

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 15-16, 2018

Atlanta, Georgia

Record of the Proceedings

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Meeting Agenda

Healthcare Infection Control Practices Advisory Committee (HICPAC)
November 15-16, 2018
Centers for Disease Control and Prevention
Tom Harkin Global Communications Center (Building 19, Aud. B)
1600 Clifton Rd., NE, Atlanta, GA

Thursday, November 15, 2018

<i>Time</i>	<i>Topic</i>	<i>Purpose</i>	<i>Presider/Presenter (s)</i>
9:00	Welcome and Introductions	Information	Daniel Diekema (HICPAC Co-Chair) Deborah Yokoe (HICPAC Co-Chair) Mike Bell (DFO, HICPAC; CDC)
9:15	CDC Updates: Division of Healthcare Quality Promotion (DHQP)	Information	Denise Cardo (DHQP, CDC)
10:00	Products and Practices Workgroup Update	Information	Vineet Chopra (HICPAC)
10:45	Break		
11:05	NICU Guideline Update: Draft Text and Recommendations	Information/ Discussion	Kristina Bryant (HICPAC)
12:30	Lunch		
2:00	NHSN Workgroup Update	Information/ Discussion	Deborah Yokoe (HICPAC, Co-Chair) Michael Howell (HICPAC)
2:45	HICPAC Recommendation Categorization Update Workgroup: Public Comment Summary and Finalization	Information/ Discussion	Daniel Diekema (HICPAC Co-Chair) Deborah Yokoe (HICPAC Co-Chair)
3:15	Break		
3:35	Updating Infection Control Guidelines	Information	Erin Stone (DHQP, CDC)
4:15	Public Comment		
4:30	Liaison/ ex officio Reports		
5:00	Adjourn		

Friday, November 16, 2018

<i>Time</i>	<i>Topic</i>	<i>Purpose</i>	<i>Presider/Presenter</i>
9:00	Welcome and Roll Call	Information	Daniel Diekema (HICPAC Co-Chair) Deborah Yokoe (HICPAC Co-Chair) Mike Bell (DFO, HICPAC; CDC)
9:15	Healthcare Personnel Guideline Section II Workgroup Update: Draft Text and Recommendations	Information/ Discussion	Hilary Babcock (Workgroup Member)
10:15	Break		
10:30	Setting Action Limits for Water Quality in Healthcare	Information/ Discussion	L. Clifford McDonald (CDC, DHQP)
11:15	Considerations Related to Eye Protection and droplet Precautions	Information/ Discussion	Bryan Christensen (CDC, DHQP)
11:45	Public Comment		
11:55	Summary, Vote, and Work Plan	Information	Daniel Diekema (HICPAC Co-Chair) Deborah Yokoe (HICPAC Co-Chair)
12:00	Adjourn		

List of Attendees

Day 1: November 15, 2018

HICPAC Members

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

ex officio Members

Ms. Yvonne Chow, Health Resources and Service Administration (HRSA)
Ms. Elizabeth Claverie-Williams, Food and Drug Administration (FDA)
Dr. David Henderson, National Institutes of Health (NIH)
Dr. Gary Roselle, US Department of Veterans Affairs (VA)
Dr. Daniel Schwartz, Centers for Medicare and Medicaid Services (CMS)

Liaison Representatives

Ms. Darlene Carey, Association of Professionals of Infection Control and Epidemiology (APIC)
Dr. Craig Coopersmith, Society for Critical Care Medicine (SCCM)
Dr. Louise Demby, Society for Healthcare Epidemiology of America (SHEA)
Ms. Kathleen Dunn, Public Health Agency of Canada (PHAC)
Ms. Kristen Ehresmann, Association of State and Territorial Health Officials (ASTHO)
Dr. Marion Kainer, Council of State and Territorial Epidemiologists (CSTE)
Dr. Alan Klinger, American Society of Nephrology (ASN)
Dr. Chris Lombardozi, America's Essential Hospitals (AEH)
Ms. Dana Nguyen, National Association of County and City Health Officials (NACCHO)
Dr. Mark Russi, American College of Occupational and Environmental Medicine (ACOEM)
Dr. Andrea Shane, Pediatric Infectious Disease Society (PIDS)
Ms. Linda Spaulding, DNV GL
Dr. Valerie Vaughn, Society of Hospital Medicine (SHM)
Dr. Stephen Weber, Infectious Disease Society of America (IDSA)
Ms. Amber Wood, Association of periOperative Registered Nurses (AORN)

CDC Representatives

Sheila Abner, CDC/DHQP
Matt Arduino, CDC/DHQP
Ana Bardossy, CDC/DHQP
Michael Bell, CDC/DHQP
Caitlin Biedron, CDC/DHQP
Allison Brown, CDC/DHQP
Stephanie Bumpus, CDC/DHQP
Denise Cardo, CDC/DHQP
James Chatfield, CDC/DHQP

Sheri Chernetsky-Tejedor, CDC/DHQP
Bryan Christensen, CDC/DHQP
Koo Chung, CDC/DHQP
Kendra Cox, CDC/DHQP
Matthew Crist, CDC/DHQP
Adina deCoteau, CDC/DHQP
Maggie Dudeck, CDC/DHQP
Jonathan Edwards, CDC/DHQP
Chris Elikins, CDC/DHQP
Taniece Eure, CDC/DHQP

Anthony Fiore, CDC/DHQP
Lauren Franco, CDC/DHQP
Nancy Gallagher, CDC/DHQP
Runa Gokhale, CDC/DHQP
Danica Gomes, CDC/DHQP
Jeremy Goodman, CDC/DHQP
Nicole Gualandi, CDC/DHQP
Alice Guh, CDC/DHQP
Jamesa Hogges, CDC/DHQP
John Jernigan, CDC/DHQP
Rima Khabbaz, CDC/DHQP
Athena Kourtis, CDC/DHQP
David Kuhar, CDC/DHQP
Preeti Kuty, CDC/DHQP
Denise Leaptrot, CDC/DHQP
Shelley Magill, CDC/DHQP
Anita Mclees, CDC/DHQP
Matt Moncrief, CDC/DHQP
Kerri Moran, CDC/DHQP
Heather Moulton-Meissner, CDC/DHQP
Hanako Osuka, CDC/DHQP

