are only a few studies and some have limitations but not major flaws, there is some variation between studies, or the confidence interval of the summary estimate is wide.
Low	The true effect may be substantially different from the estimated size and direction of the effect. For example, evidence is rated as “Low” quality when supporting studies have major flaws, there is important variation between studies, the confidence interval of the summary estimate is very wide, or there are no rigorous studies.

Based on Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) and the Canadian Task Force on Preventive Health Care

Discussion Points

Table 1: Overall Strength of Recommendations

NIH commended HICPAC for incorporating common sense into the draft categorization scheme. The proposed scheme recognizes that there will never be randomized controlled trial (RCT)-level evidence to support some recommendations. The components of the recommendations are presented in “good, solid English.”

HICPAC suggested that the categorization scheme explicitly acknowledges that benefits and harms are frequently found at the individual and group levels. Antimicrobial use, stewardship, and resistance, for instance, may present group-level harm in addition to individual-level benefit.

Dr. Bell asked how the “select settings, environments, and populations” examples in the Definition component of the Conditional Recommendation category relate to the settings and populations language in the Language component of the Recommendation category.

Dr. Yokoe clarified that Recommendations and Conditional Recommendations should clearly specify the population(s) or setting(s) to which they apply. The Definition component can be revised to indicate that in some cases, there will be strong evidence of benefit in a specific population, but less evidence of benefit in other populations. In such a case, a Conditional Recommendation would apply to the other populations.

The Workgroup grappled with this issue in its deliberations. As much as possible, strong, specific Recommendations are preferable. The Workgroup also recognized that some situations, such as outbreaks, present different challenges. The “select settings, environments, and populations” language is provided for the Recommendation category and for the Conditional Recommendation category, with examples of situations in which a Conditional Recommendation might be appropriate, versus as an all-inclusive list of times when a Conditional Recommendation must be used.

The Conditional Recommendation category “Definition” column should retain the mention of supplemental measures in addition to basic practices.

CSTE echoed support for strong Recommendations for patients with particular conditions, given concern that practitioners may not consider a Conditional Recommendation for particular subpopulations to be a strong recommendation. If there is strong evidence for subpopulations, the Recommendation category is appropriate. If the Recommendation is extrapolated to populations and it is believed that there may be some benefit for them, then a Conditional Recommendation is appropriate.

Table 2: Justification for Choice of Recommendation

HICPAC expressed concern that the Justification for Choice of Recommendation places “harms” and “costs” on the same line, suggesting that they should be considered at the same time. “Harms” and “costs” could be separated. Often, data will be available on harms, but not on costs. It is not always clear how to balance harms and costs, especially if good data on costs are not available. These questions could affect the strength of a recommendation. Further, costs can change over time, but harm is less likely to change.

ACOEM suggested avoiding language and structures that could predispose HICPAC to creating “No Recommendations” more frequently. When there is high-quality evidence and a balance of benefits and harms, is it more definitive to say “No Recommendation” versus “Conditional Recommendation?”

Dr. Yokoe interpreted the Workgroup’s intent to be that a Conditional Recommendation should apply when data suggest that there may be benefits associated with it, but the benefits are not completely clear because the evidence is of lower quality.

HRSA asked how the proposed new scheme incorporates the previous scheme’s Category IC, which addresses regulatory requirements.

Dr. Diekema replied that federal requirements would be categorized as a Recommendation, and the accompanying rationale would explain the requirement. The new scheme does not have a separate category for federal requirements. Dr. Yokoe added that state regulations are not incorporated into HICPAC recommendations.

HICPAC suggested adding “Federal requirements” to the Justification for Choice of Recommendation table.

Table 3: Aggregate Quality of Evidence

Regarding the “Moderate” category, HICPAC suggested addressing wide confidence intervals by using meta-analyses or other techniques to combine study results to yield narrower confidence intervals. HICPAC has taken this approach in the past and perhaps should do so more regularly.

Dr. Yokoe noted that the table refers to the aggregate quality of evidence to support a recommendation; it does not address individual studies or their confidence intervals.

General Comments

Dr. Bell commented that the draft Recommendation Categorization scheme is clear, straightforward, intuitive, and more transparent than the current HICPAC scheme. The proposed new scheme will capture more interpretive content; he wondered how that content might affect the production of recommendations. Including regulatory requirements in the Recommendation category is appropriate, as regulatory requirements are a “Must Do.” The next step may be to test the draft scheme by mapping it to an existing evidence base. It will be helpful to apply the scheme to different types of recommendations, such as practices, interventions, infrastructure, etc., to learn how it will work in practice and whether it may need to be adjusted to be most useful to the field.

The Public Health Agency of Canada (PHAC) described Canada’s experience in recommendation categorization, including the work of the Canadian Task Force on Preventive Health Care (CTFPHC). They develop screening tools and have access to a number of RCTs, but gaps remain. PHAC’s toolkit does not rely on GRADE, recognizing the lack of high-quality evidence. There are concerns that the approach does not use GRADE, but the toolkit allows for the capture of descriptive studies, outbreak reports, modeling, etc., as well as expert opinion. PHAC’s approach considers the quality of the evidence and the strength of the recommendation almost simultaneously: the processes are separate, but connected. One of PHAC’s current projects is a guideline for healthcare workers infected with bloodborne pathogens. The project utilizes a systematic review. Recent work by WHO has separated GRADE recommendations from “good practice statements.” This approach is interesting and worth consideration.

CSTE asked how the final recommendation will be presented in the new scheme. The transparent details should be easily available to readers.

Dr. Bell agreed and added that the format of recommendations under a new scheme has not been determined. Recommendations should not only describe “what to do” – the strength of the recommendation – but also, “why do it” – the strength of the evidence. There is an opportunity to present information so that both elements are clear and the transparent rationale is linked to the recommendation.

HICPAC commented that professional societies that generate recommendations are transparent about the factors that affected the creation of a recommendation. For instance, the text might state, “In formulating this recommendation, we placed a high value on neurologically intact survival as compared to X” or “We placed a high value on societal cost as opposed to X.”

Products and Practices Workgroup Update

Lynn Janssen, MS, CIC, CPHQ
Chair, HICPAC Products and Practices Workgroup
Chief, Healthcare-Associated Infections Program
Center for Health Care Quality
California Department of Public Health

Ms. Janssen presented an update on the HICPAC Products and Practices Workgroup.

The charge of the Products and Practices Workgroup is to:

- Develop a process for HICPAC to use when developing recommendations for products
- Describe how criteria for developing product-specific recommendations may be different from criteria for developing practice-specific recommendations

- Provide a rationale for the criteria.

The Workgroup is also addressing:

- How the process should be applied (all products versus selected product types)
- Which products should be grouped as a class (versus independently evaluated), and when that grouping should occur
- How the process will address novel commercial products
- Where recommendations should be generic to allow for future product development

The Workgroup will create an algorithm to guide HICPAC in making product-related recommendations. The Workgroup conducts this work with the following tenets in mind:

- Products that may contribute to HAI prevention should be evaluated as fairly and fully as clinical practices are evaluated
- The process that HICPAC uses to make recommendations about products should be transparent
- Research should be evaluated consistently and assessed for possible bias
- Innovation in product development can result in better solutions to meet infection control needs
- Products may be the most effective intervention available

HICPAC's *ex officio* member from FDA, Elizabeth Claverie-Williams, provided helpful background information on FDA's different approval processes. Given this information and the above tenets, the Workgroup has developed draft decision nodes for an algorithm.

- A. Is the product/device FDA approved, cleared, or granted, or Environmental Health Protection Agency (EPA) registered?
 - HICPAC will not evaluate products that are not approved/cleared/granted or registered
- B. What are the clinically relevant human outcomes for the product/device?
 - e.g., reductions in colonization, surgical site infections, adverse events, etc.
- C. What are the indications for use or label claims for the product/device?
 - "...should include specific indications, clinical settings, define the target population, anatomical sites, etc. This statement must be consistent with your labeling, advertising and instructions for use"⁶
- D. Is the product/device marketed for infection prevention?
 - May be different from indications for use and/or label claims
- E. What type of FDA approval does the product/device have?
 - Premarket approval (PMA) "approval"
 - 510(k) (i.e., predicate product) "clearance"
 - De novo "granted"
- F. Is there pre-market evidence for the product/device?
 - If so, what is the type and quality of the evidence?

⁶ <https://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/HowtoMarketYourDevice/PremarketSubmissions/PremarketNotification510k/ucm142651.htm>

- Evaluate study design, relevance of outcomes, definitions used, funding streams, conflicts of interest, etc.
- Does the evidence include:
 - Non-human outcomes (e.g., reduced colony counts)?
 - Clinically relevant human outcomes?
- Does the evidence support the marketing?
- G. Is there post-market evidence for the product/device?
 - If so, what is the type and quality of the evidence?
 - Evaluate study design, relevance of outcomes, definitions used, funding streams, conflicts of interest, etc.
 - Does the evidence support the marketing?
- H. What evidence for safety or assessment of potential harms is available?
 - This data could be made available by FDA
- I. Is there evidence of efficacy for the specified clinically relevant human/health outcome?
 - Should proxy outcomes be considered for human/health outcomes?
- J. Does the product/device show superiority over established alternatives?
 - What is the context of the study performance?
- K. Does the product/device show impact when used alone or as part of a bundle?
 - Was the product/device added to standard of care when evaluated?
- L. Are the findings generalizable to a class of products vs. single products?
 - Consider similarities or differences in active ingredients, mechanism of action, product design, and instructions for use
- M. Is the available evidence generalizable?
 - Consider study design, study population, definitions, etc.
- N. Are there cost implications?
 - Cost will be a tertiary consideration only, for example:
 - Time cost
 - Implementation cost
 - Financial cost
- O. Does the complete assessment inform or support a recommendation?
 - Summary statement of the balance of the nodes

The Workgroup's next step will be to put the decision nodes into an algorithm format, and then to test the draft algorithm with example devices that improve infection control, such as disinfection, sterilization, or cleaning products. The algorithm will be adjusted based on the testing and then presented to HICPAC. A white paper will be developed describing the algorithm and process of creating it. Ms. Janssen posed questions for HICPAC consideration and discussion:

- Does the algorithm need additional decision nodes?
- Should a similar algorithm be developed for evaluating practices?

Discussion Points

HICPAC observed that some of the decision points address evaluating strength of evidence, and some points relate to the strength of the recommendation.

The Workgroup's goal is to craft a standardized decision flow of the product evaluation process. The algorithm will not GRADE the evidence; rather, it presents branch points at which a group will determine whether there is evidence to support a decision.

Dr. Cardo asked how this evaluation might be triggered.

Dr. Bell said the elements in the algorithm are important to consider when evaluating a device; there is no indication, however, of when, or whether, a product ought to go through this proposed process. Given that a large number of products could potentially be brought to HICPAC, he wondered about defining a small subcategory of products that warrant this kind of assessment, or creating a way to target the process.

The Workgroup clarified that the algorithm is designed to support HICPAC Workgroups that develop guidelines and recommendations when questions about products arise during the development process. The trigger to apply the algorithm comes from within the development process when the group needs to consider a product. Because the evaluation is not intended to take place as a result of a request for HICPAC to review a product, no trigger or request mechanism is specified. Any device evaluated by HICPAC as part of a guideline or recommendation development process would have to claim clinical usefulness.

Dr. Bell commented on presentations that are made each year by their industry colleagues on new and innovative ideas. Some of those products, especially products related to the environment, are coming on the market. Manufacturers do not need a CDC recommendation to implement a product in a healthcare system; they need evidence that the product works and a strong “pitch” and economic bottom line. In thinking about potential future work for CDC and HICPAC regarding environmental hygiene, he noted several factors that might be considered: implementation costs and process improvements that come with a product, in particular in environmental services; how the product is moved from room to room; how it is maintained, etc. The consideration of practices is not always as rigorous. For instance, there have been no discussions of the ergonomics of hand hygiene.

HICPAC suggested incorporating the concept of human factors engineering and how it can be better applied.

HICPAC observed that important, impactful points regarding standard of care appear to be “buried” in Item K of the draft decision nodes. It is important for HICPAC to reinforce messages about the basic and core practices that are expected to be part of study design. If these practices are not applied, then HICPAC recommendations could be affected.

HICPAC asked whether this evaluation process will consider the off-label use of pharmaceuticals or devices. For example, the group previously discussed Azithromycin for pertussis prophylaxis, which is an off-label use. Many off-label uses could arise for HICPAC’s consideration. How should HICPAC approach this situation? For example: a strong RCT is conducted for a product, but in an area for which there is no label claim. Will HICPAC consider that device?

Ms. Janssen clarified that the algorithm is intended to focus on devices and products that are not used for treatment per se, as opposed to pharmaceuticals.

Dr. Bell added that the Healthcare Personnel document is the only HICPAC product that refers to administering medication. The statement regarding prophylactic use of antimicrobials is a “one-off” in this case. At some point in the future, however, HICPAC might address vancomycin locks, which is a different scenario from recommending drug administration. It is not within HICPAC’s purview to advise clinicians regarding the treatment of individual patients. Their professional society partners that focus on clinical treatment of patients make recommendations

related to patient care. Medication administration notwithstanding, off-label use of devices and products does not necessarily have to be a “hard stop” for HICPAC, if there is powerful evidence to support off-label use of a device or product for preventing infections.

The draft nodes that address product use and label claims are not designed to be “stop or go forward” decision points; rather, they focus on assessing and understanding the label claim. For example, antimicrobial sealant has a label claim for decreasing skin colonization and does not have a claim related to preventing surgical site infection (SSI).

SIS noted that many devices are designed to replace existing devices and claim the same efficacy, but are either easier to use or are less expensive. For example, if a company develops an antibiotic- or antiseptic-bonded catheter that has similar infection prevention properties to another catheter, but could be sold for \$2 cheaper, the new catheter will probably be considered superior. Would HICPAC recommend the new product over the existing product based on non-infectious disease considerations?

This issue could be addressed in Item L in the draft document, which assesses whether findings are generalizable to a class of products versus a single product. Cost was not listed as an example in the document because cost variations can be large. HICPAC would not issue a recommendation for one similar device over another based solely on cost. It would be difficult for a national group to incorporate the spectrum of cost variances into a recommendation. HICPAC could state that individual facilities may evaluate the cost of implementing a product within their systems.

Ms. Janssen suggested that cost should not be ignored, but should be a tertiary consideration. HICPAC could recognize that a product may be costly or not feasible for wide implementation for other reasons. The rationale for these conclusions should be articulated in a transparent manner.

FDA clarified that it does not regulate hospital practices. FDA’s regulatory process stops after a medical device is cleared, approved, or granted to be placed on the market. FDA does not recommend off-label use within its regulatory process, but the agency does not state that clinicians cannot use devices in ways beyond their label claims. FDA’s regulatory process is based upon an evaluation of whether a device is safe and effective. When they consider labeling pertaining to infection control, the labeling is for medical devices with added product. If a company comes to FDA with a certain claim, the company has to provide supportive *in vitro*, animal, and clinical testing data. FDA spends weeks reviewing the data. If a product is added to a medical device, FDA will consider every aspect of the product, from the chemical kinetics of the device to biocompatibility. FDA therefore does not recommend off-label use, as they rely on data provided by the product sponsor to support a label claim.

Public Comment

William Rutala, PhD, MPH, CIC

HICPAC Member, 1999-2003

Research Professor, University of North Carolina School of Medicine

Director, Statewide Program for Infection Control and Epidemiology

Dr. Rutala introduced himself and spoke to HICPAC about two current issues in disinfection and sterilization.

A shift is likely to occur from high-level disinfection to sterilization of endoscopes. There has been a great deal of discussion of this shift in recent years by professional organizations, manufacturers, governmental agencies, and panels. The critical need for this transition has also been discussed in various peer-reviewed publications, including *JAMA*, *Infection Control and Hospital Epidemiology (ICHE)*, and the *American Journal of Infection Control (AJIC)*.

The justification for this transition is multi-fold:

- 1) Endoscopes have been associated with more outbreak infections than any other reusable medical surgical device, with over 130 outbreaks attributed to them.
- 2) Evidence-based endoscope reprocessing guidelines have been prepared, but data demonstrate that all of the steps associated with manual endoscope reprocessing are rarely performed. In fact, one study showed 1.4% compliance with the 12 essential steps of manual reprocessing.
- 3) Recent microbiological surveillance data of GI endoscopes demonstrate endoscope contamination rates greater than 30%, and all endoscopes examined had visible irregularities that reduced microbial exposure to disinfectants and sterilants.
- 4) The margin of safety associated with reprocessing is nonexistent, or less than zero. Studies have demonstrated that the internal channels of GI endoscopes are contaminated from 10^{7-10} microorganisms, or 10 million to 10 billion microorganisms. Based on the literature pertaining to cleaning and high-level disinfection, as little as 10^6 microorganisms are removed or inactivated, leaving a level of contamination of 10,000 organisms. Sterilization will provide a margin of safety, as sterilization provides a 10^{12} reduction of microorganisms, including spores; whereas, high-level disinfection results in a 10^6 reduction, with the margin of safety being 10^6 .

These points support the clarification of critical definitions in the Spalding Scheme from “Objects which enter sterile tissue should be sterile,” to “Objects which directly or indirectly enter sterile tissue should be sterile.”

The other current issue in disinfection is the correct interpretation, based on the EPA registration testing methodology, of the contact time, or “wet time,” for liquid disinfectants used for surface disinfection versus the treatment time – undisturbed time, not wet time – for wipes and sprays used for surface disinfection. The registration test used for liquid disinfectants is the AOAC Use Dilution Test, and the contact time should be the wet time. This particular test simulates the contact time in the test tube with the inoculated carrier. The registration tests used by the EPA for sprays and wipes are the EPA Disinfectant Towelette Test and the Germicidal Spray Test, respectively, and the label claims should be interpreted as treatment time, not as wet time. If a product is a liquid disinfectant, such as a dilutable quaternary ammonium compound, and the label indicates an EPA registration label based on the Use Dilution Test of 2 minutes, then that treated surface should remain wet for 2 minutes. In contrast, if a disinfectant wipe or spray has an EPA registration time of 2 minutes, then the surface which is wiped or sprayed should be allowed to remain undisturbed for the EPA registration time of 2 minutes. The duration of wet time is not relevant.

Infection preventionists, instrument reprocessing technicians, environmental service workers, nurses, regulators, professional organizations, and accrediting agencies serving healthcare facilities should be aware of both of these issues. Ideally, HICPAC can support the shift from disinfection to sterilization of endoscopes and the correct interpretation of the contact time for liquid disinfectants versus the treatment time for wipes and sprays.

Liaison Representative / *ex officio* Member Reports

American College of Occupational and Environmental Medicine (ACOEM)

ACOEM recently published a position paper titled, "Interaction of Health Care Worker Health and Patient Health and Safety in the US Health Care System: Recommendations From the 2016 Summit 8/29/2017." Regarding advocacy, ACOEM weighed in on Occupational Safety and Health Administration's (OSHA) Voluntary Protection Programs in September 2017. In addition, ACOEM addressed correspondence from the Chair and Ranking Member of the Senate Committee on Environment and Public Works expressing concern over Bills 263 and 452, which essentially would delay until 2025 the recently lowered ozone standard and would decrease the frequency at which EPA is able to revisit national ambient air quality standards for priority air pollutants from 5 years to 10 years, regardless of the evidence that might accumulate during that time.

America's Essential Hospitals (AEH)

AEH continues to actively promote CDC information to its members nationally through various channels, including social media. As part of Sepsis Awareness Month in September, AEH delivered messaging to encourage healthcare professionals, patients, and caregivers to recognize the signs of sepsis and to act quickly when an infection is detected. This effort included staff participation in a Twitter chat hosted by CDC. AEH pushed information to its members about the CDC/Medscape continuing education program and injection safety video series designed to help healthcare professionals understand proper infection control procedures and how to apply them in practice. AEH was happy to see that two of its member hospitals, MetroHealth in Cleveland, Ohio, and Oregon Health and Science University, were among the featured speakers for two online training modules launched by SHEA and CDC to improve decision-making during outbreaks. AEH continues to maintain its online Zika resource page. This page is updated regularly with new information and materials. AEH is adding an opioid resource page to its website as well. AEH is pleased to see that five of its member safety net hospitals were among those awarded funding from CDC to fight antibiotic resistance. These hospitals do innovative work with the resources they have and the populations they treat.

Agency for Healthcare Research and Quality (AHRQ)

AHRQ continues to support research and implementation projects to develop improved methods and tools to combat antibiotic resistance in three domains:

- 1) Promoting antibiotic stewardship
- 2) Preventing transmission of resistant bacteria
- 3) Preventing HAIs

AHRQ is pleased to see increasing numbers of applications to its new Combating Antibiotic-Resistant Bacteria (CARB)-specific RO1 and R18 Funding Opportunity Announcements (FOAs) in addition to its renewed HAI prevention-focused FOAs.

Regarding implementation, AHRQ has three ongoing national projects:

- The AHRQ Safety Program for Improving Antibiotic Use aims to apply CUSP to the concept of antibiotic stewardship. This project is in a pilot period in 30 sites and three integrated delivery systems, including acute care hospitals, long-term care facilities, and ambulatory care settings. AHRQ is currently recruiting 250 to 500 facilities to participate in acute care hospital cohorts starting in December. Long-term care and ambulatory cohorts will follow in December 2018 and December 2019, respectively.