Margaret Paek, CDC/DHQP
Priti Patel, CDC/DHQP
Kiran Perkins, CDC/DHQP
Joe Perz, CDC/DHQP
Dan Pollock, CDC/DHQP
Krista Powell, CDC/DHQP
Chris Prestel, CDC/DHQP
Sujan Reddy, CDC/DHQP
Keegan Rudmann, CDC/NCIRD
Christina Sancken, CDC/DHQP
Artur Santos, CDC/OD
Eileen Scalise, CDC/DHQP
Zheng Shuai, CDC/DHQP
Brajendra Singh, CDC/DHQP
Erin Stone, CDC/DHQP
Rieko Takahashi McLellan, CDC/DHQP
Amy Valderrama, CDC/DHQP
Ellen Wan, CDC/DHQP
Rachel Winters, CDC/DHQP
Hsiu Wu, CDC/DHQP

Members of the Public

Michael Anderson, CSTE
Christie Davidson, Ethicon
Karen Dekay, AORN
Valerie Deloney, SHEA
Pam Falk, Northside Hospital
Maryellen Guinan, AEH
Kaitlin Heath, Becton Dickinson
Stephanie Henry Wallace, Cambridge Communications
Shalom Hernandez, Piedmont Healthcare
Kevin Kavanagh, Health Watch USA
Margaret McQuade Drillings, Ethicon Infection Risk Management
Silvia Quevedo, APIC
Maria Rodriguez, Xenex Disinfection Services
Lynn Sehulster, Environmental Disinfection Services
Keith St. John, Professional Disposable International
John Stansbury, FDA
Lisa Tomlinson, APIC
Judy Trawick, HRSA

Day 2: November 16, 2018

HICPAC Members

Dr. Daniel Diekema, Co-Chair
Dr. Deborah Yokoe, Co-Chair
Dr. Hilary Babcock
Ms. Vickie Brown
Dr. Kristina Bryant
Dr. Vineet Chopra
Ms. Elaine Dekker
Ms. Loretta Fauerbach
Dr. W. Charles Huskins
Dr. Lisa Maragakis
Dr. Jan Patterson

***ex officio* Members**

Ms. Yvonne Chow, Health Resources and Service Administration (HRSA)
Ms. Elizabeth Claverie-Williams, Food and Drug Administration (FDA)
Dr. David Henderson, National Institutes of Health (NIH)
Dr. Gary Roselle, US Department of Veterans Affairs (VA)
Dr. Daniel Schwartz, Centers for Medicare and Medicaid Services (CMS)

Liaison Representatives

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Ms. Kathleen Dunn, Public Health Agency of Canada (PHAC)
Ms. Kristen Ehresmann, Association of State and Territorial Health Officials (ASTHO)
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Dr. Alan Kliger, American Society of Nephrology (ASN)
Dr. Chris Lombardozi, America's Essential Hospitals (AEH)
Dr. Mark Russi, American College of Occupational and Environmental Medicine (ACOEM)
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Ms. Linda Spaulding, DNV GL
Dr. Valerie Vaughn, Society of Hospital Medicine (SHM)
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Ana Bardossy, CDC/DHQP
Michael Bell, CDC/DHQP
James Chatfield, CDC/DHQP
Bryan Christensen, CDC/DHQP
Koo Chung, CDC/DHQP
Kendra Cox, CDC/DHQP
Chris Edans, CDC/DHQP
Athena Kourtis, CDC/DHQP
David Kuhar, CDC/DHQP
Cliff McDonald, CDC/DHQP
Kerri Moran, CDC/DHQP

Shannon Novosad, CDC/DHQP
Priti Patel, CDC/DHQP
Kiran Perkins, CDC/DHQP
Joe Perz, CDC/DHQP
Krista Powell, CDC/DHQP
Sujan Reddy, CDC/DHQP
Brajendra Singh, CDC/DHQP
Erin Stone, CDC/DHQP
Rieko Takahashi McLellan, CDC/DHQP
Amy Valderrama, CDC/DHQP
Amber Vazquez, CDC/DHQP

Members of the Public

Michael Anderson, CSTE

Karen Dekay, AORN

Valerie Deloney, SHEA

Pam Falk, Northside Hospital

Maryellen Guinan, AEH

Kaitlin Heath, Becton Dickinson

Stephanie Henry Wallace, Cambridge Communications

Kevin Kavanagh, Health Watch USA

Silvia Quevedo, APIC

Maria Rodriguez, Xenex Disinfection Services

John Stansbury, FDA

Lisa Tomlinson, APIC

Judy Trawick, HRSA

Executive Summary

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 15-16, 2018 in Atlanta, Georgia. The presence of a quorum of HICPAC voting members and *ex officio* members was confirmed and maintained throughout each day of the meeting.

The meeting was called to order at 9:15 am on November 15, 2018. Dr. Denise Cardo provided an update on current DHQP activities. Dr. Vineet Chopra and Ms. Erin Stone presented an update from the HICPAC Product and Practices Workgroup, presenting a draft tool for HICPAC to use when formulating recommendations for products and a “pilot test” of the draft tool.

Dr. Kristina Bryant presented an update from the Guideline for Infection Prevention in Neonatal Intensive Care Unit (NICU) Patients Workgroup, including Key Question reorganization and draft recommendations for *Staphylococcus aureus* (*S. aureus*); central line-associated bloodstream infection (CLABSI); respiratory illness; and “*Core Practices for the NICU.*” HICPAC voted unanimously to approve the draft recommendations for *S. aureus*.

Drs. Deborah Yokoe and Michael Howell provided an overview of the National Healthcare Safety Network (NHSN) Workgroup and the deliberations of the Data and Definitions Subgroup and the Reports and Communication Subgroup. HICPAC unanimously approved the draft recommendation on the NHSN *Clostridioides difficile* infection (CDI) outcome.

Dr. Daniel Diekema described the draft updated HICPAC Recommendation Categorization Scheme. HICPAC unanimously approved these.

Ms. Stone summarized DHQP’s guideline updating process, including potential avenues for streamlining and harmonizing guidelines.

HICPAC stood in recess from 4:45 pm on November 15, 2018 until 9:11 am on November 16, 2018.

Dr. Hilary Babcock provided an update on the Infection Control in Healthcare Personnel Guideline Workgroup’s progress on updating the *1998 Guideline for infection control in healthcare personnel*. Draft recommendations for the Diphtheria and Group A *Streptococcus* sections were presented. HICPAC unanimously approved the draft Meningococcal Disease section.

Dr. Clifford McDonald led a presentation and discussion of setting action limits for water quality in healthcare and the DHQP Water Management and HAI Workgroup.

Dr. Bryan Christensen discussed practical considerations for issues related to eye protection and droplet precautions, particularly for seasonal influenza and other respiratory viruses.

HICPAC stood in recess at 11:56 am on November 16, 2018.

**DEPARTMENT OF HEALTH AND HUMAN SERVICES
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 15-16, 2018
Atlanta, Georgia

Meeting Summary

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 15-16, 2018 at the Tom Harkin Global Communications Center at the Centers for Disease Control and Prevention, 1600 Clifton Road NE, Atlanta, Georgia.

Thursday, November 15, 2018

Welcome and Introductions

Erin Stone, MA
Committee Management Specialist
Acting Designated Federal Officer
Healthcare Infection Control Practices Advisory Committee
Division of Healthcare Quality Promotion
Centers for Disease Control and Prevention

Ms. Stone called the meeting to order at 9:15 am. She introduced and welcomed Elaine Dekker, RN, a new HICPAC Member, and noted that another new HICPAC member, Dr. Deverick Anderson, would join them at the next HICPAC meeting. Ms. Stone also welcomed Drs. Hilary Babcock and Charlie Huskins.

Ms. Stone called roll of HICPAC members, *ex officio* members, and Liaison Representatives. Meeting quorum was maintained throughout the meeting. HICPAC members disclosed the following conflicts of interest:

- Dr. Kristina Bryant has been an investigator on clinical trials funded by Pfizer and has received honoraria from MedStudy.
- Dr. Daniel Diekema has received research funding from bioMérieux.
- Dr. Michael Howell is employed by Google Research and owns equity in the company.
- Dr. Lisa Maragakis receives research funding from the Clorox Company.
- Dr. Jan Patterson's spouse has received funding for antifungal research from Merck, Astellas, and Basilea.

CDC Updates: Division of Healthcare Quality Promotion (DHQP)

Denise Cardo, MD
Director
Division of Healthcare Quality Promotion
National Center for Emerging and Zoonotic Infectious Diseases
Centers for Disease Control and Prevention

Dr. Cardo thanked HICPAC members, including the new HICPAC members, *ex officios*, and Liaison Representatives. She provided a broad update on current DHQP activities, emphasizing

that the Division continues to maintain the principles of preventing infections and combating antibiotic resistance (AR) in healthcare, with a focus on patient safety. The 3 complementary aspects of the Division's work are:

- Preventing infections,
- Improving antibiotic use, and
- Detecting and containing emerging threats in a spectrum of healthcare and community settings.

She shared the results of the 2015 Healthcare-Associated Infection (HAI) Prevalence Survey published recently in the *New England Journal of Medicine (NEJM)*.¹ This survey is conducted through the Emerging Infections Program (EIP) every 5 years and complements various ongoing tracking systems within CDC. The purpose of the survey is to assess potentially problematic infections that are not tracked and are not addressed by specific goals and recommendations. In addition, the survey is used to validate trends observed in the data reported to the National Healthcare Safety Network (NHSN). The NHSN definitions were used in 2011 and 2015 prevalence surveys, and most of the hospitals included in the 2011 survey were included in the 2015 survey.

The 2015 HAI Prevalence Survey showed that patients were 16% less likely to have an HAI in 2015 than they were in 2011. The most common infection types included:

- Pneumonia 26%
- Gastrointestinal (GI) infections 21%
- Surgical site infections (SSIs) 16%
- Bloodstream infections (BSIs) unrelated to an infection at another site 12%
- Urinary tract infections (UTIs) 9%

The 2015 prevalence survey showed important decreases in central line-associated urinary tract infection (CAUTI) and SSI compared to the 2011 survey. The 2015 survey showed a small decrease in BSIs, but major decreases were observed in central line-associated bloodstream infections (CLABSIs) before 2011.

A few years ago, former CDC Director Dr. Thomas Frieden made HAIs a “Winnable Battle” for the agency. Reducing HAIs was an HHS goal as well. Leadership from pertinent HHS agencies met with HHS several times a year to provide progress reports on HAI reduction with initial focus on CLABSI, and later on CAUTI. CDC, CMS, and the Agency for Healthcare Research and Quality (AHRQ) worked together to meet HHS goals. For example, for CAUTI prevention, CDC tracked the infections, did several assessments to identify gaps in prevention, and worked closely with the Centers for Medicare and Medicaid Services (CMS) and AHRQ to target prevention. The prevalence survey confirmed the decrease of CAUTI as observed with NHSN data, as well as in urinary catheter use, which was the main prevention strategy, from 2011 to 2015, illustrating that policies, coupled with federal and state agencies working together with partners in healthcare, can make a difference.

Data from the prevalence survey also showed where room for improvement remains. For example, similar to trends observed in EIP and NHSN, data show that the goal for *Clostridioides difficile* (*C. difficile*) reduction has not been achieved. Additionally, pneumonia has remained at its 2011 level. Prevalence surveys from countries in Europe conducted by the European Centre for Disease Prevention and Control (ECDC) show that pneumonia is also an issue there. DHQP continues to work to prevent these infections and to understand why they continue to occur.

¹ Magill, S.S., et al. Changes in Prevalence of Health Care-Associated Infections in U.S. Hospitals. *New England Journal of Medicine*. 2018. 379:1732-1744

Following prevention guidelines for device-associated infections, including decreasing catheter use and improving practices, made a significant impact in the reduction of these infections, but more needs to be done. We need to learn from the infections not being prevented to determine how to prevent them, especially given new knowledge about risk factors and innovation such as the microbiome, decolonization, etc.