- The AHRQ Safety Program for Improving Surgical Care and Recovery adapts CUSP to improve outcomes in surgical patients by implementing evidence-based enhanced recovery protocols in hospitals. Enhanced recovery pathways include preoperative, intra-operative, and postoperative practices that can decrease complications, including SSI, and accelerate recovery. This five-year project aims for implementation in 750 hospitals nationwide, addressing a variety of surgeries in a phased approach. The first cohort is ongoing and is focusing on colorectal surgeries in 180 hospitals. Preparations are underway for expansion to orthopedic surgery in the next cohort, which will begin in early 2018.
- The AHRQ Safety Program for Intensive Care Units (ICUs) Preventing CLABSI and Catheter-Associated Urinary Tract Infection (CAUTI) began in September 2015 and aims to reduce CLABSI and CAUTI in ICUs with persistently elevated rates of these infections. Thus far, over 300 ICUs have been recruited to participate from four HHS Regions. A task order contract was recently awarded to expand this project to all 10 HHS Regions. This expansion will involve another 450 to 600 additional ICUs.

Association of Professionals of Infection Control and Epidemiology (APIC)

APIC celebrated International Infection Prevention Week on October 15-21, 2017, and expressed gratitude to everyone who partnered with them on the theme, which was antibiotic resistance.

Association of State and Territorial Health Officials (ASTHO)

ASTHO continues to build on HAI prevention efforts by providing support to state health agencies as they promote sound public health policies and build strong partnerships. ASTHO is working in collaboration with the CDC to develop tools and collect best practices relating to the detection, investigation, control, and prevention of HAIs in states. Some products of these collaborations include co-leading the Council for Outbreak Response: Healthcare Associated Infections and Antibiotic Resistant Pathogens (CORHA) with CSTE. CORHA will soon launch a website which will house tools, resources, and information about the Council's membership. An all-member meeting is scheduled for November 3 - December 1, 2017, in Atlanta, Georgia. In addition, ASTHO and DHQP are co-leading a project aimed at exploring the nature of states' HAI and antibiotic-resistant pathogen outbreak reporting policies. This project consists of a series of qualitative interviews with key informants in seven states. The information gathered from these interviews will be used to inform a report on how the existence, content, language, and structure of an outbreak reporting policy influences the reporting of HAIs and antibiotic-resistant pathogen outbreaks to public health.

Centers for Medicare and Medicaid Services (CMS)

The new CMS Universal Infection Prevention and Control Surveyor Training course is now available to providers. Providers can access the course on the Integrated Surveyor Training [Website](http://surveyortraining.cms.hhs.gov) (ISTW): <http://surveyortraining.cms.hhs.gov>. Once on the home page, click on "I am a Provider." Click on the Course Catalog link at the top of the page. In Search Courses, type "Universal Infection Prevention and Control." Click on the course, then click "launch course" to begin. Additional courses are available at this site.

CMS disseminated information regarding the New [CMS *Legionella* Requirement for Hospitals, Critical Access Hospitals, and Nursing Homes](https://www.cms.gov/Outreach-and-Education/Outreach/FFSPProvPartProg/Downloads/2017-10-19-eNews.pdf) (<https://www.cms.gov/Outreach-and-Education/Outreach/FFSPProvPartProg/Downloads/2017-10-19-eNews.pdf>) through the [Medicare Learning Network® \(MLN®\)](https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNGenInfo/index.html) (<https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNGenInfo/index.html>). The information includes four resources that

CDC and CMS worked on together:

- [Water Management Fact Sheet](https://www.cdc.gov/legionella/water-system-maintenance/wmp-fact-sheet.html) (<https://www.cdc.gov/legionella/water-system-maintenance/wmp-fact-sheet.html>)
- [Legionella Fact Sheet](https://www.cdc.gov/legionella/water-system-maintenance/growth-and-spread.html) (<https://www.cdc.gov/legionella/water-system-maintenance/growth-and-spread.html>)
- [Frequently Asked Questions](https://www.cdc.gov/legionella/water-system-maintenance/healthcare-wmp-faq.html), (<https://www.cdc.gov/legionella/water-system-maintenance/healthcare-wmp-faq.html>)
- [From Plumbing to Patients](https://www.cdc.gov/hai/prevent/water-management.html) webpage (<https://www.cdc.gov/hai/prevent/water-management.html>)

The [surveyor training](https://surveyortraining.cms.hhs.gov/pubs/Videoinformation.aspx?id=134&cid=0CMSLEGWEB-Archived) (<https://surveyortraining.cms.hhs.gov/pubs/Videoinformation.aspx?id=134&cid=0CMSLEGWEB-Archived>) for this new requirement is comprised of an hour-long webinar presented by Karen Hoffmann about *Legionella*, water management programs, and other opportunistic water pathogens. This interesting webinar is beneficial not only for the infection control community, but also for facilities that have questions about how to implement a water management program in order to be in compliance with the new requirement.

Council of State and Territorial Epidemiologists (CSTE)

CSTE reported that as of January 2018, Carbapenemase-Producing Carbapenem-Resistant *Enterobacteriaceae* (CP-CRE) will be nationally notifiable. CSTE has been working with state health departments to operationalize this change. CORHA is engaged in ongoing work. The Antimicrobial Resistance Surveillance Taskforce (ARSTF) has developed three major working groups for the next steps of planning, collaboration, and action to achieve its strategic objectives. The Drug Diversion Toolkit has been developed and finalized to provide guidance to state and local health department HAI programs in the event of drug diversion by healthcare personnel. Work is underway to update the DAPS Toolkit.

Consumers Union (CU)

Since the last HICPAC meeting, CU held its 12th annual meeting of patient safety advocates in New York. The meeting focused on an array of medical harm issues. The meeting included panels, sessions, and discussions about public reporting, transparency, and accountability with regard to HAIs. The *Consumer Reports* publication regularly posts articles online about infections, including an article on how to fight fungal infection, an article on protecting against *C. difficile*, and a guide for how individuals can protect themselves from infections such as influenza in the winter. *Consumer Reports* magazine is posting consumer-facing information regularly, and much of the content includes infection-related issues.

CU's Food Safety Team was part of a collaboration with other organizations to release their annual antibiotics use report card, called "Chain Reaction," in September 2017. More than half of the top 25 restaurant chains in the US have taken steps to restrict the routine use of antibiotics in the production of chicken that they serve. That number is higher than last year, but few commitments have been made regarding antibiotic use in beef and pork. Of the 25 top restaurant chains, 11 received the grade "F" for failing to adopt or disclose an effective antibiotic stewardship program. There nevertheless seems to be some progress in this area, at least in the fast food restaurant market.

Department of Veterans Affairs (VA)

No verbal report was provided.

Food and Drug Administration (FDA)

FDA continues its work with sponsors and manufacturers of the heater-cooler systems. FDA also continuously works with its partners at CDC. FDA's work includes issues related to the reprocessing of scopes, steadily working with the manufacturers of scopes and the manufacturers of high-level disinfectant and automatic endoscope reprocessors.

The agency has been active with its partners, including CDC and others, in hurricane relief efforts. FDA has many sponsors and manufacturers in areas that were hit by the hurricane, so they have sent inspectors to assist the manufacturers to ensure that their devices are still safe and effective.

Within the infection control community, FDA has been working with its partners in industry and hospitals to expand the knowledge base related to the sterility assurance of medical devices. This concept encompasses the total product lifecycle of a device, which begins with manufacturing and continues through the post-marketing cycle. From those partnerships, FDA has started a program to bring physicians and patients to the agency to talk to reviewers. FDA is in the process of visiting the manufacturers of devices throughout the US. They are engaged in discussions and training on both ends; that is, FDA is training the manufacturers, and the manufacturers are training FDA pertaining to infection control and sterility assurance of devices.

Health Resources and Services Administration (HRSA)/Federal Office of Rural Health Policy (FORPH)

CDC and FORPH are conducting a joint webinar on "Successful Best Practices of Antibiotic Stewardship for Critical Access Hospitals" on November 16, 2017, at 2:00 pm as part of National Rural Health Day on November 16th and Antibiotic Awareness Week, November 13-19, 2017. Two critical access hospitals will participate: one from Colorado, and one from New York.

Infectious Diseases Society of America (IDSA)

IDSA highlighted two items:

- 1) The Fellowship in Stewardship and Resistance program that IDSA shares with SHEA and PIDS, which IDSA thinks is an innovative approach to addressing this challenge
- 2) IDSA's launch of the Antimicrobial Stewardship Centers of Excellence Program, which designated the first two centers for their achievements on November 2, 2017: Providence Saint John's in Santa Monica, California, and Summa Health in Akron, Ohio. The core criteria for the IDSA Antimicrobial Stewardship Centers of Excellence build upon the criteria detailed in CDC's Core Elements of Hospital Antibiotic Stewardship Programs. The goals of the program are not only to recognize those who have achieved high standards in their stewardship programs, but also to highlight the value of stewardship of the valuable, but vulnerable, drug supply.

National Association of County and City Health Officials (NACCHO)

Since HICPAC's last meeting, NACCHO has developed the *Healthcare-Associated Infections: A Toolkit* for local health departments. The toolkit provides guidance, best practices, tools, and resources for expanding activities related to improving local infection control, preparedness, and response.

NACCHO continues to work with three HAI demonstration sites in Florida, Illinois, and Pennsylvania. The Florida Department of Health-Orange County (DOH-Orange) is developing a report from a social network analysis using Medicaid data provided by CDC. DOH-Orange is also developing a toolkit to help other local health departments replicate the process. DOH-

Orange is also developing an ROI toolkit based on the findings from a local cost-based analysis for HAI events. Given the discussion on cost during this HICPAC meeting, this work will be timely for NACCHO.

National Institutes of Health (NIH)

No verbal report was provided.

Public Health Agency of Canada (PHAC)

A major portion of PHAC's work focuses on antimicrobial resistance. Infection prevention and control is one of the four pillars in the framework for combating antimicrobial resistance, and PHAC is working closely with WHO and other member states to move agreements forward. In addition to concerns regarding antimicrobial use and resistance, in Canada there are concerns regarding resistance to tuberculosis (TB) drugs. TB is a major issue in the North.

In the area of guideline development, PHAC is updating its CRE guidance. Further, PHAC has drafted general *C. auris* guidelines to address concerns about *C. auris* and how to approach it. Disinfection is among the more significant challenges. There were a number of presentations on disinfection at IDWeek, reflecting the high levels of interest in this area. PHAC is also updating its *Occupational Infections Guideline*, which is very similar to HICPAC's, and PHAC is learning lessons from HICPAC about important areas for attention, especially regarding discussions of the level of evidence and how much time should be spent on different sections. PHAC's guideline, *Management of Healthcare Workers Infected with Bloodborne Pathogens*, will soon be submitted for public consultation. The development process of this document was long, but it is strong. PHAC will share it with SHEA and CDC. After comments are received and incorporated, the Guideline will be translated and approved.

PHAC has done extensive work in medical devices and appreciated the opportunity to speak with FDA, because a device has been approved in Canada for UV disinfection of ultrasound probes. The interface between the infectious disease/infection control community and the regulators is an area that needs to be strengthened. PHAC enjoyed the conversation regarding the types of questions that should be asked. These issues are complex in Canada, where regulators fall under certain legislation, the federal government is under another legislation, and healthcare is provincial.

HAI measurement and reporting is another important area for PHAC. Each of the provinces and territories has different requirements for reporting, they calculate rates differently, and information is extracted from health records differently. The Canadian Patient Safety Institute plays a role in this work as well. PHAC is trying to bring these groups together to pursue common messaging and to identify quality data.

Society for Critical Care Medicine (SCCM)

SCCM is signing a subcontract with the AHA Health Research Education & Trust (HRET) to serve as expert advisors to the *On the CUSP: Stop CAUTI* campaign. SCCM's 47th Critical Care Congress will be convened in San Antonio, Texas, in February 2018. A public health event will be held before the 47th Critical Care Congress. The event, titled "Save a Life," is presented in collaboration with the City of San Antonio, and local hospitals and colleges will participate. CDC has offered to provide public materials from the *Get Ahead of Sepsis* campaign, a contribution for which SCCM is grateful.

Society for Healthcare Epidemiology of America (SHEA)

Registration is open for the SHEA Spring 2018 meeting to be held in Portland, Oregon, April 18-

20, 2018. The theme continues to be “Science Guiding Prevention.” Abstracts are being accepted and there are several opportunities for scholarships to assist people to attend the meeting.

The SHEA/COC Outbreak Response Training Program (ORTP), which is supported by a contract with CDC, has been active. ORTP has conducted three webinars to date. One in-person training workshop was held in June 2017. A second workshop will be held in January 2018 in Los Angeles, California. Two decision simulation online modules were recently launched. These modules are open to anyone and can be accessed [online](http://ortp.sheaonline.org/online-training/) (<http://ortp.sheaonline.org/online-training/>). The expert guidance document, “Outbreak Response and Incident Management: SHEA Guidance and Resources for Healthcare Epidemiologists in United States Acute Care Hospitals” will be published soon. It has been reviewed and cleared by CDC. In addition, digital toolkits have been prepared.

The second Antimicrobial Stewardship Research Workshop will be November 15-16, 2017, in Chicago, Illinois. The third workshop will be November 13-14, 2018, in Baltimore, Maryland. Additional information is at the workshop [website](http://www.asresearchworkshop.org/) (<http://www.asresearchworkshop.org/>).

SHEA’s Antimicrobial Stewardship Podcasts launched in January 2017 and feature four discussions on practical approaches and applications in stewardship:

- 1) Focusing Stewardship to Help Tackle *Clostridium difficile*-associated diarrhea was released in January
- 2) System Change or Social Change Podcast will be released in October
- 3) Upper Respiratory Infections and the Role of Antimicrobials Podcast will be released in November
- 4) The Big Picture on Urinary Tract Infection (UTI) Podcast will be released in December.

The “Primer on Healthcare Epidemiology, Infection Control and Antimicrobial Stewardship” is being updated and is anticipated to be available in 2018.

The SHEA Guidelines Committee has been working on several pieces of what SHEA calls “Expert Guidance.” *Expert Guidance: Duration of Contact Precautions* has been submitted to ICHE. For *Expert Guidance: Infection Prevention Practices in the Anesthesia Work Area*, recommendations are being finalized and the manuscript is in process. *Expert Guidance: Initiation of Antibiotics in Long-Term Care* is in the early phases. Four companion white papers are planned for the HICPAC NICU Guideline. The patient education brochures developed during the 2014 Compendium Update have been cleared by CDC and approved by the Compendium Partners: IDSA, APIC, AHA, and TJC. These brochures will be available in English and Spanish.

Upcoming SHEA commitments include updates to the following:

- Guideline on Management of Healthcare Workers Infected with HIV, HBV, HCV 2017 review statement posted [online](http://www.shea-online.org/index.php/practice-resources) (<http://www.shea-online.org/index.php/practice-resources>)
- 2008 SHEA/APIC Guideline on Infection Prevention in LTC
- 2008 CDC Guideline on Sterilization and Disinfection
- Recent reviews SHEA has done with other societies include:
 - Association of Medical Microbiology and Infectious Disease (AMMI Canada) Asymptomatic Bacteriuria Stewardship Initiative

- Association of periOperative Registered Nurses (AORN) high-level disinfection guideline
- AORN Medication Safety guideline
- IDSA/SHEA *C. difficile* treatment guideline
- WHO Preferred Product Characteristics for Healthcare Worker PPE for viral hemorrhagic fevers in tropical climates

Regarding its legislative agenda, SHEA continues to advocate for robust and strong federal funding for CDC, AHRQ, and NIH in support of medical research and public health prevention initiatives and state-level infrastructure needs.

In terms of regulatory policy, SHEA has been looking at an update of the long-term care interpretive guidelines for the CMS State Operations Manual (Appendix PP) that was released in August. SHEA is analyzing these updates and will develop tools and resources for SHEA members.

SHEA has engaged in a number of press activities and hopes to release two textbooks in 2018. In addition, SHEA's slate for new members beginning January 1, 2018, includes:

- Vice President: David Henderson, MD, Clinical Center, National Institutes of Health
- Councilors:
 - Gonzalo Bearman, MD, MPH, Virginia Commonwealth University Health
 - Aaron Milstone, MD, Johns Hopkins University
- International Councilor: Mirian DalBen, MD, Hospital Sirio Libanes
- Community Based Healthcare Epidemiology (appointed non-voting): R. Scott Stienecker, MD, Parkview Health

Society of Hospital Medicine (SHM)

SHM continues to work with HRET and AHRQ to combat and reduce HAIs in hospitals and ICUs. SHM also continues to promote its *Fight the Resistance Campaign* and recently developed an antibiotic stewardship Implementation Guide, including educational modules for hospitalists to help implement stewardship programs in their hospitals.

Surgical Infection Society (SIS)

The Heather Evans-led project "Assessing the use of patient generated health data and mobile devices for surgical site infection clinical decision making and surveillance" has been funded as a task order by the CDC for approximately \$600,000. Using Health Technology Assessment (HTA) methodology, this project, known as ASSIST, will make inroads into the logical and consistent use of patient-generated health data, especially imaging, in the diagnosis, definition, and management of SSIs. Dan Pollock from CDC/DHQP has been outstanding in helping SIS work through this process. It is hoped that in approximately two and a half years, the project will yield exciting data and ideas about how patient-generated health data can be used to help manage surgical infections.

Adjourn

With no additional comments or questions posed, HICPAC stood in recess at 4:20 pm.

Thursday, November 9, 2017

Welcome and Roll Call

Dr. Diekema called the second day of the HICPAC meeting to order at 9:12 am on Thursday, November 9, 2017. A roll call of HICPAC members, *ex officio* members, and liaison representatives established that a quorum was present. Quorum was maintained throughout the day. No new conflicts of interest were declared by HICPAC members.

Respiratory Infection Transmission Precautions

Michael Bell, MD

Deputy Director

Division of Healthcare Quality Promotion

National Center for Emerging and Zoonotic Infectious Diseases

Centers for Disease Control and Prevention

Dr. Bell described important points to consider regarding CDC's Respiratory Infection Transmission Precautions.

He shared a photograph from Seoul during the Middle East Respiratory Syndrome (MERS) outbreak. He pointed out that the workers in the photo were wearing one-piece coveralls, filtering face-piece respirators, goggles, and non-sterile gloves, and had tape around their legs. That apparel is extreme for a respiratory virus, as are similar ensembles used for severe acute respiratory syndrome (SARS) and pandemic influenza. Currently, the HICPAC recommendations in the [isolation guideline](https://www.cdc.gov/infectioncontrol/guidelines/isolation/index.html) (<https://www.cdc.gov/infectioncontrol/guidelines/isolation/index.html>) for seasonal influenza and similar respiratory viral infections state to use droplet precautions when entering a room. Only a mask is required, and the recommendations do not mention eye protection. Caveats are provided for SARS, avian influenza, or pandemic influenza.

V.C.3.: Use of personal protective equipment

- Recommendation V.C.3.a.: Don a mask upon entry into the patient room or cubicle (Category IB)
- Recommendation V.C.3.b.: No recommendation for routinely wearing eye protection (e.g., goggle or face shield), in addition to a mask, for close contact with patients who require Droplet Precautions (Unresolved issue)
- Recommendation V.C.3.c.: For patients with suspected or proven SARS, avian influenza, or pandemic influenza, refer to the following websites for the most [recent] recommendations [These links are no longer active: www.cdc.gov/ncidod/sars/; www.cdc.gov/flu/avian/; www.pandemicflu.gov/]. Similar information may be found at [Severe Acute Respiratory Syndrome \(SARS\)](https://www.cdc.gov/sars/index.html) (<https://www.cdc.gov/sars/index.html>); [Pandemic Influenza](https://www.cdc.gov/flu/pandemic-resources/) (<https://www.cdc.gov/flu/pandemic-resources/>); and [Pandemic Awareness](http://www.flu.gov/pandemic/) (<http://www.flu.gov/pandemic/>), accessed November 3, 2016.]

The only alternative to Droplet Precautions as currently presented is Airborne Precautions, which are not needed for most respiratory infections.

When CDC has released interim guidance for SARS, MERS, or Novel Influenza A, the rationale

for the guidance statements is that CDC adopts a more careful approach for pathogens for which there is no vaccine to protect the population. If many people become sick, resources such as antivirals, ventilator support, and intensive care capacity could be strained. These guidance documents are created in the context of a high mortality/high morbidity type of disease. In context, the careful approach is rational; however, when the guidance is mapped back to droplet versus airborne precautions, there is no element in routine guidelines to capture the approach that straddles the lines between Droplet and Airborne precautions.

The current binary approach to infection control for respiratory pathogens was valuable a generation ago when the goal was to bring the field toward uniform adoption of consistent practices. That simplicity has value, but it can conflict with refinements of infection transmission knowledge. During a crisis in particular, we do not want infection prevention personnel to be constrained by historic limitations that are not a good fit with the latest science.

The field of infection control risks losing credibility if we continue to refer to droplets falling after traveling three feet and no longer being a threat for inhalation. That does not reflect what is known about aerosol science, but old information is still bundled with our recommendations. The evidence base for changing these statements is, admittedly, not robust, with indirect evidence and nothing on the order of RCTs. It is recognized, however, that aerosols come in a range of sizes; they float for a good deal of time; the durability of respiratory pathogens in the air is variable according to humidity and environmental conditions; and the size of the droplet itself matters in terms of protective equipment (e.g., masks).