To address non-ventilator associated pneumonia, DHQP is working with the CDC Prevention Epicenters and with healthcare facilities that are implementing strategies for the prevention of pneumonia to establish a definition of pneumonia using data that are captured electronically and reliably.

C. difficile infections continue to be a challenge, since they occur in healthcare and community settings. Inpatient *C. difficile* represents 59% of the total number of *C. difficile* infections in the US, and 41% are community-associated; healthcare exposures are critical to community-onset *C. difficile* in the US.

- Hospital-onset: 22%
- Nursing home-onset: 17%
- Long-term acute care hospital-onset: 1%
- Community-onset with recent inpatient exposures: 20%
- Community-associated with recent outpatient exposures: 34%
- Community-associated with no healthcare exposures: 7%

The major driver for *C. difficile*, in addition to basic infection control and environmental cleaning practices, is the use of antibiotics. Studies conducted by DHQP have shown the correlation of decreasing either overall use of antibiotics, or the use of specific antimicrobials such as fluoroquinolones, with a decrease in *C. difficile*. Because of slow prevention progress, DHQP is focusing on *C. difficile* prevention as part of its overall portfolio management. This focus includes measuring progress on a quarterly basis and considering potential additional approaches to address asymptomatic individuals and stewardship.

DHQP is also focusing on the prevention of methicillin-resistant *Staphylococcus aureus* (MRSA). NHSN data depict a gradual decline in hospital-onset MRSA bacteremia from 2011-2014, and NHSN's new standardized infection ratio (SIR) baseline shows a 6.5% decline between 2015 and 2016. Notable decreases were recently observed in strain 300, which saw a 50% - 60% decrease. However, a plateau is now observed in both hospital- and community-onset MRSA. Additional, more aggressive approaches are needed to meet the HHS target of reducing the hospital-onset MRSA bacteremia SIR by 50% from the 2015 baseline by 2020. Like *C. difficile*, MRSA is not just a problem for hospitals. Healthcare-associated, community-onset MRSA BSI affects other healthcare settings, where similar patterns are observed. The role of CLABSI in these rates is small.

To further address the challenges of healthcare-onset, community-associated, and healthcare-associated, community-onset MRSA infections, DHQP is utilizing elements of surveillance, prevention, epidemiological research, and innovation. Potential approaches include working with specific states, with networks of hospitals and healthcare facilities, investing in new knowledge and other ways to show that these infections can be prevented. A decade ago, CDC's and AHRQ's studies demonstrated that following the CDC guidelines resulted in a major prevention impact on CLABSIs: the same needs to be done for *C. difficile* and MRSA across the healthcare spectrum.

An increase in invasive MRSA has been observed in several parts of the US among people who inject drugs (PWID). In 2017, 29% of invasive MRSA in Maryland, and 25% in New York, were

associated with injection drug use.² DHQP is working with EIP on evaluations. Additionally, data from several datasets are being used to assess trends: 45% of these cases are endocarditis.³ Similar patterns are observed with *Candida*, posing challenges not only when PWID present to the hospital, but also regarding how to implement infection control practices for this population, such as in needle exchange programs.

The Division's work with state partners regarding both healthcare and community aspects of *C. difficile* and *S. aureus* is critical, considering that patients move between facilities and settings. DHQP is expanding its partnerships to include a variety of groups that will embrace and pursue the concept that prevention and reduction of infections is possible.

Antibiotic use is another important aspect of DHQP's work. In US doctors' offices and emergency departments (EDs), 30% of the outpatient antibiotics that are prescribed are unnecessary. While the remaining may be necessary, the prescriptions do not always align with guidelines. There is room for improvement in drug selection, dose, and duration. Some of the diagnoses that led to antibiotic prescriptions in doctors' offices, hospital clinics, and EDs between 2010-2011 were viral infections.⁴ An increase in antibiotic prescriptions also is observed during influenza season. Focusing on these specific issues is critical. DHQP is working with EDs, outpatient clinics, and urgent care facilities to change this paradigm of over-prescribing or incorrectly prescribing.

Progress has been observed in advancing implementation of antimicrobial stewardship programs in the US. Among US hospitals, 76% reported that they have an antibiotic stewardship program in place that meets CDC's *Core Elements of Antibiotic Stewardship*. Examining the data and working with partners, especially the Health Resources & Services Administration (HRSA) Federal Office for Rural Health Policy (FORHP), DHQP was able to determine that small hospitals and critical access hospitals were not always able to implement the *Core Elements of Antibiotic Stewardship*. Therefore, that resource was adapted for these settings in *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>). In addition to using this resource as guidance for stewardship, these facilities use it as part of their reimbursement goals. Another adaptation of the *Core Elements of Antibiotic Stewardship*, designed for countries with limited resources, is available: *The Core Elements of Human Antibiotic Stewardship Programs in Resource-Limited Settings: National and Hospital Levels* (<https://www.cdc.gov/antibiotic-use/healthcare/pdfs/18-295875-A-ASP-CE-Web-508.pdf>). The World Health Organization (WHO) utilizes this document in its work.

Even as progress is made in number of hospitals with antibiotic stewardship programs, it is important to understand the quality of these programs. To this end, DHQP works with The Joint Commission (TJC) and other accreditation groups, as well as with CMS, to develop tools for surveyors.

CDC also developed stewardship training modules for CMS's Merit-based Incentive Payment System (MIPS), which requires physicians to complete specific trainings, for completing CDC's Antibiotic Stewardship Training Series (<https://www.cdc.gov/antibiotic-use/community/for-hcp/continuing-education.html>).

² Jackson KA, Bohm MK, Brooks JT, et al. Invasive Methicillin-Resistant *Staphylococcus aureus* Infections Among Persons Who Inject Drugs — Six Sites, 2005–2016. *MMWR Morb Mortal Wkly Rep* 2018; 67:625–628

³ Felsen, C.B., et al. Increasing Incidence of Invasive Methicillin-Resistant and Methicillin-Sensitive *Staphylococcus aureus* Infections among Persons Who Inject Drugs, 2014-2017. ID Week. 2018. Abstract #1211

⁴ Fleming -Dutra KE, Hersh AL, Shapiro DJ, et al. *JAMA* 2016 May 3;315(17):1864–73

US Antibiotic Awareness Week is November 12-18, 2018 (<https://www.cdc.gov/antibiotic-use/week/index.html>), with notable activities and focus areas:

- Collaborating with domestic and international partners to raise awareness of the threat of AR and the need to improve antibiotic prescribing and use.
- Promoting the “Be Antibiotics Aware: Smart Use, Best Care” campaign, CDC’s national educational effort to keep patients safe, decrease adverse drug events, and help fight antibiotic resistance.
- Highlighting Antimicrobial Resistance (AMR) Challenge commitments that organizations have made to fight against AR.
- The week aligns with WHO’s World Antibiotic Awareness Week and the ECDC’s European Antibiotic Awareness Day.

CDC continues to educate patients, physicians, and the public about sepsis prevention and early intervention. Dr. Cardo emphasized the importance of aligning antibiotic use efforts with this work on sepsis: they can seem to be “two different messages,” but CDC is proactive in stressing that the patient is the same. When antibiotics are necessary, then they must be used; however, reassessment is also necessary. Often, the term “unnecessary use” does not refer to a critical patient entering the hospital. “Unnecessary use” is observed among outpatients, for illnesses that are not infections. In many facilities, healthcare epidemiologists and practitioners do not work closely with sepsis program personnel. It is critical to consider how to integrate programs.

The coming year will focus on *C. difficile*, invasive MRSA, improving antibiotic use, and the Containment Strategy, a concept that came to the forefront during the Ebola experience, with health departments playing a critical role. This strategy is important not only for finding new, emerging resistance, but also for infection control assessment. The Containment Strategy involves:

- Rapid detection in healthcare facilities
- Infection control assessments led by the health department
- Colonization screenings when needed
- Coordination between healthcare facilities
- Continued vigilance until spread is controlled

Colonization screening is conducted by the Antibiotic Resistance Laboratory Network (ARLN, or AR Lab Network), which has nationwide laboratory capacity to detect AR in healthcare, food, and the community. The ARLN tracks resistance to identify outbreaks faster, stop spread, and protect people. This work involves CDC laboratory expertise and coordination of 7 regional laboratories, 1 National Tuberculosis (TB) Molecular Surveillance Center, and state and local laboratories. A social network is used to see which facilities transfer patients with cases, and infection control assessments and colonization screenings continue until spread is no longer observed.

The Containment Strategy and ARLN enable rapid detection of, and response to, novel resistance. The cumulative number of isolates tested by the ARLN for carbapenem-resistant *Enterobacteriaceae* (CRE) and carbapenem-resistant *Pseudomonas aeruginosa* (CRPA) was 11,557 in 2017, and 12,376 as of August 31, 2018. The cumulative number of colonization screening swabs tested by the ARLN was 2022 in 2017, and 6581 as of August 31, 2018. The cumulative number of CDC-supported AR containment responses was 152 in 2017, and 107 as of August 31, 2018. The connection between health departments and experts in healthcare epidemiology has been critical to detect and contain these infections.

The AMR Challenge (<https://www.cdc.gov/drugresistance/intl-activities/amr-challenge.html>) is a yearlong CDC-HHS initiative to bolster efforts across sectors and around the world to “step up, partner, and each play our part in the fight against AMR.” This global initiative was launched by HHS Secretary Azar at the United Nations (UN) General Assembly in September 2018 to stimulate engagement and accountability. More than 130 commitments to action have been made by governments, private industry, and civil society from around the world across 5 commitment areas:

- Tracking and Data
- Infection Prevention and Control
- Antibiotic Use
- Environment and Sanitation
- Vaccines, Diagnostics, Therapeutics

For example, some healthcare systems have committed to concrete goals and timelines for decreasing specific infections and improving antibiotic use. Commitments requests will conclude in September 2019 at the UN General Assembly meeting to show global progress to continue the fight against AMR around the world.

Dr. Cardo shared highlights from recent meetings, observing that more groups are incorporating sepsis into healthcare epidemiology:

- “Sepsis Alliance: Sepsis Heroes” meeting in September 2018 in New York City. The Sepsis Alliance had an infection control training session as part of sepsis activities.
- At the Rory Staunton Foundation’s “5th National Forum on Sepsis” in October 2018 in New York City, several states reported having policies specific to addressing sepsis.
- The World Sepsis Congress meeting in September 2018 included numerous presentations about hand hygiene, prevention of infections, and stewardship.
- The “Interdisciplinary Sepsis Symposium” in Chicago in September 2018 was attended by representatives from several federal agencies.
- CDC is working with the Biomedical Advanced Research and Development Authority (BARDA) on their Solving Sepsis project, determining how to use the Epicenters to address sepsis and to determine how to embed antibiotic de-escalation in their planned initiatives.
- The “World Health Summit” in Berlin in October 2018 took place at the same time as the “Global Grand Challenges Gates Foundation.” AMR was a priority for many countries. It is clear that new antibiotics and new prevention approaches are needed.

Discussion Points

HICPAC observed that one of the concerns about infectious complications among PWID pertains to detection of injection drug use: while infectious complications may be recognized, their cause may not be identified during hospitalization, which limits the ability to intervene for prevention purposes.

Dr. Cardo replied that consideration has been given to how best to intervene in these populations and how such interventions might impact prevention strategies within facilities. It has become clear that steps should be taken before PWID present to facilities. Basic prevention control is likely needed, particularly given that needle exchange programs do not promote infection control: their focus is largely on hepatitis and HIV.