In considering “serious threats” and the potential to inhale something infectious while in close contact with a patient, there is not a direct “cutoff” distance; approximately 2 meters or 6 feet is currently accepted. A sneeze can project visible material at least 4 to 5 feet, so it is not unreasonable to say that inhalation is a concern when someone is in a small room with a potentially infectious person, performing a procedure or an examination.

Surgical masks do not prevent inhalation of infectious material; they prevent direct exposures. Further, eye protection should be considered in the context of respiratory virus transmission because of tear ducts and the anatomic connections between the eyes and respiratory system.

These concepts are presented to HICPAC for discussion because of the pragmatic issues being faced by the field and by CDC. Concerns extend beyond seasonal influenza: multiplex tests identify a wide array of respiratory infections, and parainfluenza or a pathogen as presumably commonplace as rhinovirus can cause serious outcomes among patients in hospitals.

There are concerns regarding initiating this level of precaution for patients who present to hospitals with respiratory complaints during respiratory infection season, as many respiratory complaints cannot be classified. This issue is not tidy, but it cannot be ignored. HICPAC will need a deliberate plan to address this open question. There is meaningful evidence to support this process, and we would like to move forward with a combination of pragmatism and the best interests of healthcare personnel and patients.

Aerosol generation is another area of concern. Aerosol-generating procedures were a focus area during the SARS outbreak. At that time, several procedures were undertaken by people who subsequently became infected with SARS-CoV. Documentation of the aerosol generation for procedures such as intubation, bronchoscopy, or even nebulizer treatments, has not been strong. CDC has therefore invested through the EpiCenters in studies to measure aerosol generation during procedures. It is hoped that the results of these studies will help them provide

indications for respiratory protection or negative pressure isolation spaces during specific procedures.

Dr. Bell asked HICPAC to reflect on how to approach precautions for routine patient care and for healthcare facility admissions. Seasonal influenza is a good starting point for the conversation. He was also interested in hearing HICPAC's thoughts regarding the burden of infectious individuals presenting to facilities; the seriousness of some of those infections; the secondary implications of uncontained infections; and the implications of greater investment in the use of respiratory protection, especially in the pediatric realm.

On an unrelated note, Dr. Bell described ongoing conversations about how the committee's thoughts can be more efficiently brought to light. There could be an opportunity to harvest from each HICPAC member, on a systematic basis, two to three issues that affect patient care, quality or safety in healthcare settings. From that list, HICPAC could then select the "Top 10" issues for that quarter or year for highlighting on the HICPAC website. That list can generate conversation, be used in media, and elevate the profile of issues of concern without waiting for published evidence to generate a statement. This effort could be presented in other ways, but it could be a powerful tool for HICPAC.

Discussion Points

HICPAC Feedback

The idea of creating a syndromic-based set of respiratory precautions is appealing. The current system is confusing, with different precautions for RSV, adenovirus, influenza, etc.

Investigators studying aerosol generation from procedures have presented preliminary data on bronchoscopy and non-invasive ventilation. They report little aerosol generation of small particles. Aerosol generation may differ in different settings. The engineers working with the investigators in the hospital setting were impressed by the air quality in the hospital, where there were relatively few "background particles," compared to the outdoors and other research-focused areas. Testing is conducted at baseline in the room and during a procedure to help determine whether the procedure is generating particles.

The motivation to harmonize recommendations and ensure that they are logical is understandable, but that motivation should not drive HICPAC beyond the current state of the science. Gaps remain in the understanding of aerosol transmission, especially in terms of small and large particles and short- and long-range droplets. Concerns regarding respiratory virus transmission in healthcare primarily stem from difficulty in screening visitors and in identifying infected patients in a timely manner so that precautions can be instituted. Respiratory illnesses are found among healthcare personnel, but not at a level that would be expected if droplet precautions were inadequate to protect them. Many patients in hospitals have respiratory illnesses, so there clearly is a benefit to implementing the wearing of surgical masks in that setting.

It makes sense to take an "abundance of caution" approach, given the lack of clarity about new pathogens and situations.

Perhaps HICPAC could provide guidance on de-escalation of precautions. Facilities tend to be effective at "scaling up," but not at "scaling back down." The 2009 H1N1 influenza pandemic is a good example of this dynamic. Facilities scaled up their precautions and procedures in response to the pandemic, but precautions regarding aerosol-generating procedures and the

use of N95 respirators were added before complete information about transmission was available. No data showed that those steps were necessary or that they provided benefit; the steps remain in the guidance for seasonal influenza every year.

Data are not strong regarding the benefits and impacts of N95 fit testing. It might be wise to re-evaluate this question. Simply wearing a mask might be sufficient, even in settings in which pathogens are known to be airborne. It might be appropriate to de-escalate in other settings. For example, patients are at risk when they are being intubated; however, numerous precautions are implemented after patients are on ventilators, even though their airways are protected and may be at less risk.

The concept of biocontainment should be considered. Ten regional centers in the US were built for containment of high-consequence pathogens, such as Ebola. The National Ebola Training and Education Center (NETEC) and the biocontainment units are wrestling with questions regarding other pathogens, such as MERS coronavirus (CoV), that might trigger activation of the units. While the biocontainment units are an important resource for a pathogen like Ebola, operating them requires significant resources, including redirecting personnel from other areas of the facility. For instance, protocols are currently scaled up in response to hemorrhagic fever, requiring a great deal of PPE, waste disposal, etc. That level of activation may not be appropriate for a pathogen such as MERS-CoV, given that activation of the unit is not only costly and disruptive to other clinical services in the hospital, but it could potentially set a precedent for placing every MERS patient in biocontainment. Perhaps HICPAC should engage in conversations with the NETEC and others who are grappling with these issues.

Moving to a higher level of protection may be warranted, but it is important to consider the practical implications of escalation, such as the impacts of wearing N95 respirators on pediatric nurses in the PICU or on the pediatric floor. HICPAC could work with industry partners to help develop mechanisms for staff members to work 12-hour shifts for several days at that level of respiratory protection.

An additional concern is the problem of presenteeism among healthcare personnel. Higher levels of PPE may be warranted, but there is a need for a systematic approach to threats, with a hierarchy of controls – administrative, environmental, etc. – such as is utilized for TB. A system that could be ramped up and rapidly implemented in the context of a known threat would be beneficial. PPE is important, but other interventions can be put in place that will make it the response more effective and more manageable. Such an approach could reduce the number of infected community members, such as visitors, patients' family members, and healthcare personnel, entering the hospital.

Compliance with isolation precaution procedures is lacking. It was clear during the SARS response, for instance, that exposures were occurring because personnel were not donning and doffing PPE appropriately. Even the most experienced person can be distracted and become contaminated. Students make rounds on the floor and also have lapses, sometimes due to pressures to complete clinical hours in order to graduate. Volunteers are another population to consider. Early training is important for all of these groups to avoid non-compliance or adaptation of isolation precautions.

Testing capabilities have improved since the SARS experience. The challenge is to use testing effectively to identify those who truly need the higher level of precautions, versus those who do not. Tests should be readily available; turnaround time should be rapid; and tests should be

used appropriately.

HICPAC discussed the implications of an “all-hazards” approach to respiratory infection transmission precautions. It is important to consider potential adverse effects for providers, families, and visitors. Some evidence points to psychological harm and erosion of the physician-patient relationship in the context of masks, such as when a physician has a meeting with the family of a terminal patient, and everyone is wearing a mask. It would be worthwhile to know more about the potentially quantifiable and meaningful harms associated with masks.

Individual facilities’ approaches to visitors are driven, to some extent, by physical plant and local culture. Some “low-hanging fruit” could be general guidance on visitor screening. Such guidance cannot be “one size fits all” and would likely be high-level, but little guidance is currently available to help facilities even start to build visitor screening programs.

Some lessons learned from SARS may be more applicable to MERS, given that it is a coronavirus, than to avian influenza. For instance, Bilevel Positive Airway Pressure (BiPAP) can spread virus throughout a room, but it does not seem to be routinely mentioned in discussions about respiratory precautions for seriously ill patients. Time spent in the room during resuscitation and the importance of wearing a face shield are additional issues. There are implications for both influenza and MERS regarding procedures, such as the sequence of donning and doffing, that may not be routinely applied. Hospital staff may not be fully aware of procedures that are critical in these kinds of situations. Visitor transmission played a role in SARS-CoV transmission. Severity of illness is also important given the context of “super-spreaders,” especially as was observed with SARS.

Much of this information already exists; it may not be necessary to create anything new. The information may need to be repackaged so that it is more practical. In addition, guidance should be provided on monitoring, which is required to determine whether frontline workers are adhering to procedures.

Ex Officio/Liaison Feedback

NIH stressed that “one size” will not “fit all,” but some type of syndromic approach will be helpful. NIH has a similar approach. During influenza season, the hospital posts signs instructing persons with any respiratory signs and symptoms to proceed immediately to the nurses’ desk for triage. As therapies become more intrusive and more invasive, patients will be sicker, and respiratory issues that are trivial to most will be significant for those patients. Approximately 70% of the patients in NIH’s hospital are seriously immunosuppressed, so the hospital takes these issues seriously. In the last 15 years, two outbreaks of parainfluenza have occurred, resulting in four patient deaths. It is believed that parainfluenza did not spread in the hospital, but in the NIH Children’s Inn, which has a “family-like” environment.

ACOEM pointed out that for higher-risk agents such as smallpox and hemorrhagic fevers, facilities allow themselves to be guided by the Precautionary Principle, often relying on exceptions rather than consensus. Part of the problem is that the use of an N95 respirator is tied to negative pressure airborne isolation and yearly fit testing. If there were no such thing as droplet transmission, the discussion would probably be about short- and long-range aerosol transmission, and the latter would be less common than the former. Another issue is that OSHA requires annual N95 fit testing. Large healthcare systems therefore conduct fit testing for 10,000 to 15,000 healthcare personnel per year; the requirement represents a significant operational challenge. It has been demonstrated that some respirators fit better “out of the box” than other

respirators fit with fit testing. There is an opportunity to call on manufacturers of N95 respirators to use material that affixes to the skin so that the fit is good “out of the box.” For potentially opportunistic, airborne-spread infections, a level of protection between a droplet and airborne isolation is worth considering.

SHEA agreed with the discussion thus far and urged HICPAC to take a practical approach to these questions. The problems will not be solved if the proposed approaches are not implemented at facilities. Hospitals that conduct frequent tests for viruses rarely find hospital-acquired influenza. Droplet precautions are usually applied, even though not all influenza patients may be identified and isolated. One hospital, for example, struggles with hospital-acquired rhinovirus that is thought to come from presenteeism of ill healthcare personnel. Additional precautions will not address this issue.

PHAC emphasized that the lessons learned from SARS extend beyond PPE. In Ontario, all healthcare personnel wore respirators during the outbreak. Attempts were made in fit checks to make fit testing more palatable. The experts in the field think that this approach was a mistake. The respirator use was implemented because of the Precautionary Principle, because many nurses and other healthcare personnel in the units became sick. Canada’s Core Infection Control Guideline includes routine infection control practices, with risk assessment built into the processes. The core Guideline represents the minimum that should be done, but facilities and healthcare personnel need to think critically about their particular situation. During the H1N1 outbreak, Canada implemented strong precautions early on, and it was difficult to scale them back later. The other lesson from SARS is that visors are worn all of the time. PHAC receives feedback from the field that they are sending mixed, confusing messages.

CDC Feedback

Dr. Helfand commented that her children’s hospital implements both droplet and contact precautions for respiratory illnesses. She initially had questions about the protocol, but because many children have more than one pathogen, the extra precautions are warranted.

Dr. Cardo observed that their discussion reflected how much has been learned from recent outbreak experiences. The concepts that arose during the discussion did not deviate significantly from the current recommendations, but additional perspective may be needed. For example, the need for administrative controls is accepted, but this area may need to be re-emphasized and supported with practical examples. There is also a need to address gaps. Dr. Cardo emphasized the importance of reexamining and revamping the guidance before a crisis, rather than during one.

Dr. Bell thanked the meeting participants for their input and summarized the major discussion themes:

- There are exciting and workable possibilities regarding providing better triage.
- Universal face shield use, which is easy and comfortable, might accomplish as much as, if not more than, surgical mask use
- Rationales should not be outdated or “murky,” as in the example of wearing respirators when a patient is ventilated with an outflow filter and completely closed vent circuit
- Droplet versus airborne precautions and near- versus longer-distance inhalational transmission: it should be noted that the terms “droplet precautions” and “airborne precautions” might themselves be problematic and confusing, as droplets *are* airborne

- More transparency regarding presenteeism in hospitals and other healthcare-associated settings: blunt conversations are needed about presenteeism within communities, patient populations, and healthcare facilities

Dr. Bell looked forward to further discussion with HICPAC.

International Antimicrobial Resistance

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Dr. Cardo described international activities related to antimicrobial resistance.

After CDC published [Antibiotic Resistance Threats in the United States](https://www.cdc.gov/drugresistance/threat-report-2013/pdf/ar-threats-2013-508.pdf) (<https://www.cdc.gov/drugresistance/threat-report-2013/pdf/ar-threats-2013-508.pdf>) and WHO published [Antimicrobial Resistance: Global Report on Surveillance](http://apps.who.int/iris/bitstream/10665/112642/1/9789241564748_eng.pdf?ua=1) (http://apps.who.int/iris/bitstream/10665/112642/1/9789241564748_eng.pdf?ua=1) asking for countries to take specific actions to address antimicrobial resistance, many countries began convening meetings to discuss how to implement programs focused on the issue. Antibiotic resistance was a focus area at the UN World Health Assembly (WHA) two years ago, bringing the issue to a high level. Subsequently, several UN committees have been established to determine how countries can move forward with their implementation plans. At these meetings, Dr. Cardo observed that the initial focus was on new antibiotics. Since then, understanding has grown regarding the importance of infection prevention and improving stewardship, and the conversation has shifted.

Many new investments in Europe are focused on promoting the development of new drugs and other options for treatment, not just antibiotics. While innovation in developing new drugs is important, it is also important to maintain a focus on stewardship and infection prevention. The concept of One Health is embraced by some countries, but not others. Societal expectations regarding infection control and prevention are different in Europe, where some countries, such as Sweden, focus on antibiotics for non-human purposes in agriculture. In other countries, including India and China, antibiotics manufacturers release antibiotics into the environment. Some European countries, such as the United Kingdom (UK) and Germany, are leading the global discussion of antimicrobial resistance, which was a topic at the G20. Dr. Cardo was invited to participate in a meeting to inform German Chancellor Angela Merkel about the importance of antibiotic resistance. The topics of these meetings vary, but it is important for HICPAC members to be aware of them, as HICPAC members may be invited to participate in them.

Most of the new resistance or mechanisms of resistance being identified in the US stem from people coming to the US from other countries, or from US citizens traveling to other countries and returning. Resistance is a global matter; countries must inform each other as soon as they observe an issue so that immediate action can be taken. CDC has sometimes only learned about new pathogens from the literature. CDC and WHO co-funded a Think Tank to convene scientists to discuss strategies to address resistance. Some countries may be ahead in prevention of transmission of specific pathogens such as MRSA, but source countries are not

working on a common program. The US is in a position to move this work forward. The US is doing significant work and can be proactive.

Dr. Cardo recently attended a meeting in Berlin that was organized by Wellcome Trust, in partnership with the UK, Ghana, Thailand, and the UN Foundation. The meeting focused on the environment, and the question posed to her was, "Should we start monitoring what is going on in the environment?" The discussion included observations about pushback from manufacturers that are releasing antibiotics into the environment in some countries, as well as discussion about what to test. Dr. Cardo said at the meeting that she did not think they were ready to start monitoring the environment, because before monitoring is conducted, decisions must be made about the meaning of what is being measured, standardized metrics, and what interventions will be implemented, if intervention is needed.

Dr. Cardo hoped to continue discussing with HICPAC ongoing work in antimicrobial resistance within DHQP, at CDC, and in partnership with other groups. It is important for HICPAC to understand not only the traditional approach that has been taken to preventing infection and improving stewardship, but also how healthcare practices are impacting the environment, and vice versa. These issues are evolving into major international priorities at high levels of government. From low-income to highly developed countries, the threat is recognized, and action is being taken.

CDC is planning its decennial meeting with SHEA. The topic of the meeting, which will take place in 2020, will be "AR: A Global Threat." The meeting goals are not only to learn from each country, but also to determine how to work together to solve the problem of resistance. CDC is working internationally with many groups, and the work will continue to progress.

HICPAC can help DHQP better address these issues in order to be prepared for the future. Dr. Cardo noted that HICPAC can engage in several topic areas. For example, DHQP is involved in a project in Ohio to assess CRE that is escaping from hospital sewage and moving to the river and throughout the environment. HICPAC can help DHQP consider how to move forward.

Discussion Points

HICPAC commented that many acute care hospitals are experiencing challenges associated with who conducts environmental testing. Notable investments have been made in laboratory capacity both nationally and internationally; however, environmental culturing is different from clinical culturing. Clinical microbiology laboratories are being asked to conduct testing that is not appropriately done in clinical laboratories. Many of the options for environmental testing are through commercial laboratories, and the standardization of their protocols is a major issue. This problem was observed during the *Mycobacterium chimaera* (*M. chimaera*) situation, in which different laboratories took different approaches to testing for environmental mycobacteria, leading to inconsistent results. As Dr. Cardo pointed out, testing should not be conducted unless it is actionable. CDC has worked on standardization of environmental sampling of surfaces, cloth, and other items. Continuing these efforts will be a contribution to the field.

HICPAC expressed concern about CDC finding out about a new pathogen when a paper is published about it, and not earlier. There is a need to approach information transfer in a systematic way so that it occurs smoothly.

Dr. Cardo said that CDC is working with WHO, the convener for this work. Improving information transfer represents a culture change, as most of the people identifying new organisms are from academic centers. For them, publication is the output of what they find. Even the US faces the

problem of a lack of information-sharing because of publication concerns. CDC is working with federal partners to find ways to address this dilemma. Many countries are experiencing this dynamic. Additionally, it is important to remember the US is exporting pathogens as well as seeing imported pathogens. Unfortunately, many countries with emerging resistance may not have the laboratory capacity to identify organisms. DHQP's international group is addressing this challenge, working with several countries with limited resources to determine how to improve their capacity, infection control, and systems. The more that testing can be done in the US to identify new problems and determine how to control them, the better.

HRSA appreciated the update about what other countries are doing. It is critically important to look beyond US borders to learn about what other countries are doing about resistance. Rwanda, which is classified as an underdeveloped country, is meeting its Millennium Development Goals (MDGs); there is much to learn from all countries. Regarding publication, many countries do not have sufficient infrastructure to publish academic papers, and there may be a lack of international research papers to help inform work.

PHAC described the experience with *C. auris* as an example of good communication among countries. Canada heard about *C. auris* from CDC early and was able to assemble a group of experts to determine whether there were cases in Canada. They found a case of which they were previously unaware, because it was through a private laboratory. When they found a case, they shared samples. Medical tourism is having an impact in Canada, and they are considering screening for travel histories. Canada has seen imported pathogens from Cuba and India associated with medical procedures, for example. PHAC asked about CDC's plans to address issues related to medical tourism.

Dr. Cardo replied that medical tourism presents challenges in other areas in addition to antimicrobial resistance. Some people who travel to other countries for medical procedures, including tissue transplants, return with major infections. Through the BAA and with the Division of Global Migration and Quarantine (DGMQ), DHQP is assessing the impact of travelers in the emergence of resistance. Medical tourism promotes itself with glamorous images, and it is challenging to compete with that messaging.

Just as CDC provides updates regarding hepatitis transmissions that occur due to injection safety issues, HICPAC suggested that CDC publish cases anonymously. Even if it is challenging to compete with medical tourism advertising, the dangers of medical tourism must be expressed.

Modeling Update: Return on Investment (ROI)

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Dr. Jernigan reviewed DHQP's past and current ROI project portfolio and described challenges and future directions in this field. The goal of DHQP's ROI analyses is to provide information on the economic benefit of preventing HAIs. This information can be used by decision-makers such as healthcare payers, providers, and purchasers; and state and federal government officials to guide policy and investment decisions.

The answer to, “how much does this cost?” or “what is the ROI?” depends on who is asking the question. The perspective upon which cost analysis is based has an impact on the analysis. Traditionally and historically, much of this work has come from the healthcare facility perspective: a facility’s cost that is attributable to HAIs is the excess expenditure for care, minus extra reimbursement from the payer for the infection. Depending on their reimbursement policies, some healthcare facilities may not perceive HAIs to represent a significant disadvantage or cost. The cost of HAI intervention is the cost of implementing preventive practices (e.g., CDC recommendations). Sometimes, implementing these practices can result in a net negative if a facility is getting reimbursed for the infections it is trying to prevent.

The payer perspective has also been prominent in this work. For payers, the cost attributable to HAIs is the excess attributable reimbursement. The cost of HAI intervention for private payers can be incentive payments or discounts for quality improvement initiatives. For CMS, the federal payer, HAI cost is reflected in investments in policy and public health prevention activities, such as the activities that CDC helps fund.

The societal perspective considers not only direct healthcare costs, but also other costs to society, such as changes in insurance premiums, personal income lost due to morbidity and mortality, larger cost to the economy from loss of productivity, quality of life cost, etc. This perspective is not easily incorporated into economic analyses of HAI prevention, but it has garnered attention.

To date, DHQP has been able to utilize linked CMS and NHSN data to quantify the excess attributable reimbursement that CMS pays out for HAIs. Typically, projects in this area have been retrospective cohort studies using combined CDC surveillance data and CMS databases. Some infections can be identified using administrative data; linkage to NHSN data is not required in these cases. Some of the cost estimates resulting from DHQP are:

- Central Line-Associated Bloodstream Infections: \$25,135⁷
- Surgical Site Infections:
 - Post-total hip replacement: \$67,077⁸
 - Post total knee replacement: \$56,771²
 - Colorectal surgery (planned)
 - Hysterectomy (planned)
- Catheter-Associated Urinary Tract Infection
 - ICU: \$8,548⁹
 - Non-ICU: \$1,479³

DHQP has been collaborating with Richard Nelson, PhD, at the University of Utah through a contractual research partnership. DHQP tasked Dr. Nelson with developing a simulation model to determine the attributable cost of antimicrobial resistant HAIs. He uses input parameters – pre-discharge costs, post-discharge readmission costs – that are primarily derived from the literature and CDC data to estimate cost parameters for individual infections and to calculate the estimated number of antimicrobial-resistant HAIs in the US using specific incidence estimates as well as estimates of the number of hospitalizations in the US. Dr. Nelson presented these data at the 2017 IDWeek meeting in San Diego, California. He calculated attributable cost per

⁷ Scott et al. *Health Affairs*, 33, no.6 (2014):1040-1047

⁸ Yi et al. *J Arthroplasty*. 2015 Jun; 30(6):931-8

⁹ Yi et al. *Med Care* 2014;52: 469–478

HAI by pathogen from the payer perspective. It is important to remember that these estimates are highly influenced by the information that is available in the literature. There are gaps in quality of available studies. Steps were taken to improve the quality of the studies that were included, but more work can be done in this area.

Dr. Nelson estimates the total cost of HAIs in the US to be approximately \$4 billion in excess attributable reimbursement.¹⁰ Interestingly, the vast majority of this cost is due to two MDROs: MRSA and *C. difficile*, which is one of the reasons that so much effort is devoted to preventing those infections in the US.

A number of challenges are associated with this modeling work. HAIs can trigger a cascade of indirect events following discharge from the index hospitalization that might result in costs that accrue over time. Dr. Sarah Yi from DHQP studied excess Medicare reimbursement among patients with and without prosthetic joint infection (PJI) following hip or knee replacement.

Dr. Yi conducted a matched cohort study with patients who had no PJI following their surgical procedure, and patients who did have a post-procedure PJI. Dr. Yi went to great lengths to ensure that the patients were comparable at the time they underwent surgery. The two patient groups were similar regarding their average Medicare reimbursement at one and two years before their surgical procedure. Among the group of patients who had a PJI after their procedure, reimbursement increased substantially the year after the infection. This finding is not surprising. The reimbursements for the two groups do not converge again until four years after the procedures, suggesting that the patients with PJIs likely experienced follow-on events. For example, perhaps a patient with a post-surgery PJI went to a nursing home and acquired an infection. Costs such as these are usually not factored into cost modeling.

Capturing all of the costs is another challenge of this work. HAIs can result in transmission events that, in turn, lead to subsequent generations of HAIs in other patients and in other facilities. Transmission events can be invisible during a particular hospitalization, and these secondary and tertiary waves of infections resulting from transmitted pathogens are generally not captured.

Another challenge is that payer/provider cost relationships are unclear, particularly pertaining to the proportion of costs that are shifted to the payer, and whether facilities are seeing practical benefits from HAIs, such as excess reimbursement for complications, additional hospitalizations, etc. Healthcare facilities can make up for excess costs associated with treating HAIs by changing codes. For instance, if a patient has a urinary tract infection (UTI) that results in urosepsis and he enters the unit on a ventilator, the diagnosis-related group (DRG) can be changed to “mechanical ventilation,” which has nothing to do with a UTI. This change will probably more than compensate for the cost of treating the UTI. It is difficult to tease out actual costs to a facility. Healthcare Epidemiologists tell Chief Financial Officers (CFOs) that they are losing money on infections and should invest in prevention programs; however, facilities probably are not losing money. In some cases, they may be benefitting economically from HAIs.

DHQP is also taking steps beyond estimating cost, to predicting ROI. Dr. Rachel Slayton used a mathematical modeling approach to assess the cost-benefit of federal investment in preventing *C. difficile* infections (CDIs), including the cost of implementing and encouraging antimicrobial

¹⁰ Nelson RE et al. The Cost and Mortality Burden of Hospital-Onset Antimicrobial Resistant Healthcare-Associated Infections in the United States. Abstract #466, IDWeek 2017, San Diego, CA

stewardship programs, such as the NHSN Antimicrobial Use and Resistance (AUR) Module, in a particular hospital. Dr. Slayton quantified this value by comparing the outcomes of a cohort with an intervention, attenuating the probability of disease, to a cohort without an intervention in a particular hospital. Her work demonstrates that the federal government saves money if a level of effectiveness is met. Further, as effectiveness increases, cost savings increases. At 50% effectiveness, the cost savings are clear.¹¹

Is it feasible to expect 50% intervention effectiveness? Recent [data from the UK](http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1278944283388) (http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1278944283388) on trends in rates of CDI from 2008-2013 show more than a 50% decrease in CDI with implementation of multi-faceted interventions that are similar to the interventions that Dr. Slayton modeled in her study. This level of effectiveness is achievable, and these results suggest that it makes sense to invest in these programs. With models such as these, it is also possible to estimate the number of infections that can be averted over time, depending upon the effectiveness of an intervention. Those estimates can be scaled up to estimate how many infections would be averted among a group of people, such as Medicare beneficiaries, nationally over time. These estimates can support policy decisions.

States sometimes request evidence from DHQP to show that state-level investments in HAI prevention have benefits. In response to a state request, DHQP modified its model and updated it to incorporate new guidelines, which will impact the analysis. The model also utilized recent NHSN data. The cost of investment in CDI prevention, primarily through CDC grants, was assessed in the state. The model showed that in that state, the cost savings would be approximately \$7 million if the intervention were 25% effective. If the intervention were 50% effective, the cost savings would be approximately \$30 million. These estimates can be helpful in illustrating the importance of investing in HAI prevention to state-level policymakers.

DHQP has also begun to examine the projected burden of HAIs. One project focused on expected rates of SSIs following total hip and knee arthroplasty in the US, assuming no change in infection rates, from 2020-2030.¹² The risk of HAI increases with age; therefore, infection rates will increase as the population ages if there are no mitigating factors. The modeling illustrates that the number of infections drifts upward from 2020-2030, based on projections of population growth and changes in age distribution. This result suggests that in the absence of interventions to prevent SSIs in this group, the number of infections will increase. If interventions are implemented and infections are reduced by 30%, almost 40,000 fewer infections can be expected, saving Medicare approximately \$2.4 billion. This type of modeling can support policy changes or investing in SSI prevention efforts.

Federal regulatory agencies conducting economic analyses of regulations that impact human health often adopt a societal perspective, which includes measuring the economic benefit of mortality risk reduction. These types of analyses most often use the Value of Statistical Life (VSL) measure, which is a monetized measure of the additional cost that individuals would be willing to pay for a small reduction in the risk of mortality. EPA and the US Department of Transportation (DOT) are the Federal agencies that most frequently use VSL in their economic analyses. HHS has not routinely applied VSL to its analyses, but VSL is described in draft guidelines that HHS published in 2017 to inform and advise its agencies on the methods used in

¹¹ Slayton et al. Infect Control Hosp Epidemiol. 2015 Jun;36(6): 681-7

¹² Wolford et al. Projected Burden of Complex Surgical Site Infections following Total Hip and Knee Arthroplasty among Adults in the United States, 2020 through 2030. Abstract # 2217, IDWeek 2017, San Diego, CA

conducting regulatory impact analyses.

VSL is not the value of an individual life; it represents the value of small reductions to the risk of dying from adverse health conditions. For example, if an individual is willing to pay \$800 for a 1 in 10,000 reduction in the risk of dying in the current year, his or her VSL is calculated as:

- $\$800 \text{ willingness to pay} \div 1/10,000 \text{ risk change} = \8 million VSL.

The 2006 EPA VSL estimate was \$7.4 million, and the 2005 FDA VSL estimate was \$5 million.

DHQP also incorporates the societal perspective regarding HAI prevention. A proposed Rule Change was published for comment in the *Federal Register* on June 16, 2016. The proposed change describes implementation of an antibiotic stewardship program in a hospital as a potential CMS Condition of Participation (CoP). To support the proposed change, CMS performed a regulatory impact analysis, using Dr. Slayton's paper on CDI combined with their own data analysis. CMS concluded that requiring acute care hospitals to staff antibiotic stewardship programs would result in net annual savings to Medicare, but that Dr. Slayton's model appeared not to account for the increased Medicare costs that would result from infection control and antibiotic stewardship program-associated reductions in CDI-related deaths. CMS therefore requested data to allow for a more thorough estimation of all effects (i.e., the societal benefits of reduced non-fatal CDI illness and the societal benefits and costs of reduced fatal CDI illness).

There may be concerns about utilizing the VSL, as it is a theoretical projection of how much an individual is willing to pay to reduce his or her mortality, but other federal regulatory agencies apply the VSL to the prevention of deaths from, for instance, air pollution and traffic deaths. Should the VSL be applied to HAI prevention?

Epidemiologists will wonder whether the VSL should be adjusted in order to be applied to HAIs, taking into account the patient population's comorbidities and different life expectancies. Other measures that could be helpful include the Value of Statistical Life Year (VSLY), which is adjusted for the expected lifespan following an infection, and the Quality-Adjusted Life-Year (QALY), which takes into account both additional life years and the quality of those years. These measures are constructed based on surveys of people with various conditions; as far as DHQP knows, however, no surveys have been conducted with people who have HAIs or have recovered from HAIs. It is difficult to determine exactly how to use these types of data, and whether the work compares "apples to apples" or "apples to oranges." Dr. Jernigan acknowledged the complexities and epidemiologic concerns associated with this work, but because these models are requested, and because other federal agencies use these methods to assess the ROI of their intervention programs, the topic is important for HICPAC to hear about, and perhaps to consider.

Dr. Nelson recently published observations based on a review of the literature about the use of dynamic transmission models for economic analysis as applied to HAIs.¹³ His article points out that the most common model types are decision trees or Markov models, both of which assume no interaction among patients, and that the probability of patient exposure to HAIs is constant over time. Neither assumption is likely to be true in the context of the spread of transmissible infectious diseases. Risk of acquiring infection is affected by the amount of contact that

¹³ Nelson, et al. AJIC, published online, <http://dx.doi.org/10.1016/j.ajic.2017.02.035>

individuals have. Interventions for infectious diseases are designed to reduce transmission, progression from exposure to infection, or duration of symptoms. These interventions will therefore influence not only whether treated individuals become sick – a direct effect – but also whether other individuals will be exposed to the disease – an indirect effect. Models that take these transmission effects into account are called dynamic models because the risk, or force, of infection changes over time. Dynamic models are necessary for cost-effectiveness analyses that evaluate interventions affecting a pathogen’s ecology or transmission. Dr. Nelson asserts that dynamic transmission models should be used for cost-effectiveness analyses of HAI, but his literature review identified only a few analyses that have used those models.

DHQP has applied dynamic transmission models in its work. A DHQP collaboration with the University of Utah used an agent-based model of CRE transmission to determine the impact of the delay between the Clinical and Laboratory Standards Institute (CLSI) and FDA revisions of the interpretive criteria for CRE.¹⁴ The study results suggested that the two- to three-year delay accounted for more than 1800 additional CRE carriers in Orange County, California. These data were discussed in Congress and influenced elements of the 21st Century Cures Act.

In another project, the University of Utah used region-based models to assess interventions among long-term acute care hospital (LTACH) patients.¹⁵ This study showed that a successful reduction of CRE transmission among these patients, who comprise less than 10% of the regional facility population, substantially reduced regional CRE transmissions.

DHQP’s Prabasaj Paul is studying the impact of CDC’s new guidance on containment, [Interim Guidance for a Public Health Response to Contain Novel or Targeted Multidrug-resistant Organisms \(MDROs\)](https://www.cdc.gov/hai/outbreaks/docs/health-response-contain-mdro.pdf) (<https://www.cdc.gov/hai/outbreaks/docs/health-response-contain-mdro.pdf>). The guidance’s goal is to identify and contain community MDROs early, introducing contact precautions and other measures to contain the spread. When an MDRO is identified, prevalence studies are conducted in the facility where it was found and at other, connected facilities. Dr. Paul built on an agent-based model based on data from 160 acute care hospitals in a US state. He parameterized the model using data from the NHSN CRE Laboratory-Identified Event Reporting (LabID) and real patient transfer information derived from CMS claims in order to understand how patients moved among facilities and to model the statewide impact of implementing CDC’s guidance. It is assumed that the intervention can be stopped if two consecutive prevalence surveys, conducted approximately every two weeks, find no MDROs. It is also assumed that the intervention can be reinstated if there is a subsequent trigger event.

The simulation output graphed the course of the epidemic according to different levels of intervention effectiveness; days since importation; and total transmissions per day across the region, modeling the pathway with no intervention, and at 5%, 20%, and 50% intervention effectiveness. The modeling showed that as intervention effectiveness increases, the number of transmissions per day decreases significantly. Importantly, if a facility adopts the approach of stopping the intervention after prevalence surveys show no MDROs, the results do not suffer.

This simulation suggests that in a two-year outbreak, this state could follow CDC’s guidance

¹⁴ Bartsch SM, Huang SS, Wong KF, Slayton RB, McKinnell JA, Sahm DF, Kazmierczak K, Mueller LE, Jernigan JA, Lee BY. 2016. Impact of delays between Clinical and Laboratory Standards Institute and Food and Drug Administration revisions of interpretive criteria for carbapenem-resistant Enterobacteriaceae. *J Clin Microbiol* 54:2757–2762. doi:10.1128/JCM.00635-16

¹⁵ Toth DJA, Khader K, Slayton RB, Kallen AJ, Gundlapalli AV, O’Hagan JJ, Fiore AE, Rubin MA, Jernigan JA, Samore MH. The Potential for Interventions in a Long-term Acute Care Hospital to Reduce Transmission of Carbapenem-Resistant Enterobacteriaceae in Affiliated Healthcare Facilities. *Clin Infect Dis*. 2017 Aug 15;65(4):581-587. doi: 10.1093/cid/cix370

and see a notable decrease in newly colonized and infected individuals, and the aversion of thousands of infections. By focusing interventions on the facilities most strongly connected by patient sharing and by adjusting specific measures using prevalence surveys, the effect of transmission reduction could be achieved by targeting only 47 hospitals. These 47 hospitals represent only 29% of the hospitals in the total network and account for only 11% of patient days. It is important to remember that this project is a simulation, with preliminary data. DHQP is still working on this model. An important limitation of the model is that it does not include skilled nursing facilities, which could change the outcome. Dr. Paul is adding skilled nursing facilities to the model and using real data from a state to simulate how often MDROs are transmitted among them.

ROI analyses can be useful for guiding policy and investment decisions. This work requires making parameter estimates in the absence of perfect data. It is important to acknowledge the limitations of the approach, but not to discount the outcomes. The analytic perspective is important: Facility/Program, Payer, or Society. Considering the societal perspective may provide an “apples to apples” comparison of the economic benefits of HAI prevention against an array of other government programs that are designed to improve human health. Dynamic mathematical models should be used more often for economic analysis of HAI prevention. DHQP is investing in this area, having funded a network of external academic modelers to focus on HAI modeling. The results of this work will likely help DHQP better estimate ROI for HAI prevention investments.

Discussion Points

HICPAC emphasized the importance of transparency regarding the assumptions in the models, what drives the assumptions, and maintaining a conservative approach to them.

Dr. Jernigan agreed that models are only as good as their parameter estimates. When publishing these models, it is important to be explicit about each of the assumptions. Usually, references are provided for the literature that was used, how the data were derived, etc. In good modeling, it is important to perform sensitivity analyses on each parameter to determine the result's sensitivity to variation in the parameter. Parameters can be ranked according to their level of influence. Parameters that are highly influential can completely alter a result in a different direction, depending on whether the parameter's value is low or high. DHQP invests in better data that help hone in on the parameter estimate. An example of this work is an agent-based model for CDI transmission in the hospital. The model is sensitive to factors such as the natural history of colonization, incidence of colonization, incubation period when a patient becomes colonized, length of time patients stay colonized, and many other factors about which little is known. DHQP has awarded a contract to improve the measurement of these factors in order to improve the models. Transparency and using the very best data available are important.

Dr. Cardo noted that modeling is used to determine the impact of specific interventions. DHQP does not model a question for the sake of it, but to learn more about important issues, often issues that arose in outbreak situations.

Dr. Jernigan added that the questions that DHQP is asked to address are frequently highly complex. Healthcare is a complex system. Sometimes, traditional epidemiologic methods are not the best tools to answer these questions. Further, traditional epidemiologic methods may not be feasible. In these situations, dynamic models can be especially helpful. Outbreak investigations can inform the direction of modeling work. Outbreak investigations could consider

collecting data specifically for the purpose of improving and parameterizing models to inform future work. For instance, CDC's containment guidance was based on good traditional epidemiology, good principles, expert opinion, etc. It is not possible, however, to conduct an RCT on the impact of that containment strategy. Modeling techniques can shed light on potential impacts. Models can then inform how a strategy might be altered to be more efficient or effective.

HICPAC commended the rigor of this work, and DHQP's commitment to supporting it. From the facility standpoint, cost savings are often dominated by staff savings in terms of labor or facility costs. A common methodological flaw in this work is the use of an average daily cost instead of a marginal daily cost. The first day of an intensive care unit (ICU) stay cannot be prevented, but the last day can, and it is often significantly cheaper.

Dr. Jernigan said that modeling from the facility perspective is particularly challenging because of the great variability in how micro-cost accounting is done from facility to facility. It is difficult to determine those margins across a large number of hospitals. From DHQP's perspective, it is difficult to assess the "bottom line" of how much a hospital is losing or gaining by investing in a prevention intervention without having information about reimbursement. Coding changes are an additional challenge. DHQP has considered examining these questions from a state point of view, but the situation is different because states use Medicaid. Medicaid is more of a health maintenance organization (HMO) model, not a fee-for-service model, with a set amount per enrollee. In this model, costs are "pushed down" to the facility. More work needs to be done in this area: CMS has taken initial steps in the policy arena. Reimbursement policies are not perfectly aligned with prevention measures.

HRSA asked if DHQP has looked at Return on Community Investment (ROCI). Many communities have adopted this perspective because it incorporates residents, the community, and the hospital and conveys savings to CFOs in a more tangible way. One of HRSA's providers has adopted this approach.

Dr. Jernigan replied that when states request analyses, that work is similar to the ROCI. He agreed that modeling results have more impact and meaning when they are "close to home." The state analysis that he described was still from a federal perspective. The modeling demonstrated impact in one state, but the cost savings was at the federal level, not the state level. The complexities associated with the cost to the payer and the cost to local jurisdictions make for a challenging mix.

Public Comment

Kevin T. Kavanagh, MD, MS
Health Watch USA
Somerset, Kentucky

Dr. Kavanagh submitted the following letter for the record:

Dear Dr. Denise Cardo:

We wish to submit this public comment concerning the formulation of a healthcare policy regarding MRSA and Healthcare Staff. Specifically, we would like to express our support for preemployment and periodic screening of healthcare workers based upon the following research and concerns.

We do not feel that using MRSA “outbreaks” as an indicator of when to screen is a valid approach which will limit MRSA transmission or infections. We have the following concerns.

- The absence of an outbreak does not mean absence of transmission.
- The definition of an outbreak is up to the facility and all too often a persistent rate of infections is accepted as a baseline and then the definition of an “outbreak” is not met.
- In the case of resistant bacteria, we feel one infection should be an outbreak, negating the need for use of this term in the formulation of MDRO control policy.

We also feel that MRSA is endemic in the community. The CDC’s own website estimates the rate of carriage of MRSA in the general population to equal 2% (“Two in 100 people carry MRSA”).¹⁶ Healthcare workers are at higher risk of exposure and contracting MRSA.¹⁷ Thus, their rate of carriage would be expected to be higher. Multiple studies from the United States and Europe have found the rate of MRSA carriage in healthcare workers to be approximately 5%.

“In 127 investigations, the average MRSA carriage rate among 33 318 screened health-care workers was 4.6%” “MRSA carriage of health-care workers was lower during outbreaks (3-9%) compared with endemic settings (8-1%), although heterogeneity between studies prevented direct comparisons.”¹⁸

Other recent studies have also reported high rates of healthcare worker MRSA carriage (4.3% to 15%).^{19,20} Albrich and Harbarth³ also observed that MRSA was able to be eradicated in 88% of 510 healthcare workers.

Unlike the general population, healthcare workers are in frequent contact with patients with fresh surgical wounds and in immunocompromised states. This makes control of MRSA carriage in this population of greater concern. At least one study has found a significant decrease in MRSA associated with screening and decolonization of healthcare workers.