Products and Practices Workgroup Update

Vineet Chopra, MBBS, MD, MSc, FACP, FHM
Chair, HICPAC Products and Practices Workgroup

Erin Stone, MA
HICPAC Committee Management Specialist
Division of Healthcare Quality Promotion
Centers for Disease Control and Prevention

The Products and Practices Workgroup's charge is to:

- Develop a process for HICPAC to use when formulating recommendations for products;
- Describe how these criteria may be different from those used to develop practice-specific recommendations; and
- Provide a rationale for the criteria.

The Workgroup was formed in July 2017, presented its first draft worksheet and tool to HICPAC in November 2017, and presented another update to HICPAC in May 2018.

The objective of this worksheet/tool is to guide HICPAC in product reviews and recommendations. Key tenets underlying this effort are:

- Products that may contribute to HAI prevention should be as fairly and fully evaluated as clinical practices.
- The process should be transparent.
- Research for a product should be evaluated consistently and assessed for possible bias.
- Innovation in product development can result in better solutions to meet needs for patients.
- Products may be the most effective intervention available for preventing specific HAIs.

HICPAC provided useful feedback on a draft of the worksheet in May 2018, which the Workgroup has incorporated into a new draft:

- Include a path for evaluating off-label use if the label does not describe safety concerns.
- Efficacy and quality of the evidence could be combined into one overall evaluation of the quality of the evidence.
- It is important to explicitly name funding sources to identify any potential bias when evaluating the evidence.
- Integrate human factor needs, such as education and time needed to achieve competency.

Dr. Chopra shared a visual of the updated worksheet. The first question (Node A) is, "Is the product or device Food & Drug Administration (FDA) approved/ cleared/ granted or Environmental Protection Agency (EPA) registered?" If the answer is "yes," then the review moves forward. In earlier iterations of the tool, if the answer was "no," the review would stop. In this updated draft, two considerations are offered if the answer is "no:"

- No: FDA/EPA label is not required and marketing materials do not make medical or mitigation claims (Proceed to Node B)
- No: marketing materials make medical or mitigation claims: **(STOP - HICPAC will not review products or devices that are not approved and make these claims)**

Node B addresses the approval type (Pre-Market Approval (PMA), *de novo*, 510(k), EPA registered), which involves searching the FDA or EPA databases for similar products or devices. The Workgroup has experienced challenges in finding this data.

Node C, a new node in this updated draft, focuses on the accordance of the product with the FDA label. The Node asks, "For the purposes of this analysis, is the product being considered for use in accordance with FDA-or EPA-approved labels? (Note: review FDA-or EPA-approved labels)." The first step is to review the labels. The review moves forward if the answer is "yes." If

the answer is “no,” it is important to understand how a product is used (eg, population, indicated use, setting, etc). If off-label use is considered in a certain setting or context, consideration is given to whether evidence of safety is available. If specific safety concerns are not reflected on the label, the review proceeds. However, if safety concerns are noted, the review stops.

Node D considers clinically relevant human outcomes and proxy outcomes as reported in peer-reviewed literature. Node E looks at the indications for use and the label claim. This information is retrieved verbatim from the sources described by the manufacturer. Node F asks whether the product is marketed for infection prevention: as with other Nodes, the manufacturer’s marketing material is used to inform this point.

Node G focuses on the quality of evidence for the product’s efficacy, including whether there are pre-specified clinically relevant outcomes, supporting indications for use, supporting label claims, and/or marketing data. The available evidence is summarized, including:

- Source of evidence (eg, was the evidence published in peer-reviewed journals, or was it provided to FDA as pre-market data?)
- Type and quality of the evidence
- Funding source of the evidence
- References for the evidence
- Whether the evidence supports the marketing

Node H pertains to pre- and post-marketing evidence of safety or potential harms. This point includes a review of FDA submissions whenever possible, as well as a review of harm assessments in published data, if available in observational studies and randomized controlled trials.

Node I summarizes the collected data to assess the balance of the product’s harms versus benefits. Node J addresses whether a product is superior over established alternatives; that is, the standard of care, bearing in mind that the standard of care can change over time. Node J describes the context of the study performance, the standards of care when the product was reviewed, and whether the study evaluates compliance with these standards of care.

Node K determines whether the product demonstrates impact when it is used alone or as part of a bundle; whether the product was evaluated in addition to bundle elements or in place of one of the bundle elements; and whether the impact is measurable or reported outside of the bundle.

Nodes L and M build upon Node K to assess generalizability to a product class at the time the evidence is reviewed (Node L) and across clinical settings, environments, and populations (Node M). Node L considers active ingredients, mechanism of action, product design, instructions for use, etc. Node M considers whether the benefit/harm assessment is the same across settings, patient populations, etc.

Node N addresses resource implications, including human, materials, education and training, and financial costs. Node O considers whether this assessment will inform or support a recommendation and will include a sentence that summarizes Nodes B-N, regardless of whether a statement is made to support a recommendation.

Dr. Chopra noted that HICPAC had requested a “walk through,” applying the draft tool to an example of a product. Ms. Stone presented an application of the tool to silver alginate catheter dressings, an example from the in-progress Neonatal Intensive Care Unit (NICU) Guideline.

After the draft tool was applied to pre-existing product-specific recommendations from the CAUTI Guideline, the NICU Guideline Workgroup applied it to products that were retrieved as part of the literature search for the CLABSI section of the NICU Guideline. The original literature search, conducted in 2012, identified 2 articles from 2010 that examined the safety of silver

alginate and maltodextrin-coated catheter dressings for preventing CLABSI in NICU patients. No new studies were identified in the 2018 literature search update.

- Khattak AZ, Ross R, Ngo T, Shoemaker CT. A randomized controlled evaluation of absorption of silver with the use of silver alginate (Algidex) patches in very low birth weight (VLBW) infants with central lines. *J Perinatol.* 2010 May;30(5):337-42
- Hill ML, Baldwin L, Slaughter JC, Walsh WF, Weitkamp JH. A silver-alginate-coated dressing to reduce peripherally inserted central catheter (PICC) infections in NICU patients: a pilot randomized controlled trial. *J Perinatol.* 2010 Jul;30(7):469-73

The application of the retrieved evidence to the draft tool is as follows:

A. Is the product or device FDA approved/ cleared/ granted or EPA registered?

Unclear: the product in these studies is a silver alginate and maltodextrin matrix that coats a foam dressing, and maltodextrin is noted as improving wound healing. An extensive search did not yield an FDA-approved label for use of the dressing for catheters. An FDA label for a wound dressing of the same type, from the same manufacturer, was found. That label describes different indications for use than the implied indications for intravenous (IV) dressing. Therefore, it is unclear whether the silver alginate IV dressing is approved under the “umbrella” of the FDA wound dressing label. The review proceeded with this point in mind.