“Identifying and treating colonized HCWs was followed by a significant reduction in the incidence of MRSA. Unrecognized MRSA-colonized HCWs may be an important reservoir in endemic institutions that could impair other control measures.”²¹

The cost of periodic screening healthcare workers for MRSA is minimal, since cultures can be performed and not require rapid testing. The cost is comparable to Flu Vaccines and Tb Tests which are also performed on a yearly basis. And the testing is much less expensive than drug testing.

¹⁶ General Information About MRSA in the Community. Centers for Disease Control and Prevention. Accessed from <https://www.cdc.gov/mrsa/community/index.html>

¹⁷ Chambers HF. The Changing Epidemiology of Staphylococcus aureus? Emerging Infectious Disease. Centers for Disease Control and Prevention. 7(2) 2001 Accessed from https://www.cdc.gov/eid/article/7/2/70-0178_article

¹⁸ Albrich, W. C., and Harbarth, S. (2008). Health-care workers: source, vector, or victim of MRSA? *Lancet Infect. Dis.* 8, 289–301. doi:10.1016/S1473-3099(08)70097-5

¹⁹ Bisaga A, Paquette K, Sabatini L, Lovell EO. A prevalence study of methicillin-resistant Staphylococcus aureus colonization in emergency department health care workers. *Ann Emerg Med.* 2008 Nov;52(5):525-8. doi: 10.1016/j.annemergmed.2008.03.019. Epub 2008 Apr 24.

²⁰ Suffoletto BP, Cannon EH, Ilkhanipour K, Yealy DM. Prevalence of Staphylococcus aureus nasal colonization in emergency department personnel. *Ann Emerg Med.* 2008 Nov;52(5):529-33. doi: 10.1016/j.annemergmed.2008.03.020. Epub 2008 Apr 24

²¹ Ben-David D, Mermel LA, Parenteau S. Methicillin-resistant Staphylococcus aureus transmission: the possible importance of unrecognized health care worker carriage. *Am J Infect Control.* 2008 Mar;36(2):93-7. doi: 10.1016/j.ajic.2007.05.013

The United States needs to take a leadership role in the control of MDROs and we feel this policy will support this goal by promoting the safety of both hospital staff and patients.

Thank you for this consideration,

Kevin T. Kavanagh, MD, MS
Health Watch USA
Somerset, KY

Kathy Day, RN
Patient Safety Advocate
Health Watch USA
Bangor, ME

Carole and Ty Moss
Nile's Project MRSA
Perris, CA

cc: L. Clifford McDonald, MD. Senior Advisor for Science and Integrity, Division of Healthcare Quality Promotion. Centers For Disease Control and Prevention; HICPAC Committee Management.

Discussion Points

ACOEM pointed out that interventions that make sense in a low-prevalence environment such as the Netherlands do not necessarily make sense in an environment where MRSA is common. Many years ago, a study showed that 46% of nurses who were working with patients with MRSA were colonized at the end of their shift, but none were colonized by the beginning of their next shift. A more recent study shows an approximate 15% MRSA transmission rate to the hands of healthcare personnel when they remove their gloves after working with MRSA patients. Transient carriage is an important phenomenon in a high-prevalence environment and is probably more important as a vector than ongoing colonization of healthcare personnel. The Public Comment referred to yearly screening; the challenge with implementing screening practices in healthcare personnel is that the “snapshot” cannot adequately differentiate between the frequent transient carriage that occurs in healthcare personnel versus longer-standing colonization.

Screening is addressed in one of the key questions in the *S. aureus* section of the Healthcare Personnel Guideline. The Workgroup will discuss it thoroughly.

Summary and Work Plan

Dr. Diekema thanked HICPAC members, *ex officio* members, and liaison representatives for their hard work and contributions to this productive meeting, as well as all of the work that is being done now between meetings. There is a very full agenda for the work plan going forward, including continuation of the work on the NICU and Healthcare Personnel guidelines; ongoing work and ambitious plans for the NHSN Workgroup; continuation of the work on the new recommendation categorization scheme; and continuation of the work being done by the Products and Practices Workgroup.

Adjourn

With no additional comments or questions posed, the meeting was adjourned at 11:38 am.

Certification

I hereby certify that, to the best of my knowledge and ability, the foregoing minutes of the November 8-9, 2017, meeting of the Healthcare Infection Control Practices Advisory Committee, CDC are accurate and complete.

Date

Daniel Diekema, MD, MS
Co-Chair, Healthcare Infection Control Practices
Advisory Committee, CDC

Date

Deborah Yokoe, MD, MPH
Co-Chair, Healthcare Infection Control Practices
Advisory Committee, CDC

Attachment #1: Acronyms Used In This Document

Acronym	Expansion
ACIP	Advisory Committee on Immunization Practices
ACOEM	American College of Occupational and Environmental Medicine
AEH	America's Essential Hospitals
AHA®	American Hospital Association®
AHRQ	Agency for Healthcare Research and Quality
AJIC	<i>American Journal of Infection Control</i>
AMMI Canada	Association of Medical Microbiology and Infectious Disease Canada
AORN	Association of periOperative Registered Nurses
APIC	Association of Professionals of Infection Control and Epidemiology
AR	Antibiotic Resistance
ARSTF	Antimicrobial Resistance Surveillance Task Force
ASRIFs	Antibiotic Stewardship and Resistance Innovative Fellowships
ASTHO	Association of State and Territorial Health Officials
AUR	Antimicrobial Use and Resistance Module
BAA	Broad Agency Announcement
BiPaP	Bilevel Positive Airway Pressure
<i>C. auris</i>	<i>Candida auris</i>
<i>C. difficile</i>	<i>Clostridium difficile</i>
CARB	Combating Antibiotic-Resistant Bacteria
CAUTI	Catheter-Associated Urinary Tract Infection
CDC	Centers for Disease Control and Prevention
CDI	<i>Clostridium difficile</i> Infection
CDPH	California Department of Public Health
CFO	Chief Financial Officer
CLABSI	Central Line-Associated Bloodstream Infection
CLSI	Clinical and Laboratory Standards Institute
CMS	Centers for Medicare and Medicaid Services
CORHA	Council for Outbreak Response: Healthcare-Associated Infections and Antibiotic-Resistant Pathogens
CP-CRE	Carbapenemase-Producing Carbapenem-Resistant <i>Enterobacteriaceae</i>
CRE	Carbapenem-Resistant <i>Enterobacteriaceae</i>
CRPA	Carbapenem-Resistant <i>Pseudomonas Aeruginosa</i>
CSTE	Council of State and Territorial Epidemiologists
CTFPHC	Canadian Task Force on Preventive Health Care
CU	Consumers Union
CUSP	Comprehensive Unit-based Safety Program
DAPS	Data Analysis and Presentation Standardization Toolkit
DFO	Designated Federal Official
DGMQ	Division of Global Migration and Quarantine
DHQP	Division of Healthcare Quality Promotion
DOH-Orange	Florida Department of Health-Orange County
DOT	Department of Transportation
DRG	Diagnosis-Related Group
ECDC	European Centre for Disease Prevention and Control
EIP	Emerging Infections Program

Acronym	Expansion
EPA	Environmental Health Protection Agency
FDA	(United States) Food and Drug Administration
FORHP	Federal Office of Rural Health Policy
FY	Fiscal Year
GI	Gastrointestinal
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
HIV	Human Immunodeficiency Virus
HMO	Health Maintenance Organization
HRET	Health Research & Educational Trust
HRSA	Health Resources and Services Administration
HTA	Health Technology Assessment
ICHE	Infection Control and Hospital Epidemiology
ICU	Intensive Care Unit
IDSA	Infectious Diseases Society of America
ISTW	Integrated Surveyor Training Website
IT	Information Technology
JAMA	<i>Journal of the American Medical Association</i>
KPC	<i>Klebsiella Pneumoniae</i> Carbapenemase
LabID	Laboratory-Identified Event Reporting
LTACH	Long-Term Acute Care Hospital
LTC	Long-Term Care
LTCF	Long-Term Care Facility
<i>M. chimaera</i>	<i>Mycobacterium chimaera</i>
MDGs	Millennium Development Goals
MDRO	Multidrug-Resistant Organism
MedPAC	Medicare Payment Advisory Commission
MERS-CoV	Middle East Respiratory Syndrome Coronavirus
MIND-Healthcare	Modeling Infectious Diseases in Healthcare
MIPS	(CMS) Merit-Based Incentive Payment System
MLN®	Medicare Learning Network®
MMR	Measles, Mumps, Rubella
MRSA	Methicillin-Resistant <i>Staphylococcus aureus</i>
MSSA	Methicillin-Susceptible <i>Staphylococcus aureus</i>
NACCHO	National Association of County and City Health Officials
NCEZID	National Center for Emerging and Zoonotic Infectious Diseases
NETEC	National Ebola Training and Education Center
NHSN	National Healthcare Safety Network
NICU	Neonatal Intensive Care Unit
NIH	National Institutes of Health
NPV	Negative Predictive Value
NQF	National Quality Forum
ORTP	(SHAE) Outbreak Response Training Program
OSHA	Occupational Safety and Health Administration

Acronym	Expansion
PACCARB	Presidential Advisory Council on Combating Antibiotic Resistant Bacteria
PCR	Polymerase Chain Reaction
PEP	Post-Exposure Prophylaxis
PHAC	Public Health Agency of Canada
PIDS	Pediatric Infectious Disease Society
PJI	Prosthetic Joint Infection
PMA	Premarket Approval
PPE	Personal Protective Equipment
PPV	Positive Predictive Value
QALY	Quality Adjusted Life Year
QIN-QIOs	(CMS) Quality Innovation Network and Quality Improvement Organizations
RCT	Randomized Controlled Trial
ROCI	Return on Community Investment
ROI	Return On Investment
RoP	Requirements of Participation
RSV	Respiratory Syncytial Virus
RT-PCR	Real-Time Polymerase Chain Reaction
<i>S. Aureus</i>	<i>Staphylococcus Aureus</i>
SARS	Severe Acute Respiratory Syndrome
SCCM	Society of Critical Care Medicine
SENIC	Study on the Efficacy of Nosocomial Infection Control Project
SHEA	Society for Healthcare Epidemiology of America
SHM	Society of Hospital Medicine
SIS	Surgical Infection Society
SME	Subject Matter Expert
SSI	Surgical Site Infection
TB	Tuberculosis
TJC	The Joint Commission
UK	United Kingdom
UN	United Nations
US	United States
UTI	Urinary Tract Infection
UV	Ultraviolet
VA	(United States Department of) Veterans Affairs
VSL	Value of Statistical Life
VSLY	Value of Statistical Life Year
WGS	Whole Genome Sequencing
WHO	World Health Organization

Attachment #2: Liaison Representative and ex officio Member Reports

Liaison Representative Report HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC) Centers for Disease Control and Prevention

Meeting Date: November 8-9, 2017

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

Liaison Representative name: Mark Russi, MD, MPH

Organization represented: **American College of Occupational and Environmental Medicine**

Interim activities and updates:

- ACOEM has issued several position statements and guidance documents during 2017. In addition, public commentary has been made on a number of issues, including maintaining NIOSH funding, OSHA Voluntary Protection Programs, and EPA National Ambient Air Quality Standards.

Guidelines and Guidance:

Please include products that are in progress and planned for the coming year. Include Web links if appropriate.

- Guidance for Occupational Health Services in Medical Centers 4/19/2017
- Global Trends in Occupational Medicine 3/15/2017

Position Statements:

- Interaction of Health Care Worker Health and Patient Health and Safety in the US Health Care System: Recommendations From the 2016 Summit 8/29/2017
- The Personal Physician's Role in Helping Patients with Medical Conditions Stay at Work or Return to Work 6/12/17
- Advancing Value-Based Medicine: Why Integrating Functional Outcomes with Clinical Measures is Critical to our Health Care Future 4/14/2017

Legislation:

- ACOEM responded to proposed revisions to Medicare Physician Fee Schedule. 9/18/2017
- ACOEM commented on future direction of OSHA Voluntary Protection Programs. 9/11/2017
- ACOEM objected to proposed changes to EPA National Ambient Air Quality Standard. 9/7/2017
- ACOEM commented on OSHA proposal to revoke ancillary provisions of Beryllium Rule for Construction and Shipyards. 8/29/2017
- ACOEM issued statements urging Congress to maintain NIOSH funding, and supporting a proposed OSHA Standard addressing workplace violence. 4/26/2017

Campaigns and related activities:

- None reported.

Press activities:

- 'Khamisiyah Plume' Linked to Brain and Memory Effects in Gulf War Vets 10/11/2017
- Occupational Health and the Arts -- Special Report in JOEM 9/21/2017
- ACOEM Urges OSHA Not to Revoke Ancillary Provisions of Beryllium Rule 9/1/2017
- ACOEM Disappointed DOT Has Withdrawn Proposed Rule to Screen Safety-Sensitive Personnel for Obstructive Sleep Apnea 8/21/2017
- Test May Help Identify Veterans with Deployment-Related Lung Disease 8/17/2017
- CDC Program Helps Smaller Companies Invest in Employee Health 7/14/2017 High Risk of Obstructive Sleep Apnea in Commercial Drivers 6/19/2017
- William C. Bruce Named Executive Director of the American College of Occupational and Environmental Medicine 6/8/2017
- Dr. Catherine Baase Receives Highest Honor in Occupational and Environmental Medicine 5/17/2017
- Traffic-Related Air Pollution Linked to DNA Damage in Children 5/11/2017
- What's Your Company Policy on E-Cigarettes? 4/13/2017
- Surveys Provide Employers' and Employees' Views on Wellness Programs 3/30/2017
- Supportive Leadership Linked to Lower Absenteeism/Presenteeism 2/22/2017
- Data-Driven Approach May Reduce Violence to Hospital Workers 1/17/2017

Publications:

- As above

Other items of note:

- None reported.

**Liaison Representative Report
HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)
Centers for Disease Control and Prevention**

Meeting Date: Nov. 8-9, 2017

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

Liaison Representative name: Maryellen Guinan, JD

Organization represented: **America's Essential Hospitals**

Interim activities and updates:

- None reported.

Guidelines and Guidance:

- None reported.

Position Statements:

- None reported.

Legislation:

- None reported.

Campaigns and related activities:

- America's Essential Hospitals continues to be a partner organization in the U.S. Stakeholder Forum on Antimicrobial Resistance (S-FAR), convened by the Infectious Diseases Society of America (ISDA), to support the principles that antimicrobial resistance (AR) is an urgent problem and to work with stakeholders from all industries to help inform policy and create awareness.

Press activities:

- **Get Ahead of Sepsis** – As part of Sepsis Awareness Month, in September, America's Essential Hospitals delivered messaging to encourage health care professionals, patients, and caregivers to recognize the signs of sepsis and act quickly when an infection is detected. This included staff participation in a Twitter chat hosted by CDC.
- **International Infection Prevention Week (Oct. 15-21)** – America's Essential Hospitals' staff participated in the Twitter chat hosted by CDC and Association for Professionals in Infection Control and Epidemiology (APIC). The conversation was robust and provided participants with information about antibiotic resistance and preservation.
- Pushed information to members about CDC/Medscape continuing education program on injection safety—video series designed to help health care professionals understand proper infection control procedures and how to use them.
- Staff from members of America's Essential Hospitals—MetroHealth in Cleveland, OH and Oregon Health and Science University—were featured speakers for two online

training modules, launched by the Society for Healthcare Epidemiology of America (SHEA) and CDC Outbreak Response Training Program, to improve decision making during outbreaks.

- America's Essential Hospitals actively promotes CDC information to our members via social media on timely topics such as antibiotic stewardship and opioid prescribing as well as continuing education opportunities such as recognizing infection risks in medical equipment. For this information and more, you can follow us on Twitter at @OurHospitals and on Facebook at www.facebook.com/essentialhospitals.

Publications:

- **Zika** – America's Essential Hospitals continues to maintain its [online Zika resource page \(http://essentialhospitals.org/policy/zika-resources-for-essential-hospitals/\)](http://essentialhospitals.org/policy/zika-resources-for-essential-hospitals/) for its member hospitals and others with an interest in this emerging health crisis. This resource page is updated regularly with new information, including materials provided by the CDC related to clinicians, infants, pregnant women, and travel. Essential hospitals provide a significant volume of public health and emergency preparedness services and stand ready to support the nation's response to Zika.

Other items of note:

- Five members of America's Essential hospitals were among those awarded funding from CDC to fight antibiotic resistance. Grant recipients will use this funding to develop and assess strategies to protect patients from resistance threats.

Ex Officio Report
HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)
Centers for Disease Control and Prevention

Meeting Date: November 8-9, 2017

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

Ex officio member name: Melissa A. Miller, MD, MS

Agency represented: **Agency for Healthcare Research and Quality**

Interim activities and updates:

- National Action Plan for Combating Antibiotic-Resistant Bacteria (CARB)

AHRQ continues to support research and implementation projects to develop improved methods and tools to combat antibiotic resistance in all three domains:

1. Promoting antibiotic stewardship
2. Preventing transmission of resistant bacteria; and
3. Preventing healthcare-associated infections (HAIs) in the first place.

These projects are combating antibiotic resistance in multiple healthcare settings: acute care hospitals, long-term care, and ambulatory care.

AHRQ has reviewed the first three rounds of applications responding to 2 new CARB-specific FOAs for R01 and R18 applications, in addition to our renewed HAI prevention FOAs. The CARB FOAs have stimulated research grant applications in all 3 CARB domains.

On September 13-14, 2017, AHRQ presented updates on its antibiotic stewardship and HAI prevention activities to the public meeting of the Presidential Advisory Council on CARB.

- AHRQ Safety Program for Improving Antibiotic Use

The AHRQ Safety Program for Improving Antibiotic Use is funded and guided by AHRQ, and led by Johns Hopkins University and NORC at the University of Chicago. This is a 5-year nationwide project aimed at adapting the Comprehensive Unit-based Safety Program (CUSP) for implementation of Antibiotic Stewardship in at least 250 acute care hospitals, 250 long-term care facilities, and 250 ambulatory care settings (i.e., clinics, physician's offices, and urgent care centers). We anticipate that the project will significantly increase antibiotic stewardship in these settings. This is a collaborative effort that incorporates CDC Core Elements of Antibiotic Stewardship and involves coordination with CDC and CMS and likely participation by DoD. An evidence review has been completed, and a pilot period is ongoing, with activities being coordinated in 3 integrated delivery systems that encompass all 3 healthcare settings. Recruitment will close November 17 for an acute care hospital cohort beginning in December 2017. Long-term care and ambulatory cohorts will follow in December 2018 and December 2019 respectively.

- AHRQ Safety Program for Improving Surgical Care and Recovery

The AHRQ Safety Program for Improving Surgical Care and Recovery, a collaborative program to enhance the recovery of surgical patients, is a program funded and launched by AHRQ that is being conducted by Johns Hopkins University with partners including the American College of Surgeons. The program aims to use an adaptation of CUSP to improve patient outcomes by increasing the implementation of evidence-based enhanced recovery practices in hospitals. Enhanced recovery pathways include preoperative, intra-operative, and postoperative practices

that can decrease complications, including surgical site infections, and accelerate recovery. This 5-year project aims for implementation in 750 hospitals nationwide, addressing a variety of surgeries in a phased approach. More than 140 hospitals are participating in the first cohort which focuses on colorectal surgery. Preparations are underway for expansion to orthopedic surgery in the next cohort which will begin in early 2018.

- **AHRQ Safety Program for Intensive Care Units: Preventing CLABSI and CAUTI**
Initiated in September 2015, this project aims to reduce central-line associated bloodstream infections (CLABSI) and catheter-associated urinary tract infections (CAUTI) in intensive care units with persistently elevated rates of these infections. This is a follow-up to AHRQ's nationwide projects of CUSP for CAUTI and CUSP for CLABSI. Implementation strategies tailored to this group continue to be developed, including a modified set of CUSP training resources. Thus far, over 300 ICUs have been recruited to participate from 4 Health and Human Services Regions. A task order contract to expand this project to nationwide coverage was awarded September 29, 2017 to Health Research & Educational Trust. The expansion phase will involve 450-600 additional ICUs.

Publications:

Selected AHRQ-funded publications:

- Cocoros, N. M., Priebe, G., Gray, J. E., et al. (2017). Factors Associated With Pediatric Ventilator-Associated Conditions in Six U.S. Hospitals: A Nested Case-Control Study. *Pediatr Crit Care Med*. PMID: 28914722
- Jackson, S. S., Leekha, S., Magder, et al. (2017). The Effect of Adding Comorbidities to Current Centers for Disease Control and Prevention Central-Line-Associated Bloodstream Infection Risk-Adjustment Methodology. *Infect Control Hosp Epidemiol*, 38(9), 1019-1024. PMID: 28669363
- Krein, S. L., Harrod, M., Collier, S., et al. (2017). A national collaborative approach to reduce catheter-associated urinary tract infections in nursing homes: A qualitative assessment. *Am J Infect Control*. PMID: 28807424
- Pierce, R., Bryant, K., Elward, A., et al. (2017). Bacterial Infections in Neonates Following Mupirocin-Based MRSA Decolonization: A Multicenter Cohort Study. *Infect Control Hosp Epidemiol*, 38(8), 930-936. PMID: 28578731
- Rhee, C., Dantes, R., Epstein, L., et al. (2017). Incidence and Trends of Sepsis in US Hospitals Using Clinical vs Claims Data, 2009-2014. *JAMA*, 318(13), 1241-1249. PMID: 28903154
- Saiman, L., Maykowski, P., Murray, M., et al. (2017). Incidence, Risks, and Types of Infections in Pediatric Long-term Care Facilities. *JAMA Pediatr*, 171(9), 872-878. PMID: 28738121

**Liaison Representative Report
HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)
Centers for Disease Control and Prevention**

Meeting Date: Nov 8-9, 2017

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

Liaison Representative name: Sharon A. Morgan, MSN, RN, NP-C

Organization represented: **American Nurses Association (ANA)**

Interim activities and updates:

- Continued execution of CDC contract, NICE Network:
 - 3 separate webinars—The role of device reprocessing & environmental services in infection prevention and control; infection prevention across the care continuum.
 - 10 separate organizational affiliates or state nursing associations participated thus far
 - 6 Specialty Organization Conference presentations tailoring infection prevention & control practices to specialty area
- Multiple briefings to national level bodies on ANA/CDC White Paper *Nurses' Role in Antibiotic Stewardship* (CMS, Pews Trust, ie)

Guidelines and Guidance:

Please include products that are in progress and planned for the coming year. Include Web links if appropriate.