B. What is the approval type? (Note: search the FDA or EPA database for similar product types)

If the product was approved, it was via the 510(k) pre-market mechanism; it was approved on the basis of a predicate silver alginate impregnated dressing.

C. For the purposes of this analysis, is the product being considered for use in accordance with FDA-or EPA-approved labels? (Note: review FDA-or EPA-approved labels)

Unclear: labels were not found for catheter dressing, only wound dressing.

D. What are the clinically relevant human outcomes? Proxy outcomes?

The clinically relevant human outcomes determined for the *NICU Guideline* were:

- CLABSI
- Catheter-associated/related bloodstream infections
- BSI in general
- Silver absorption for this specific product
- Adverse product-related reactions (eg, topical)

E. What are the indications for use? Label Claim?

The manufacturer website provides this information:

“INDICATIONS: Dialysis catheters, Central venous lines, Arterial catheters, External fixator pins, Epidural catheters, Peripheral IV catheters, Gastrostomy feeding tubes, Non-vascular percutaneous devices”

The 2009 package insert for use of the product as a wound dressing does not refer to central venous lines or related uses, and states:

“Used for the management of exudating wounds including: Pressure ulcers, venous ulcers, dermal lesions (or secreting skin injuries), second degree burns, donor sites”

A 501(k) summary for use as a wound dressing dated April 4, 2018, states:

“Indications for use: Abrasions and lacerations, dermal wounds, donor sites, first and second-degree burns, surgical incisions, *vascular access sites*, pressure ulcers stages I-IV, stasis ulcers, venous ulcers”

The 2018 wound dressing 510(k) summary further notes that, “The results indicate the inhibition of microorganism growth within the dressing over the seven-day wear-time of the dressing. The antimicrobial barrier was shown for three days.”

Ms. Stone recalled the recent update to the recommendation for chlorhexidine-impregnated dressings. In this case, the chlorhexidine impregnated in the dressing was intended to protect the dressing itself, not to the site, and its 510(k) approval was based on this use. Similarly, it appears that for silver alginate maltodextrin dressings, the matrix coating is intended to reduce microbial growth within the dressing and not at the site, and the label claim is worded as such. No NICU-specific indications are described on the foam wound dressing package insert label claims, which include the following:

- “Dressing provides slow, extended release of active ionic silver for broad antimicrobial effectiveness and helps to prevent contamination from external bacteria.”
- Dressings absorb wound exudate, decreases surface wound contaminants, decreases wound odor, and creates a moist environment conducive to healing.”
- “The maltodextrin creates an environment that helps the body’s own cells to carry out the task of granulation tissue formation while eliminating wound odor.”

F. Is the product marketed for infection prevention?

The website and marketing materials state the following:

- “Wound dressing is an effective bacterial barrier to help prevent catheter related infections.”
- “Provides quick and sustained antimicrobial barrier against a broad spectrum of wound pathogens associated with catheter related infections.”

A patch poster on the IV dressing website states that it:

- “Reduces bacterial colonization associated with catheter related infections.”
- “Releases active ionic silver for broad antimicrobial effectiveness.”

A basic science paper on the manufacturer’s website compares the silver alginate IV patch to chlorhexidine-impregnated dressings and makes similar claims about preventing infections:

- “The silver catheter dressing has been shown to have similar efficacy to chlorhexidine gluconate (CHG) dressings at inhibiting bacteria growth and combined with a superior safety record make it the ideal antimicrobial barrier dressing for inclusion in CLABSI prevention bundles designed to reduce the risk of nosocomial catheter related bloodstream infections in the clinic.” This statement references an in vitro study comparing dressings.
- “In addition to silver, the silver alginate catheter dressing includes maltodextrin which has been shown to have antibacterial and wound healing properties. Together, ionic silver and maltodextrin create an optimal antimicrobial environment that is effective at preventing infection.”

The paper describes the addition of silver alginate and maltodextrin to the dressing for antibacterial and wound healing properties and for preventing infections. The website links to additional safety and efficacy information, but the only NICU-related information references the Hill and Khattak papers. FDA 510(k) summaries or labels were not found for this product, only

for the companion silver alginate wound dressing, which is indicated for wound management. There is no published evidence on the efficacy of the barrier against pathogens, which is consistent with the FDA 510(k) that was found, and there is no evidence of absorption of exudate.

G. What evidence of efficacy is available?

Two randomized controlled trials (RCTs) evaluated the effect of silver alginate dressings on BSIs (Hill et al, 2010; Khattak et al, 2010). Both studies assessed safety as the primary outcome and infection as a secondary outcome.

The small Hill study (N=100 patients) was conducted to measure adverse events, including peripherally inserted central catheter (PICC)-associated infections in NICU patients. This study was intended to serve as a pilot for a later study to assess efficacy in this population; however, the subsequent study has not been published. The pilot found non-significant reductions in the incidence of PICC-associated BSI of 12.4% (11/89 PICCs) versus 17.2% (5/29 PICCs). It is important to note that PICC-associated BSI is not defined in the article. The study noted that multiple PICCs were assessed per infant, but did not report whether multiple infections occurred per infant, or per PICC. The study also noted that dressings were changed every 14 days, although the label indicates that dressings should be changed every 7 days. In addition, the study noted that despite computerized randomization, the infants in the intervention group were significantly younger and had lower birth weight than the infants in the control group, and more were male. The Workgroup observed that the control group infection rate appears to be somewhat high and could possibly confound the study results.