- None reported

Position Statements:

- [Nurses Role in Antibiotic Stewardship](http://www.nursingworld.org/DocumentVault/NursingPractice/WhitePapers/ANA-CDC-AntibioticStewardship-WhitePaper.pdf)
(<http://www.nursingworld.org/DocumentVault/NursingPractice/WhitePapers/ANA-CDC-AntibioticStewardship-WhitePaper.pdf>)

Legislation:

- None reported

Campaigns and related activities:

- None reported

Press activities:

- None reported

Publications:

- None reported

Other items of note:

- None reported

Liaison Representative Report
HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)
Centers for Disease Control and Prevention

Meeting Date: November 8-9, 2017

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

Liaison Representative name: Amber Wood

Organization represented: **Association of periOperative Registered Nurses (AORN)**

Interim activities and updates:

- AORN Global Surgical Conference & Expo 2018, March 24-28, New Orleans, LA
- Prep for CNOR Live Events, July-November 2017, 13 locations
- Guideline Implementation Workshops, September-November 2017, 12 locations

Guidelines and Guidance:

- AORN guidelines are available in print and through electronic access. Information on how to obtain the guidelines can be found at the [AORN website \(www.aorn.org\)](http://www.aorn.org).
- Guidelines are posted for a 30-day public comment period at the [AORN website \(https://www.aorn.org/events/public-comments\)](https://www.aorn.org/events/public-comments).
- The 2017 *Guidelines for Perioperative Practice* include 5 new evidence-rated guidelines: Information Management, Hand Hygiene, Energy Devices, Surgical Smoke Safety, & Minimally Invasive Surgery
- Guidelines in development for 2018 print publication
 - Positioning: published electronically
 - Medication Safety: published electronically
 - Prevention of Venous Thromboembolism: electronic release 11/1/17
 - Medical Device and Product Evaluation: electronic release 11/1/17
 - Team Communication: electronic release 1/15/17
 - High Level Disinfection: electronic release 1/15/17
- ***Launching a new electronic subscription platform in 2018!***
- Guidelines in development for 2019 print publication
 - Safe Patient Handling and Management: public comment February 2018
 - Safe Environment of Care, Part 2 (Design & Construction): public comment March/April 2018
 - Sterilization: public comment April/May 2018
 - Safe Environment of Care, Part 1: public comment May/June 2018
 - Sterile Technique: public comment July 2018
 - Transmissible Infections: public comment August 2018

Position Statements:

- Available at the [AORN website \(http://www.aorn.org/guidelines/clinical-resources/position-statements\)](http://www.aorn.org/guidelines/clinical-resources/position-statements)

Legislation:

- AORN legislative priorities for 2017 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:

- Nursing Infection Control Education (NICE) network participants
- Surgical Smoke Safety. Go Clear Award recognizes health care facilities committed to a surgical smoke-free environment for their perioperative team and patients and is described at the [AORN website](http://www.aorn.org/aorn-org/education/facility-solutions/aorn-awards/aorn-go-clear-award) (<http://www.aorn.org/aorn-org/education/facility-solutions/aorn-awards/aorn-go-clear-award>).

Press activities:

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

Publications:

- *2017 Guidelines for Perioperative Practice*, AORN Journal, Perioperative Job Descriptions and Competency Evaluation, Perioperative Policies and Procedures, & Ambulatory Surgery Center Resources

Other items of note: n/a

Liaison Representative Report
HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)
Centers for Disease Control and Prevention

Meeting Date: November 8-9, 2017

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

Liaison Representative: Darlene Carey MSN, RN, CIC, NE-BC, FAPIC

Organization represented: **Association for Professionals in Infection Control and Epidemiology Inc. (APIC)**

Interim activities and updates:

- APIC education department conducted first ASC Intensive course in August and continue additional 3 pilots.

Guidelines and Guidance:

Please include products that are in progress and planned for the coming year. Include Web links if appropriate.

- N/A

Position Statements:

- N/A

Legislation:

- Submitted comments to CMS on the CY 2018 Hospital Outpatient Prospective Payment and Ambulatory Surgical Center Payment Systems (OPPS/ASC) [proposed rule](http://www.apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/OPPS_CY_2018_comments_--_Final_9-11-17.pdf). (http://www.apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/OPPS_CY_2018_comments_--_Final_9-11-17.pdf)
- Submitted comments to CMS on the CY 2018 End-Stage Renal Disease Prospective Payment System annual update [proposed rule](http://www.apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/ESRD_PPS_CY_2018_comments_--_final_8-28-17.pdf). (http://www.apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/ESRD_PPS_CY_2018_comments_--_final_8-28-17.pdf)
- Provided input to CDC on request for information on effective methods for achieving implementation of [water management programs \(WMPs\)](http://www.apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/Advocacy_Updates/RFI_on_WMPs_--_final_10-11-17.pdf) (http://www.apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/Advocacy_Updates/RFI_on_WMPs_--_final_10-11-17.pdf) and requested that our members individually provide input on behalf of their own facilities.

Campaigns and related activities:

- Celebrated International Infection Prevention Week, October 15-21. Activities focused on the issue of antibiotic resistance. Highlights:
 - New [ABC's of prescribing antibiotics](http://professionals.site.apic.org/files/2017/09/ABCs-of-Antibiotics_forHCWs_final-hiq.pdf) (http://professionals.site.apic.org/files/2017/09/ABCs-of-Antibiotics_forHCWs_final-hiq.pdf) infographic for healthcare professionals
 - Redesign of *Infection Prevention and You* [website](http://professionals.site.apic.org/) (<http://professionals.site.apic.org/>) with new e-cards, quizzes, graphics
 - 2 promotional toolkits – to allow members and partner groups spread infection

- prevention messages through their communications channels
- Twitter chat with CDC and other partners to discuss antibiotic resistance and actions patients, professionals, and others can take to reduce this threat. The chat hashtag (#IIPWChat) received 1,658 mentions from 819 engaged users.
- Social media “Thunderclap” in which 240 people/organizations participated, reaching an estimated 392,846 people on social media.
- Revision of [APIC Public Policy website \(http://cqrccengage.com/apic/home\)](http://cqrccengage.com/apic/home) and release of advocacy [“Speaking with one Voice” video \(https://www.youtube.com/watch?v=R4MPBEZdBZA\)](https://www.youtube.com/watch?v=R4MPBEZdBZA)

Press activities:

- Issued press releases to promote studies in the *American Journal of Infection Control*:
 - Failures in stethoscope hygiene can lead to patient infections
 - Empowering patients effectively improves physician hand hygiene
 - Nursing home workers often fail to change gloves, risking spread of infection
 - Sepsis care initiatives may lead to higher *C. difficile* infection rates, antibiotic resistance
 - Survey Findings: 4 in 10 Healthcare Professionals Work While Sick

Publications:

- *Prevention Strategist* fall issue included articles on CDC’s new SSI guide, The APIC Program of Distinction (cover stories); Educating student nurses on PPE; *Neisseria gonorrhoeae*; Ratios, proportions, and rates; Scabies; IIPW; The use of CHG for patient bathing and the discontinuation of contact precautions for patients with *C. difficile*; Endoscope reprocessing case study: UCSF Medical Center; Educational isolation rounds; An IP’s journey to discover causes for colored urine.

Other items of note:

APIC invited to participate in an AAMI Stakeholder event on sterilization of endoscopes this past September. Representatives from healthcare associations, FDA, manufacturers, academia, independent researchers as well as patient and clinician groups discussed the potential changes to the Spaulding Classification for Endoscopes to critical versus semi-critical.

Liaison Representative Report
HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)
Centers for Disease Control and Prevention

Meeting Date: November 8-9, 2017

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

Liaison Representative name: Emily Lutterloh, MD, MPH

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

Interim activities and updates

- ASTHO continues to build on HAI prevention efforts by providing support to state health agencies, promoting sound public health policies, and building strong partnerships. ASTHO is working in collaboration with the CDC to develop tools and collect best practices relating to the detection, investigation, control and prevention of state healthcare-associated infections. Some products of these collaborations include:
 - Co-leading the **Council for Outbreak Response: Healthcare-Associated Infection and Antibiotic Resistant Pathogens (CORHA)**, with the Council of State and Territorial Epidemiologists (CSTE), through which ASTHO continues to provide support to Council members and working groups to develop tools and products towards achieving its mission and vision. Later this fall CORHA will launch a website, which will house tools, resources, and information about the Council's membership. An all-member meeting is scheduled to take place on November 30-December 1, 2017 in Atlanta, GA.
 - Co-leading with CDC's Division of Healthcare Quality Promotion (DHQP), a project aimed at exploring the nature of states' healthcare-associated infection and antibiotic-resistant pathogen (HAI/AR) outbreak reporting policy(ies). This project, which builds upon the HAI/AR outbreak response capacities assessment that state health departments completed as part of the Domestic Ebola Supplement to Epidemiology and Laboratory Capacity for Infectious Diseases (ELC), will consist of a series of qualitative interviews with key informants in seven states. The information gathered from these interviews will be used to inform a report on how the existence, content, language, and structure of an HAI/AR outbreak reporting policy influences the reporting of HAI/AR outbreaks to public health. The results will also help inform the development of future guidance on HAI/AR outbreak response and investigation, as well as future ASTHO state HAI/AR policy initiatives.

Guidelines and Guidance:

Please include products that are in progress and planned for the coming year. Include Web links if appropriate.

- In collaboration with CDC, ASTHO launched the [Healthcare and Infection Control Gateway](http://www.astho.org/healthcare-and-infection-control/) (<http://www.astho.org/healthcare-and-infection-control/>), which aims to provide guidance to state health agencies on controlling and preventing HAIs.

Legislation:

- Ongoing: Real-time state infectious disease legislative tracking on [ASTHO's website](http://www.astho.org/state-legislative-tracking/#) (<http://www.astho.org/state-legislative-tracking/#>)

Campaigns and related activities:

- ASTHO showcased selected state success stories on HAI prevention and control as part of the organization's 75th Year Anniversary campaign.

Publications:

- ASTHO's [HAI Publications](http://www.astho.org/Programs/Infectious-Disease/Healthcare-Associated-Infections/) are available online (www.astho.org/Programs/Infectious-Disease/Healthcare-Associated-Infections/).

Ex Officio Report
HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)
Centers for Disease Control and Prevention

Meeting Date: November 8-9, 2017

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

Ex officio member name: Daniel Schwartz, MD

Agency represented: **Centers for Medicare and Medicaid Services (CMS)**

Interim activities and updates:

- Information for new CMS Legionella requirement:
 - [New CMS Legionella Requirement for Hospitals, Critical Access Hospitals, and Nursing Homes](https://www.cms.gov/Outreach-and-Education/Outreach/FFSProvPartProg/Provider-Partnership-Email-Archive-Items/2017-10-19-eNews.html#_Toc496095568) (https://www.cms.gov/Outreach-and-Education/Outreach/FFSProvPartProg/Provider-Partnership-Email-Archive-Items/2017-10-19-eNews.html#_Toc496095568)

Other items of note:

The new CMS surveyor Universal Infection Prevention and Control Course is now available to providers.

To access the University Infection Prevention and Control Course on the Integrated Surveyor Training Website (ISTW), the provider would click on the link to [Surveyor Training](https://surveyortraining.cms.hhs.gov) (<https://surveyortraining.cms.hhs.gov>). Once on the main home page, click on “I am a Provider”. Click on the Course Catalog link at the top of the page. In Search Courses, type “Universal Infection Prevention and Control”. Click on the course– then click “launch course” to begin.

OCMSSTATERAI Available On Demand	State RAI Coordinator Fundamentals Description: This course will provide an overview of the roles and responsibilities of a State RAI Coordinator as well as providing background information on the RAI process, including the MDS, CAAs, and care plan development.	Web-based
OCMSRAICAA_ONL Available On Demand	State RAI Coordinator Fundamentals Part 2: The Care Area Assessments (CAAs) Description: To be able to recognize and apply the principle that the goal of the CAA process is to facilitate the development of an interdisciplinary, resident specific, person centered care plan.	Web-based
OCMSAPSYMEDUNH_Survey Available On Demand	Surveying for Anti-Psychotic Medication Use in Nursing Homes Description: This program is an interactive self-study with video clips that walks through portions of an actual nursing home survey.	Web-based
OCMSIJPC_ONL Available On Demand	Universal Infection Prevention and Control Description: This course is designed to provide you with the basic knowledge and skills needed to prepare surveyors to evaluate practices and procedures used by health care facilities to prevent and control infections.	Web-based

CMS & HHS Websites
 Medicare.gov
 MyMedicare.gov
 StopMedicareFraud.gov
 Medicaid.gov
 InsureKidsNow.gov
 HealthCare.gov
 HHS.gov/Open

Tools
 Acronyms
 Contacts
 FAQs
 Glossary
 CMS.gov Archive
 Site Map

Helpful Links
 Web Policies & Important Links
 Privacy Policy
 Freedom of Information Act
 No Fear Act
 HHS.gov
 Inspector General
 USA.gov

 Centers for Medicare & Medicaid Services
 7500 Security Boulevard, Baltimore, MD 21244

For information about the availability of auxiliary aids and services, please visit:
<http://www.medicare.gov/about-us/nondiscrimination/nondiscrimination-notice.html>

Liaison Representative Report
HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)
Centers for Disease Control and Prevention

Meeting Date: Nov 8-9, 2017

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

Liaison Representative Name: Marion Kainer

Organization represented: **Council of State and Territorial Epidemiologists (CSTE)**

Interim activities and updates:

- **CSTE annual conference** will be held June 10-14 in West Palm Beach, Florida. Abstracts close 1/3/2018
- **CP-CRE:** Discussions underway on operationalizing reporting and national notification of CP-CRE (effective date: Jan 1, 2018)

Guidelines and Guidance:

Please include products that are in progress and planned for the coming year. Include Web links if appropriate.

- **The Council for Outbreak Response: Healthcare Associated Infections and Antibiotic Resistant Pathogens (CORHA)** will meet in person in Nov/Dec 2017. A one-pager describing the mission, vision, membership can be found at the CORHA website (<http://corha.org/>)
 - The Council is co-chaired by CSTE and ASTHO; CDC, NACHO. APIC and SHEA are members of the Council. FDA and CMS liaisons participated in the in person meeting in May 2017. Two workgroups have formed and have work-plans. Several work products are being finalized and will be posted on the CORHA website within the next few months
 - CORHA Workgroup A (Outbreak Detection and Reporting) will:
 - 1) create standard definitions for outbreaks and exposure events and thresholds for reporting;
 - 2) improve reporting of outbreaks and exposure events to public health;
 - 3) improve the use of existing surveillance systems to detect outbreaks.
 - CORHA Workgroup B (Outbreak investigation and control) will work on
 - 1) defining appropriate levels of response;
 - 2) improve response to investigation and control of outbreaks to public health;
 - 3) improve data management for outbreak investigation and tracking
- **Antimicrobial Resistance Surveillance Taskforce (ARSTF):**
 - The Antimicrobial Resistance Surveillance Task Force (ARSTF) is a collaboration of the CDC, the Association of Public Health Laboratories (APHL), and CSTE. It consists of thirty-plus individuals from clinical care, public health, laboratories, and informatics. It began in 2016, and after a full year of work, developed a vision statement, strategic map and profile, and a schema of roles and responsibilities for various levels of public health agencies for the next three years, with specific objectives for this year. The objectives address infrastructure building, collaborative

alignments, and several specific initiatives (such as ensuring that antimicrobial susceptibility data do not get suppressed for public health purposes).

- Guided by the strategic map and profile, the Task Force has developed 3 major working groups for the next steps of planning, collaboration, and actions to achieve its strategic objectives. The strategic profile, other key documents which lay out the work of the Task Force to date, and over the next three years, are available on the [CSTE website \(https://cste.site-ym.com/page/ARS\)](https://cste.site-ym.com/page/ARS)
- The Task Force wants to align and keep in communication with other planning bodies, such as HICPAC. There are various ways interested organizations and individuals could keep informed about the work of the Task Force: the Task Force email list, the Task Force's newsletter, or by checking the CSTE website. Individuals could also participate on one of the Task Force's working groups. For more information, contact Monica Huang at mhuang@cste.org or Richard Melchreit at ramrd@comcast.net
- **Drug Diversion toolkit**
 - The Drug Diversion workgroup is developing a toolkit to provide guidance for state and local HAI programs during response to drug diversion events.
- **Data analysis and Presentation Standards (DAPS) toolkit**
 - Work underway to update/ expand the DAPS toolkit. Current toolkit available [online \(http://www.cste.org/general/custom.asp?page=HAIToolkit\)](http://www.cste.org/general/custom.asp?page=HAIToolkit). Topics include presentation of dialysis data, NHSN AU/ AR data; consumer-friendly language around the re-baselining, guidance on trending (especially with re-baselining)

Publications (available [online \(http://www.cste.org/?page=cstepublications\)](http://www.cste.org/?page=cstepublications))

- Novel Influenza Planning Toolkit: Templates, Resources, Guidance for State and Local Public Health Jurisdictions
- Best practices for surveillance of antimicrobial resistance via electronic laboratory reporting
- Operational guidance for Position Statement 17-ID-07: Standardized Case Definition for Extrapulmonary Nontuberculous Mycobacteria Infections
- Operational Guidance for PS 17-ID-04: Public Health Reporting and National Notification of Carbapenemase Producing Carbapenem-Resistant Enterobacteriaceae (CP-CRE) for *E. coli*, *Klebsiella* spp and *Enterobacter* spp.

Other items of note:

- [CSTE Webinar library \(http://www.cste.org/?page=WebinarLibrary\)](http://www.cste.org/?page=WebinarLibrary)
 - Includes webinar series on topics such as “Program evaluation: The CDC way for epidemiologists” and Culture independent diagnostic test (CIDT) challenges.

Ex Officio Report
HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)
Centers for Disease Control and Prevention

Meeting Date: November 8-9, 2017

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

Ex officio member name: Yvonne Chow

Agency represented: **Health Resources and Services Administration (HRSA)**

Interim activities and updates:

- CDC and FORHP are doing a joint webinar on Successful Best Practices of Antibiotic Stewardship for Critical Access Hospitals on November 16, 2017 at 2PM as part of National Rural Health Day (Nov 16) and U.S. Antibiotic Awareness Week (Nov 13-19). Webinar will include a CAH Pharmacist working in New York and one in Colorado. [Registration](https://cc.readytalk.com/registration/#/?meeting=36lpo5lqjmp1&campaign=u2xxa0r3d2g1) is online (<https://cc.readytalk.com/registration/#/?meeting=36lpo5lqjmp1&campaign=u2xxa0r3d2g1>).

Guidelines and Guidance:

Please include products that are in progress and planned for the coming year. Include Web links if appropriate.

- N/A

Position Statements:

- N/A

Legislation:

- N/A

Campaigns and related activities:

- N/A

Press activities:

- N/A

Publications:

- (In progress): Commentary: Call to action - Collaborative Approaches to Antibiotic Stewardship in Small Community and Critical Access Hospitals.
 - FORHP will be a co-author

Other items of note:

- N/A

Liaison Representative Report
HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)
Centers for Disease Control and Prevention

Meeting Date: November 8-9, 2017

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

Liaison Representative name: Stephen Weber, MD

Organization represented: **Infectious Diseases Society of America (IDSA)**

Interim activities and updates:

- **IDSA Launches Antimicrobial Stewardship Centers of Excellence Program.** The program recognizes institutions that achieve standards established by the CDC for antimicrobial stewardship programs led by infectious diseases physicians and ID-trained pharmacists. The core criteria for the IDSA Antimicrobial Stewardship Centers of Excellence build upon the criteria detailed in the CDC's Core Elements of Hospital Antibiotic Stewardship Programs. The goals of the program are to not only recognize those who have achieved high standards in their stewardship programs, but also highlight the value of stewardship over our valuable but vulnerable drug supply. (11/2/17)
- **Fellowship in Stewardship and Resistance Receives CDC Funding.** IDSA, the Society for Healthcare Epidemiology of America and the Pediatric Infectious Diseases Society have been awarded a contract from the Centers for Disease Control and Prevention (CDC) to establish an Antibiotic Stewardship and Resistance Innovative Fellowships program to build and connect expertise in public health and healthcare.
- **IDSA, together with partner organizations, successfully convened IDWeek 2017 in San Diego, CA.** Held from October 4-8, IDWeek 2017 again embraced the theme: "Advancing Science, Improving Care" for thousands of attendees, presenters and exhibitors. (10/4/17)
- **Keynote at World AMR Congress.** IDSA then-President William Powderly, MD, FIDSA, joined the president of the American Society for Microbiology at the World AMR Congress in September for a joint keynote in which he highlighted IDSA's AMR policy and advocacy efforts and the leading role of ID physicians in implementing antimicrobial stewardship. (9/15/17)
- **IDSA comments to the Ad-hoc Interagency Coordination Group (ICG) on Antimicrobial Resistance** summarizing IDSA recommendations to implement the United Nations General Assembly Political Declaration and Global Action Plan (GAP) on AMR and highlighting opportunities for IDSA-ICG collaboration. (8/31/17)

Guidelines and Guidance:

- Diagnosis and Management of Infectious Diarrhea (Clin Infect Dis Oct 2017)
- Prevention of Healthcare-Associated Infections in Acute Care Hospitals (Update in Progress)
- *Clostridium difficile* (Update in Progress)
- Management of Catheter-Related Infections (Update in Progress)

- Vancomycin – (Update in Progress)
- Link to other guidelines on [IDSA website](http://www.idsociety.org/IDSA_Practice_Guidelines/) (http://www.idsociety.org/IDSA_Practice_Guidelines/)

Legislation:

- **Legislative activity.** IDSA has been particularly active in offering comments and feedback regarding legislative activity and proposals related to access to health care, drug development and other issues:
 - Graham Cassidy Bill (9/21/17)
 - Senate Appropriations action on the State and Foreign Operations and Labor, Health and Human Services FY 2018 funding bills (9/8/17)
 - House of Representatives State and Foreign Operations and Labor, Health and Human Services FY 2018 funding bills (7/13/17)
- **Advocacy** IDSA continues to aim to enhance awareness and activism among members regarding policies related to infectious diseases practice, infection prevention and antimicrobial resistance. At IDWeek2017, members were offered the opportunity to engage in multiple new activities including an advocacy lunch, exposure to IDSA advocacy staff and an advocacy training session. (10/4/17)

Campaigns and related activities:

- New antibiotic development ([10 x '20 initiative](http://www.idsociety.org/10x20/)) (<http://www.idsociety.org/10x20/>)
- [Antimicrobial resistance and stewardship](http://www.idsociety.org/AR_Policy/) (http://www.idsociety.org/AR_Policy/)
- [Infection prevention and control](http://www.idsociety.org/Infection_Control_Policy/) (http://www.idsociety.org/Infection_Control_Policy/)

Publications:

- Guh AY, Adkins SH, Li Q, et al. Risk Factors for Community-Associated Clostridium difficile Infection in Adults: A Case-Control Study. Open Forum Infectious Diseases, Volume 4, Issue 4, 1 October 2017
- Shane AL, Mody RK, Crump JA, et al. 2017 Infectious Diseases Society of America Clinical Practice Guidelines for the Diagnosis and Management of Infectious Diarrhea. Clin Infect Dis 2017 Oct (epub ahead of print)
- Barker AK, Alagoz O, Safdar N. Interventions to reduce the incidence of hospital-onset Clostridium difficile infection: An agent-based modeling approach to evaluate clinical effectiveness in adult acute care hospitals. Clin Infect Dis Nov (accepted manuscript)
- O'Leary EN, van Santen KL, Webb AK, Pollock DA, Edwards JR, Srinivasan A. Uptake of Antibiotic Stewardship Programs in US Acute Care Hospitals: Findings From the 2015 National Healthcare Safety Network Annual Hospital Survey. Clin Infect Dis. 2017 Oct 30;65(10):1748-1750.
- Kanamori H, Rutala WA, Weber DJ. The Role of Patient Care Items as a Fomite in Healthcare-Associated Outbreaks and Infection Prevention. Clin Infect Dis. 2017 Oct 15;65(8):1412-1419.

Liaison Representative Report
HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)
Centers for Disease Control and Prevention

Meeting Date: November 8-9, 2017

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

Liaison Representative name: Jacqueline Lawler, Orange County Health Department (NY)

Organization represented: **National Association of County and City Health Officials (NACCHO)**

Interim activities and updates:

- July 2017 – present: To foster and expand local health department (LHD) HAI activities and HAI prevention, NACCHO continues to work with three HAI demonstration sites. The current project year focuses on local health departments' antibiotic stewardship efforts and evaluation of the project impact; the three funded demonstration sites and their general activities are below.
 - The Florida Department of Health in Orange County – Orlando, FL is developing a report from their social network analysis using Medicaid data provided by the Centers for Disease Control and Prevention. DOH-Orange will also develop a toolkit to enable other local health departments to replicate the process. DOH-Orange will also conduct infection prevention trainings in long term care facilities, finalize a toolkit on asymptomatic bacteriuria, and create a Return on Investment toolkit based on findings from a local cost-based analysis for HAI events.
 - The DuPage County Health Department in Wheaton, IL is addressing handwashing and antimicrobial stewardship (AS) among the general public through an advertising campaign; engaging 2-3 long term care facilities to improve stewardship efforts and implementation of CDC Core Elements for Antimicrobial Stewardship; and continuing collaboration with the Illinois HAI program through local meetings and supporting the statewide Antimicrobial Stewardship Summit.
 - The Philadelphia Department of Public Health in Philadelphia, PA is sustaining a Philadelphia Antimicrobial Stewardship Collaborative to provide regional leadership and advocacy; establishing a LTCF listserv for AS and IP information dissemination, implementing a survey among long term care facilities to establish a baseline for AS practices; providing training opportunities for staff within the health department and healthcare facility partners specific to antimicrobial stewardship and/or infection prevention specifically associated with multi-drug resistant organisms; and collaborating with the Pennsylvania Department of Health HAI staff.
 - NACCHO will be conducting in-depth qualitative interviews with each demonstration site to evaluate the HAI and AMR work conducted at each demonstration site, as well as the impact of engaging with NACCHO and peer demonstration sites on their work.
- July 2017- present: NACCHO staff convene the ELC Directly Funded Cities quarterly to provide a platform for program staff and laboratories to share activity updates, lessons learned, and emerging issues.
- July 2017– present: In an effort to improve local infection control and preparedness and

response to Ebola and other infectious disease threats in healthcare and community settings, NACCHO will continue engagement with Lessons in INfection Control (LINC) Initiative demonstration sites.

- Developed in coordination with demonstration sites from NACCHO's LINC program, the [Healthcare-Associated Infections: A Toolkit for Local Health Departments](http://essentialelements.naccho.org/archives/7223) toolkit (<http://essentialelements.naccho.org/archives/7223>) which provides LHDs with guidance, best practices, tools, and resources for expanding activities related to improving local infection control, preparedness, and response.
- Developed a video featuring aspects of NACCHO LINC demonstration site activities which articulates the role of local health departments in HAI prevention and control. Public release is forthcoming.
- July 2017- present: In an effort to ensure that policies, activities and strategies are aligned with national, state and local partners, NACCHO staff attended the meetings below.
 - July 11, 2017: Attended the Illinois Summit on Antimicrobial Stewardship. The purpose of this meeting was to summarize the regulatory and national landscape for antimicrobial stewardship, apply national guidelines and best practices for implementing and evaluating facility antimicrobial stewardship programs, and identify tools and resources for implementing antimicrobial stewardship programs.
 - September 7-8, 2017: Attended the Making Dialysis Safer for Patients Coalition in-person coalition meeting in Atlanta, GA.
 - September 13-14, 2017: Attended Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria Meeting on Prevention and Stewardship, which focused on prevention and stewardship.
 - September 29, 2017: Attended U.S. Stakeholder Forum in Antimicrobial Resistance (S-FAR) meeting. The purpose of the meeting was to convene health organizations to address antimicrobial resistance and identify opportunities to continue to work together.
 - October 24-25, 2017: Two NACCHO staff attended the National Antimicrobial Resistance Monitoring System (NARMS) 2017 Scientific Meeting. The purpose of the meeting was to summarize NARMS progress since the last public meeting in 2014, present recommendations made by the recent FDA Science Board review of NARMS in 2017, and to explore new possible directions for NARMS within a One Health paradigm.
- July 2017 – present: NACCHO maintains an ad hoc group to explore One Health at NACCHO. Through this effort, at least one NACCHO staff person participates in the monthly CDC Zoonoses and One Health Updates (ZPHU) call.
- Ongoing Activities:
 - NACCHO staff and four local health department representatives participate on CORHA workgroup and All-Member calls. Stephanie Black (Chicago, IL) and Hillary Hanson (Flathead County, MT) participate on Workgroup A: Detection and Reporting which aims to identify standardized approaches to detection and reporting of infectious disease outbreaks and exposure events within healthcare facilities and in various ambulatory settings. Dawn Terashita (LA County, CA) and Sri Seshadri (Barren River County, KY) participate in Workgroup B: Investigation and Control Workgroup, developed to identify consistent and coordinated approaches to investigation and control of infectious disease outbreaks and exposure events within

- healthcare facilities and in various ambulatory settings.
- Participate in the following meetings, conference calls, and committees related to:
 - 1) obtaining updates on HAIs, injection safety, antimicrobial resistance, and infection control; and
 - 2) determining how NACCHO can support national efforts to address related issues
 - Safe Injection Practices Coalition partner calls
 - CSTE HAI Standards Committee calls
 - Making Dialysis Safer for Patients Coalition calls
- Convene ASTHO and CSTE via monthly conference calls to discuss HAI activities and share updates.
- Promote HAI prevention and infection control news and resources via NACCHO's regular communication channels that reach nearly 3,000 LHDs.

Guidelines and Guidance:

Please include products that are in progress and planned for the coming year. Include Web links if appropriate.

- None reported.

Position Statements:

- October 25, 2017: [Comment Letter on USPSTF Draft Research Plan for Asymptomatic Bacteriuria in Adults: Screening](https://www.naccho.org/uploads/full-width-images/USPSTF-ASB-Research-Plan_NACCHO.Final.pdf) (https://www.naccho.org/uploads/full-width-images/USPSTF-ASB-Research-Plan_NACCHO.Final.pdf)

Legislation:

- None reported.

Campaigns and related activities:

NACCHO continues to promote campaign resources with local health departments to increase awareness and encourage participation.

- August 1, 2017: [Shared campaign resources for inaugural Fungal Disease Awareness Week](http://essentialelements.naccho.org/archives/7534) (<http://essentialelements.naccho.org/archives/7534>)
- September 28, 2017: [Shared campaign resources for International Infection Prevention Week 2017](http://essentialelements.naccho.org/archives/8109) (<http://essentialelements.naccho.org/archives/8109>)
- October 16, 2017: [Shared campaign resources for Antibiotic Awareness Week 2017](http://essentialelements.naccho.org/archives/8266) (<http://essentialelements.naccho.org/archives/8266>)

Press activities:

- None reported.

Publications:

- August 7, 2017: [Leveraging Local Knowledge and Expertise to Tackle Healthcare-Associated Infections](http://essentialelements.naccho.org/archives/7558) (<http://essentialelements.naccho.org/archives/7558>)
- October 19, 2017: [International Infection Prevention Week 2017: Local Approaches to Combatting Antibiotic Resistance](http://essentialelements.naccho.org/archives/8273) (<http://essentialelements.naccho.org/archives/8273>)

Other items of note:

- None reported.

Ex Officio Report
HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)
Centers for Disease Control and Prevention

Meeting Date: November 8-9, 2017

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

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

Agency represented: **National Institutes of Health (NIH)**

Interim activities and updates:

- We continue to evaluate carriers of Vancomycin-resistant *Enterococcus faecium* (VRE) in our patient population. In a recent study of colonized patients who became culture or PCR negative, more than 20% met the criteria for discontinuation of Contact Isolation, and, of those removed from isolation, more than 2/3 remained decolonized. In a more recent study of VRE “recolonization,” the proportion of total days of antimicrobial treatment was significantly associated with VRE recolonization, suggesting that subsequent antibiotic exposure is a risk factor for VRE recolonization.
- The Clinical Center Hospital Epidemiology team continues to provide oversight for ongoing surveillance of our inpatients (except for behavioral health patients) at the time of admission and during ongoing hospitalization for carbapenemase producing organisms (CPO). Patients on high-risk units (i.e., ICU, stem-cell transplant and NCI units) are swabbed weekly; other patients are screened monthly. Since Jan 2015 we have identified 10 patients colonized with CPO, all from perirectal swabs. We perform approximately 10,000 swabs per year. All 10 patients had isolates that were genetically distinct from each other and from prior isolates identified in our hospital.
- The HES team and their collaborators from the NHGRI and the CC Microbiology Service continue to evaluate our hospital environment as a potential reservoir (and perhaps a ‘breeding ground’ for carbapenemase –producing organisms. One striking finding is that, despite a very low prevalence of patient infections with *bla*_{KPC}-positive organisms, all samples from the waste water pipe draining the ICU contained carbapenemase-producing organisms, suggesting a vast, resilient reservoir. Comparing patient and environmental isolates, we noted species and susceptibility profile differences between environmental and patient CPOs. Common plasmid backbones were identified as shared between both populations, highlighting a potential environmental reservoir of mobile elements that may contribute to the spread of resistance genes.

Guidelines and Guidance:

- None reported.

Position Statements:

- None reported.

Legislation:

- None reported.

Campaigns and related activities:

- None reported.

Press activities:

- None reported.

Publications:

- Vetter P, Dayer J-A, Schibler M, Allegranzi B, Brown D, Calmy A, Christie D, Eremin S, Hagon O, Henderson DK, Iten A, Kelley E, Marais F, Ndoye B, Pugin J, Robert-Nicoud H, Sterk E, Tapper M, Siegrist C-A, Kaiser L, Pittet D. The 2014-2015 Ebola outbreak in West Africa: Hands On. *Antimicrob Resist Infect Control* 2016. (5):1-17. DOI 10.1186/s13756-016-0112-9.
- Wong KK, Davey RT Jr, Hewlett AL, Kraft CS, Mehta AK, Mulligan MJ, Beck A, Dorman W, Kratochvil CJ, Lai L, **Palmore TN**, Rogers S, Smith PW, Suffredini AF, Wolcott M, Ströher U, Uyeki TM. Use of Postexposure Prophylaxis After Occupational Exposure to Zaire ebolavirus. *Clin Infect Dis*. 2016 Apr 26.
- Chertow DS, Nath A, Suffredini AF, Danner RL, Reich DS, Bishop RJ, Childs RW, Arai AE, **Palmore TN**, Lane HC, Fauci AS, Davey RT. Severe Meningoencephalitis in a Case of Ebola Virus Disease: A Case Report. *Ann Intern Med*. 2016 Aug 16;165(4): 301-4.
- Conlan S, Park M, Deming C, Thomas PJ, Young AC, Coleman H, Sison C; NISC Comparative Sequencing Program, Weingarten RA, Lau AF, Dekker JP, **Palmore TN**, Frank KM, Segre JA. Plasmid Dynamics in KPC-Positive *Klebsiella pneumoniae* during Long-Term Patient Colonization. *MBio*. 2016 Jun 28;7(3).
- Conlan S, Lau AF; NISC Comparative Sequencing Program, **Palmore TN**, Frank KM, Segre JA. Complete Genome Sequence of a *Klebsiella pneumoniae* Strain Carrying bla_{NDM-1} on a Multidrug Resistance Plasmid. *Genome Announc*. 2016 Jul 14;4(4).
- Bok K, Prevots DR, Binder AM, Parra GI, Strollo S, Fahle GA, Behrle-Yardley A, Johnson JA, Levenson EA, Sosnovtsev SV, Holland SM, **Palmore TN**, Green KY. Epidemiology of Norovirus Infection Among Immunocompromised Patients at a Tertiary Care Research Hospital, 2010-2013. *Open Forum Infect Dis*. 2016 Sep 8;3(3):ofw169.
- Marston HD, Dixon DM, Knisely JM, **Palmore TN**, Fauci AS. Antimicrobial resistance. *JAMA*. 2016 Sep 20;316(11):1193-1204.
- Vallabhaneni S, Kallen A, Tsay S,...**Palmore TN** et al. Investigation of the First Seven Reported Cases of *Candida auris*, a Globally Emerging Invasive, Multidrug-Resistant Fungus - United States, May 2013-August 2016. *MMWR Morb Mortal Wkly Rep*. 2016 Nov 11;65(44):1234-1237.
- Kodati S, **Palmore TN**, Spellman FA, Cunningham F, Weistrop B, Sen HN. Bilateral posterior uveitis associated with Zika virus infection. *Lancet* 2017. Jan 7;389(10064):125-126.

- Decker BK, Lau AF, Dekker JP, Spalding CD, Sinaii N, Conlan S, Henderson DK, Segre JA, Frank KM, **Palmore TN**. Healthcare personnel intestinal colonization with multidrug-resistant organisms. *Clin Microbiol Infect*. 2017 May 12. pii:S1198-743X(17)30270-7. [Epub ahead of print.]
- Chen M, Conlan S, Lau AF, Dekker JP, Deming C; NISC Comparative Sequencing Program, Henderson DK, Frank KM, **Palmore TN**, Segre JA. Whole Genome Sequencing Overrides a Suspected Case of Carbapenem-Resistant *Enterobacter cloacae* Transmission. *J Clin Microbiol*. 2017 Jun 28. pii: JCM.00915-17.
- Strich JR, **Palmore TN**. Preventing Transmission of Multidrug-Resistant Pathogens in the Intensive Care Unit. *Infect Dis Clin North Am*. 2017 Sep;31(3):535-550.

Other items of note:

- None reported.

Liaison Representative Report
HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)
Centers for Disease Control and Prevention

Meeting Date: November 8-9, 2017

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

Liaison Representative name: Louise Dembry, MD, MS, MBA, FSHEA

Organization represented: **Society of Healthcare Epidemiology of America (SHEA)**

Interim activities and updates:

SHEA Spring 2018: Science Guiding Prevention

Under the leadership of Planning Chair, Dr. Matthew Linam and Vice Chair Dr. Judy Guzman–Cottrill, SHEA Spring 2018 will be held in Portland, Oregon, April 18 – 20, 2018.

SHEA 2018 highlights include:

- Focused scientific abstracts related to healthcare epidemiology, surveillance, implementation science and patient safety, and prevention strategies
- Poster and oral abstract awards for diverse professional fields related to healthcare epidemiology for all career levels
- Cutting-edge healthcare-associated infection prevention and antibiotic stewardship education PLUS sessions on multi-disciplinary and integrated approaches involving implementation science and prevention across the healthcare continuum
- Three Training Courses
 - SHEA/CDC Training Course in Healthcare Epidemiology
 - SHEA Antibiotic Stewardship Training Course
 - Pharmacy Credit will be available for this course
 - SHEA/CDC/AMDA Post-Acute & Long Term Care Course
- Targeted Networking Breakfasts and Breaks
- Nursing credit will be available for the entire conference
- Continuation of the SHEA Mentorship Program
- The continuation of the SHEA Epi Project Competition
- The Women in Epi Networking Breakfast
- Annual SHEA Education & Research Foundation Dinner
- ***New this year:*** Pre-Conference Workshop: *Spreading Information Not Infection: Making Infection Prevention and Hospital Epidemiology Digestible for the Public*

Registration and abstract submission is now open! To find out more and register, please visit the [SHEA Spring 2018](http://sheaspring.org/) Website (<http://sheaspring.org/>).

Applications for Scholarships for SHEA Spring 2018 Conference are now being accepted.

If you know someone interested, direct them to the [SHEA Spring 2018](http://sheaspring.org/) Website (<http://sheaspring.org/>).

Jonathan Freeman Scholarship

The Jonathan Freeman Scholarship was established by SHEA to promote the training of outstanding infectious disease fellows who demonstrate interest in the field of healthcare epidemiology. The society established the scholarship in the memory of Jonathan Freeman,

MD, MPH, a teacher and researcher in field of healthcare epidemiology dedicated to improving the delivery of healthcare through the prevention of nosocomial infections. Dr. Freeman was a founding faculty member who for a decade taught the epidemiology and statistics track of the course. Awardees of the Jonathan Freeman Scholarship will receive the amount of \$500 each to defray the expenses of attending the program. In addition to the \$500 amount, each scholarship recipient will receive a complimentary registration for the SHEA/CDC Training Certificate Course in Healthcare Epidemiology at SHEA Spring 2018 Conference: Science Guiding Prevention.

Gina Pugliese Scholarship

The Gina Pugliese Scholarship was established by SHEA to promote the training of a non-physician infection preventionist (IP) who has shown outstanding interest and leadership in the field or works in a resource limited setting. SHEA established this scholarship in honor of Gina Pugliese, RN, MS, a prominent IP and leader in the field of healthcare epidemiology. Ms. Pugliese was a founding faculty member of the SHEA/CDC Training Course and co-chair for fifteen years. Awardees of the Gina Pugliese Scholarship will receive the amount of a \$500 grant to defray the expenses of attending the program. In addition to the \$500 amount, each scholarship recipient will receive a complimentary registration for the SHEA/CDC Training Certificate Course in Healthcare Epidemiology at SHEA Spring 2018 Conference: Science Guiding Prevention.

Bill Rutala Scholarship

The Bill Rutala Scholarship was established by SHEA to promote the training of a non-physician interested in the research of healthcare-associated infections. SHEA established this scholarship in honor of William Rutala, MS, MPH, PhD, a prominent SHEA leader the field of healthcare epidemiology research. Dr. Rutala was the SHEA Lectureship awardee in 2012 and has worked tirelessly researching areas such as disinfection, sterilization, cross-infection, healthcare-associated infections, outbreaks, antibiotic-resistant pathogens. Awardees of the Bill Rutala Scholarship will receive the amount of a \$500 grant to defray the expenses of attending the program. In addition to the \$500 amount, each scholarship recipient will receive a complimentary registration for the SHEA/CDC Training Certificate Course in Healthcare Epidemiology at SHEA Spring 2018 Conference: Science Guiding Prevention.

SHEA/CDC Outbreak Response Training Program (ORTP)

Outbreak Response Training Program (ORTP) is designed to provide US hospital epidemiologists with the tools and training in incident management to protect patients and healthcare workers during public health emergencies as well as non-emergent situations such as facility outbreaks. To find out more, please visit the [ORTP section](http://ortp.shea-online.org/) of the SHEA website (<http://ortp.shea-online.org/>).

Below is the list of completed and in progress projects so far.

- 3 Effective Communication Webinars
 - The first webinar, “Communication during Crisis” presented by Dr. E. Yoko Furuya, was held Monday, February 6, 2017. There were 3,662 total registrants and 2,592 total webinar participants. The phone line was maxed out with 150 people calling-in as well. The webinar was recorded and is available [online](http://bit.ly/2kDThM8) (<http://bit.ly/2kDThM8>)
 - The second webinar, “Conflict Management” presented by Dr. Stephen Weber, was held Tuesday, May 23. There were 2,171 total registrants and 1,316 total webinar participants. The phone line was maxed out with 150 people calling-in as well. The

- webinar was recorded and is available [online](http://bit.ly/2qW0p9Z) (<http://bit.ly/2qW0p9Z>).
 - The final webinar, Beating the Media Crush During a Crisis was held July 11, 2017. A total of 1,013 participants attended the LIVE webinar and 1,675 attendees pre-registered. We've posted the slides and the link to the recording on the [ORTP website](http://ortp.shea-online.org/webinars/webinar-beating-the-media-crush/) (<http://ortp.shea-online.org/webinars/webinar-beating-the-media-crush/>).
- 2 In-person Training Workshops
 - The first In Person Regional Training Workshop was a success with 163 attendees. The sessions from this workshop will be recorded and made available online.
 - The second in person workshop will be held January 23 – 24, 2018 in Los Angeles, California at the Grant Hotel.
- 2 “DecisionSim” Online Modules
 - These modules launched August 31st. To complete, please visit the [ORTP Training website](http://ortp.shea-online.org/online-training/) (<http://ortp.shea-online.org/online-training/>).
- Expert Guidance
 - The “Outbreak Response and Incident Management: SHEA Guidance and Resources for Healthcare Epidemiologists in United States Acute Care Hospitals” was submitted to Infection Control and Hospital Epidemiology (ICHE). It was endorsed by AACN, ACEP, CSTE, HCA Healthcare, IDSA, The Joint Commission, NACCHO, and PIDS, and cleared by CDC. The submission was accepted and is being processed.
- Tool Kits
 - Four digital tool kits will provide an at-a-glance virtual “pocket card” of the expert guidance, as well as quick access to expert-selected resources under the main topic headers: Incident Management; Communication, Negotiation, and Implementation; Outbreak Response; and Emerging Pathogens. The developers are programming the tool kits, whose content was written by members of the ORTP Expert Guidance and Advisory Panels, as well as an implementation scientist from Kaiser Permanente.

Antimicrobial Stewardship Research Workshop

The Workshop dates for 2017 are November 15 – 16 and we currently have **132** registrants as of October 19th for the second Workshop in Chicago, Illinois. In 2018, the final workshop will be November 13 -14 in Baltimore, Maryland at the Royal Sonesta Harbor Court. To find out more, please visit the [Workshop Website](http://www.asresearchworkshop.org/) (<http://www.asresearchworkshop.org/>).

Antimicrobial Stewardship Podcasts

SHEA’s first Podcast Series launched in January features four discussions on practical approaches and applications in stewardship. The first podcast was released in January, 2017 ‘Focusing Stewardship to Help Tackle *Clostridium difficile* associated diarrhea (CDAD)’ and the two panelists were Libby Dodds-Ashley, PharmD and Larissa Mays, MD. The remaining three podcasts will launch in the next three months. In October, the System Change or Social Change Podcast featuring panelists Julia E. Szymczak, PhD and James Lewis, PharmD will release followed by Upper Respiratory Infections and Role of Antimicrobials Podcast featuring panelists Debra Palazzi, MD, MEd and Ellen Wald, MD in November as well as The Big Picture on UTI Podcast featuring panelists Susan E. Coffin, MD, MPH and Chris Crnich, MD, PhD, MS in December.

IDWeek 2017

Hilary Babcock, MD alongside the Vice Chair, Ebbing Lautenbach, MD, MPH and SHEA committee representatives: Kavita Trivedi, MD, Kristina Bryant, MD, Arjun Srinivasan, MD, Tara Palmore, MD, identified the sessions for IDWeek 2017. Neil Fishman, MD was selected for the SHEA Lectureship. SHEA also worked with Drs. Emily Spivak and Tamar Barlam to execute our 'Best Practices for Antimicrobial Stewardship Programs' pre-meeting workshop. There were 245 registrants. IDWeek 2017 had the highest attendance yet at an IDWeek.

Primer on Healthcare Epidemiology, Infection Control and Antimicrobial Stewardship

SHEA launched its Online Primer on June 1, 2015. This online educational course offers any Infectious Diseases practitioner or Fellow an opportunity to learn the basics of healthcare epidemiology, infection prevention and antimicrobial stewardship. Written by experts from adult and pediatric healthcare epidemiology, case-based information is presented in a dynamic and interactive learning environment intended to highlight the role of the healthcare epidemiologist. With 12 modules and topics varying from 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, to name a few. This course has been very well received by Fellows and Physicians in the field. 4 CME credits are available for this course. This is a product of the membership of the Society of Healthcare Epidemiology of America and is endorsed by the Infectious Diseases Society of America (IDSA) and Pediatric Infectious Diseases Society (PIDS). SHEA recently added Maintenance of Certification (MOC) points for the Primer. The online primer will be updated in 2018 to include more relevant content.

Guidelines and Guidance:

Please include products that are in progress and planned for the coming year. Include Web links if appropriate.

The Guidelines Committee (GLC) is currently engaged in the following projects:

- Expert Guidance: Duration of Contact Precautions (Chairs Drs. Banach and Bearman)
 - Submitted to ICHE; endorsed by APIC and SHM
- Expert Guidance: Infection Prevention Practices in the Anesthesia Work Area (Chair Dr. Munoz-Price)
 - Recommendations being finalized; manuscript being prepared for external review
- Expert Guidance: Initiation of Antibiotics in Long-Term Care (Chair Dr. Christopher Crnich)
 - Articles selected from literature search
 - Document being written in two phases, with the first focusing on non-localizing symptoms
- 4 companion white papers to HICPAC NICU Guideline
 - Process reinitiated and presented to GLC, Publications Committee, and ICHE Editor
 - *C. difficile* draft being revised to reflect categorization as a "white paper"
 - Intention to submit to ICHE in alignment with HICPAC publication schedule

The patient education brochure, developed during the 2014 Compendium Update, has been

cleared by CDC and approved by the Compendium Partners: IDSA, APIC, AHA, and The Joint Commission. It was translated by CDC into Spanish, CDC is developing the final designed version for both the English and Spanish brochures.

ORTP Expert Guidance: The “Outbreak Response and Incident Management: SHEA Guidance and Resources for Healthcare Epidemiologists in United States Acute Care Hospitals” was submitted to Infection Control and Hospital Epidemiology (ICHE). It was endorsed by AACN, ACEP, CSTE, HCA Healthcare, IDSA, The Joint Commission, NACCHO, and PIDS, and cleared by CDC. The submission was accepted and is being processed.

Upcoming Commitments:

- Update to Guideline on Management of Healthcare Workers Infected with HIV, HBV, HCV 2017 review statement posted on the [SHEA website \(http://www.shea-online.org/index.php/practice-resources\)](http://www.shea-online.org/index.php/practice-resources).
- Update to 2008 SHEA/APIC Guideline on Infection Prevention in LTC (2 expert guidance documents)
- Update to 2008 CDC Guideline on Sterilization and Disinfection (3 expert guidance documents)

Recent Reviews:

- AMMI Canada Asymptomatic Bacteriuria Stewardship Initiative
- AORN high-level disinfection guideline
- AORN Medication Safety guideline
- IDSA/SHEA *C. difficile* treatment guideline
- WHO Preferred Product Characteristics (PPC) for HCW PPE for viral hemorrhagic fevers in tropical climates

SHEA Research Network (SRN)

Two projects are currently open in the SRN on sick staff and visitor policies (Brown University) and status and characteristics of water management programs in acute care, with a focus on Legionella (Emory University). Three additional projects are under review on the topics of measures to optimize urine culture ordering, processing, and reporting, assessing medical students' basic knowledge of infection prevention and control, and CLABSI reporting. The SRN recently completed dissemination of a Joint Commission feedback request on resources needed for when to use respiratory protection in the clinical setting and a summary of two projects: "Do Experts Understand Performance Measures?" (PI Dr. Govindan) and "Knowledge Sharing in Infection Prevention in Routine and Outbreak Situations" (PI Dr. Sommerstein).

Position Statements:

- None during this reporting period

Legislation:

Legislative Agenda

2017 Budget and Appropriations: SHEA continues to advocate for robust federal funding for CDC, AHRQ and NIH in support of medical research and public health prevention initiatives and state-level infrastructure needs. SHEA has been working collaboratively with a variety of public

health community coalitions in mobilizing advocates to communicate a message of support to their congressional delegation.

- In September, SHEA participated in the Rally for Medical Research, a lobby day organized in support of robust, sustainable medical research funding for the NIH.
- In October, SHEA drafted and submitted a letter to House Energy and Commerce leadership supporting the CHAMPION Act of 2017 (a bill to provide for funding for community-based healthcare centers), but opposing the use of the Prevention and Public Health Fund to offset the cost of the funding. If enacted, the CHAMPION Act of 2017 would gut the Prevention and Public Health Fund by 57% over 8 years.

Regulatory Policy

- An update of the long-term care interpretive guidelines for the CMS State Operations Manual (Appendix PP) was released in August. SHEA is currently analyzing these updates and will be developing tools and resources for SHEA members.
- SHEA also submitted comments in response to the US Preventative Services Task Force's proposed research agenda for Asymptomatic Bacteriuria in Adults.

Campaigns and related activities:

- None during this reporting period

Press activities:

SHEA published the following Press Releases, mostly to promote ICHE articles, over the past few months.

- Study Shows Nurses' Scrubs Become Contaminated with Bacteria in Hospitals - August 29, 2017
- Antibiotic Guidelines in NICU Improve Prescription Practices for Vulnerable Infants - July 26, 2017
- Narcotics Diversion Results in Outbreak of Serratia Marcescens Bacteria - July 6, 2017
- High Prevalence of CRE in Washington, D.C. Healthcare Facilities – June 15, 2017

SHEA's focus in the next 12 months is ICHE promotion on Social Media.

Publications:

Textbooks

SHEA has two textbooks slated to be released in 2018:

- Practical Implementation of an Antibiotic Stewardship Program
- Practical Healthcare Epidemiology (4th edition)

SHEA Spotlight

The SHEA Spotlight is our weekly advertising supported newsletter that is outsourced to Multiview. We continue to see ad growth that is not related to Journal advertising and our open rate continues to stay strong. If you are interested in subscribing, please contact kweinshel@shea-online.org.

Other items of note:

SHEA announced the Election Results for the 2018 SHEA Board of Trustees. Terms begin

January 1, 2018. Please join us in congratulating the following individuals:

- Vice President: David Henderson, MD, Clinical Center, National Institutes of Health
- Councilors (2): Gonzalo Bearman, MD, MPH, Virginia Commonwealth University Health; Aaron Milstone, MD, Johns Hopkins University
- International Councilor: Mirian DalBen, MD, Hospital Sirio Libanes
- Community Based Healthcare Epidemiology (appointed non-voting): R. Scott Stienecker, MD, Parkview Health

**Liaison Representative Report
HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)
Centers for Disease Control and Prevention**

Meeting Date: November 8-9, 2017

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

Liaison Representative name: Valerie Vaughn, MD

Organization represented: **Society of Hospital Medicine (SHM)**

Interim activities and updates:

- SHM is working with the Health Research and Educational Trust (HRET) to identify strategies for reducing MRSA, CAUTI, C.Diff and CLABSI in hospitals across the United States.
- SHM is a partner to HRET to reduce CAUTI and CLABSI in ICUs.
- SHM developed the antimicrobial stewardship implementation guide and educational modules for hospitalists regarding the implementation of antimicrobial stewardship programs in the hospital
- The guide and modules are available on SHM's website.
- SHM continues to promote its Fight the Resistance Campaign dedicated to promoting awareness and behavior change related to antimicrobial stewardship and appropriate prescribing practices.

Guidelines and Guidance:

Please include products that are in progress and planned for the coming year. Include Web links if appropriate.

- None at this time

Position Statements:

- None at this time

Legislation:

- None at this time

Campaigns and related activities:

- SHM's Fight the Resistance Antimicrobial Stewardship Campaign is ongoing. Several campaign resources may be accessed at the [Fight the Resistance website \(www.fighttheresistance.org/\)](http://www.fighttheresistance.org/).

Press activities:

- None at this time

Publications:

- Bezlotoxumab may lower risk of Clostridium Difficile readmissions (<http://www.the-hospitalist.org/hospitalist/article/146847/hospital-acquired-infections/bezlotoxumab-may-lower-risk-c-difficile>)
- Thirty-Day Readmissions in Hospitalized Patients Who Received Bezlotoxumab With Antibacterial Drug Treatment for Clostridium Difficile Infection (<https://academic.oup.com/cid/article/doi/10.1093/cid/cix523/4080783/Thirty-Day-Readmissions-in-Hospitalized-Patients>)
- CDC data show decline in some hospital-acquired infections (<http://www.the-hospitalist.org/hospitalist/article/149506/hospital-acquired-infections/cdc-data-show-decline-some-hospital-acquired>)
- Observational Study of Peripheral Intravenous Catheter Outcomes in Adult Hospitalized Patients: A Multivariable Analysis of Peripheral Intravenous Catheter Failure (<http://www.journalofhospitalmedicine.com/jhospmed/article/149086/hospital-medicine/observational-study-peripheral-intravenous-catheter>)
- National Trends (2007-2013) of Clostridium Difficile Infection in Patients with Septic Shock: Impact on Outcome (<http://www.journalofhospitalmedicine.com/jhospmed/article/145310/hospital-medicine/national-trends-2007-2013-clostridium-difficile-infection>)

Other items of note:

- None at this time

**Liaison Representative Report
HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)
Centers for Disease Control and Prevention**

Meeting Date: November 8-9, 2017

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

Liaison Representative name: Robert Sawyer, MD

Organization represented: **Surgical Infection Society (SIS)**

Interim activities and updates:

- The fall council meeting was held in San Diego, CA, 22 October. Much of the focus was the planned joint meeting with the Shock Society in an effort to potentially build a single robust meeting around surgical sepsis including clinical, translational, and basic science angles.

Guidelines and Guidance:

Please include products that are in progress and planned for the coming year. Include Web links if appropriate.

- Guidelines for the management of skin and skin structure infections
- Guidelines for the management of appendicitis, including non-operative management

Position Statements:

- None

Legislation:

- None

Campaigns and related activities:

- None

Press activities:

- [Article](http://www.generalsurgerynews.com/In-the-News/Article/09-17/CDC-Issues-Guidelines-to-Halt-Surgical-Site-Infections/44540/ses=ogst?enl=true), "CDC Issues Guidelines to Halt Surgical Site Infections"
(<http://www.generalsurgerynews.com/In-the-News/Article/09-17/CDC-Issues-Guidelines-to-Halt-Surgical-Site-Infections/44540/ses=ogst?enl=true>)

Publications:

- Related to CDC SSI guidelines
 1. Centers for Disease Control and Prevention Guideline for the Prevention of Surgical Site Infection, 2017. Berríos-Torres SI, Umscheid CA, Bratzler DW, Leas B, Stone EC, Kelz RR, Reinke CE, Morgan S, Solomkin JS, Mazuski JE, Dellinger EP, Itani KMF, Berbari EF, Segreti J, Parvizi J, Blanchard J, Allen G, Kluytmans JAJW, Donlan R, Schechter WP; Healthcare Infection Control Practices Advisory Committee. JAMA Surg. 2017 Aug 1;152(8):784-791.
 2. Surgical Site Infection Research Opportunities. Itani KMF, Dellinger EP, Mazuski J,

- Solomkin J, Allen G, Blanchard JC, Kelz R, Berríos-Torres SI. *Surg Infect (Larchmt)*. 2017 May/Jun;18(4):401-408.
3. Surgical Perspective: Centers for Disease Control and Prevention Guideline for the Prevention of Surgical Site Infection 2017. Rogers SO Jr. *Surg Infect (Larchmt)*. 2017 May/Jun;18(4):383-384.
 4. Introduction to the Centers for Disease Control and Prevention and the Healthcare Infection Control Practices Advisory Committee Guideline for the Prevention of Surgical Site Infections. Solomkin JS, Mazuski J, Blanchard JC, Itani KMF, Ricks P, Dellinger EP, Allen G, Kelz R, Reinke CE, Berríos-Torres SI. *Surg Infect (Larchmt)*. 2017 May/Jun;18(4):385-393.
 5. Future Research Opportunities in Peri-Prosthetic Joint Infection Prevention. Barbari E, Segreti J, Parvizi J, Berríos-Torres SI. *Surg Infect (Larchmt)*. 2017 May/Jun;18(4):409-412.
 6. Introduction to the Centers for Disease Control and Prevention and Healthcare Infection Control Practices Advisory Committee Guideline for Prevention of Surgical Site Infection: Prosthetic Joint Arthroplasty Section. Segreti J, Parvizi J, Barbari E, Ricks P, Berríos-Torres SI. *Surg Infect (Larchmt)*. 2017 May/Jun;18(4):394-400.
 7. Evidence-Based Update to the U.S. Centers for Disease Control and Prevention and Healthcare Infection Control Practices Advisory Committee Guideline for the Prevention of Surgical Site Infection: Developmental Process. Berríos-Torres SI. *Surg Infect (Larchmt)*. 2016 Apr;17(2):256-61.
- Guidelines, reviews, etc:
 1. Antibiotics vs. Appendectomy for Acute Uncomplicated Appendicitis in Adults: Review of the Evidence and Future Directions. Jared M. Huston, Lillian S. Kao, Phillip K. Chang, James M. Sanders, Sara Buckman, Charles A. Adams, Christine S. Cocanour, Sarah E. Parli, Julia Grabowski, Jose Diaz, Jeffrey M. Tessier, Therese M. Duane. *Surgical Infections*. Jul 2017, 18(5): 527-535.
 2. The Asplenic Patient: Post-Insult Immunocompetence, Infection, and Vaccination. Brandon Dionne, Walter Dehority, Meghan Brett, Thomas R. Howdieshell. *Surgical Infections*. Jul 2017, 18(5): 536-544.
 3. Ventral Hernia Repair: A Meta-Analysis of Randomized Controlled Trials. Julie L. Holihan, Craig Hannon, Christopher Goodenough, Juan R. Flores-Gonzalez, Kamal M. Itani, Oscar Olavarria, Jiandi Mo, Tien C. Ko, Lillian S. Kao, Mike K. Liang. *Surgical Infections*. Aug 2017, 18(6): 647-658.
 4. Literature Review of Criteria for Defining Recipient-Site Infection after Oral Oncologic Surgery with Simultaneous Reconstruction. Masaya Akashi, Junya Kusumoto, Akiko Sakakibara, Kazunobu Hashikawa, Shungo Furudo, Takahide Komori. *Surgical Infections*. Oct 2017, 18(7): 755-764.
 5. Surgical Site Infections after Tissue Flaps Performed in Low- and Middle-Human Development Index Countries: A Systematic Review. Lawrence Z. Cai, James Chang, Thomas G. Weiser, Joseph D. Forrester. *Surgical Infections*. Oct 2017, 18(7): 765-773.
 6. Surgical Site Infection after Sternotomy in Low- and Middle-Human Development Index Countries: A Systematic Review Full. Joseph D. Forrester, Lawrence Z. Cai, Sanford Zeigler, Thomas G. Weiser. *Surgical Infections*. Oct 2017, 18(7): 774-779.

Other items of note:

- The Heather Evans-led project “Assessing the use of patient generated health data and

mobile devices for surgical site infection clinical decision making and surveillance” has been funded as a task order by the CDC for approximately \$600,000, assuming renewal after year one. Using Health Technology Assessment methodology, this project, named ASSIST, will make inroads into the logical and consistent use of patient-generated health data (especially imaging) in the diagnosis, definition, and management of surgical site infections. Dan Pollock has been outstandingly helpful with this application and project.