The Khattak study was even smaller (N=50). It measured silver absorption in very low birth weight infants (VLBWI). The study reported a non-significant reduction in BSI rates among VLBWI: 12.34 versus 6.69 BSI per 100 line days. The BSIs were determined by blood cultures. The infection rates between the control and study groups were insufficient for statistical analysis. BSI was not cited as related to, or associated with, a catheter.

Both Khattak and Hill declared no conflicts of interest. Khattak noted that the manufacturer supplied the material for the study and was not involved in study design, analysis, or preparation of the manuscript.

Regarding the label claims for the product as a wound dressing, studies report no data that might support the label claims for absorption, wound healing, odor reduction, or preventing contamination. No instructions for use (IFU) or label claims could be found relating to use of the product as a catheter dressing.

The marketing data present the following basic science data:

- Survival curves for *MRSA*, *S. aureus*, and *Escherichia coli* (*E. coli*)
 - Survival curves are for wound patch/dressing
- Zone of inhibition data for *S. aureus* and *Pseudomonas aeruginosa* (*P. aeruginosa*)

Marketing data also refer to in vitro data from the paper comparing the efficacy of the silver impregnated IV dressings to the chlorhexidine-impregnated dressings. A survey of nurses indicating ease of use of the product is also described.

H. What evidence of safety or assessment of potential harms are available? Pre-market evidence? Post-market evidence?

While pre-market evidence of safety data was not available, the post-market evidence consists of the 2010 Khattak and Hill studies. Khattak noted significant differences in silver absorption between groups:

- Day 1: 0.22ng/ml (± 0.09) vs. 7.6 ng/ml (± 20.93); $p < 0.001$
- Day 7: 0.23 ng/ml (± 0.14) vs. 4.79 ng/ml (± 4.37); $p < 0.001$
- Day 28: 0.21ng/ml (± 0.07) vs. 3.19ng/ml (± 3.23); $p < 0.001$

The Khattak study notes that “Adult human toxicity appears to require approximately 13.3 mg/kg of silver to develop acute toxicity.” FDA has standards for toxicity in neonates, which may be different from adults, but it is not yet known what these standards are. The Khattak paper assumes that the detected absorption levels are safe, but breakpoints for safety in the NICU population are not known. The study also reported no adverse skin reactions and no changes in hepatic or renal function. Blood urea nitrogen (BUN) was not different between groups, implying no interference with protein metabolism or nitrogen fixation. No clinical change in central nervous system function was observed.

The Hill study reported no incidence of death associated with the silver alginate catheter dressing and also reported no adverse skin changes or other adverse events associated with the dressing in the treatment group. The study noted that use of the dressings did not alter the microbiology of PICC-associated BSIs.

I. What is the assessment of balance of harms vs. benefits?

The confidence in the evidence of benefit from these 2 RCTs is very low. Both studies were small and underpowered to detect a result for the secondary outcomes of infection. Further, infection measures were poorly defined in both studies. The reported BSIs were unrelated to the central line in the Khattak study, and PICC-related infection was undefined in the Hill study. There were significant differences between study group characteristics in the Hill study. Significant levels of silver absorption were reported, and it is unknown whether those levels are “safe” in neonates. It is likely that both studies were conducted in settings with high baseline infection rates.

J. Is it superior over established alternatives (standard of care)?

The silver alginate catheter dressing was implemented as a part of an existing “bundle” in both studies, so it cannot be determined whether it is superior to standard of care, as it was incorporated into the standard of care. The following differences were noted between the Khattak and Hill studies:

Different Sites

- Khattak: central line site
- Hill: PICC/peripheral site

Different Skin Prep Procedures

- Khattak: unclear whether the skin preparation was standard of care
- Hill: used current standard of care

Dressing Type: Combination Product

- Khattak: clear semi-permeable transparent dressing
- Hill: semi-permeable transparent dressing

Timeframes for Dressing Changes

- Khattak: 7 days
- Hill: 14 days

K. Is there a demonstrated impact when the product is used alone or as part of a bundle?

Both studies added the product to an existing central line standard of care. Khattak specified that this protocol was pre-existing hospital procedure. Both studies reported high baseline BSI rates for 2010, which affects confidence in the reported effect. Both studies were underpowered and reported non-significant reductions.

L. Are the findings generalizable to a product class at the time the evidence is reviewed?

The active ingredients of the product are antimicrobial ionic silver in a maltodextrin matrix coating a foam base. The mechanism of action is that silver is intended to prevent microbes from passing through the dressing during use, and maltodextrin is intended to aid in wound healing. The product design is a formulation of ionic silver combined in an alginate and maltodextrin matrix coating foam dressing.

Similar dressings are available, such as silver-impregnated or silver-coated dressings with a nylon base, but a recommendation about this product would not likely be applicable to them. If the findings are generalizable to a product class, they would likely only apply to products with a silver alginate and maltodextrin base on a foam dressing for use with intravenous catheters.

M. Does the evidence support generalizability across settings, environments, populations?

This node is not applicable, given that this review was conducted for a setting and population-specific analysis.

N. What are the resource implications?

Human

- Possibly minimal, as the dressing may not be a time-consuming step
- Nursing time to care for an infected infant factors into this consideration

Material

- Increased cost, but the cost is likely far less than the cost of a catheter-related BSI in a neonate

Education and Training

- Manufacturer's website describes a study on nursing education on product use conducted in adult units for 30 days
- Nurse satisfaction and compliance with dressing was high based on surveys and oral feedback

O. Does this assessment inform or support a recommendation?

- Both studies were conducted in NICUs, which is applicable to the population of interest
- Both studies evaluated the dressing as an addition to current standard of care, not as a replacement to any component of care
- Neither study demonstrated a significant reduction in a well-defined catheter-related infectious outcome
- Both studies were underpowered to detect a result despite the high baseline infection rate in both hospitals
- While the level of systemic silver absorption considered toxic in adults is known, the level considered toxic in neonates is not known

At the time of this review, the summary of benefits and harms analyzed in the retrieved evidence does not support a recommendation for use of this product solely for reduction of CLABSIs in neonates.

Next Steps

Dr. Chopra described the “lessons learned” from this implementation of the tool.

- It is difficult to find product labels.
 - Product labels are important in order to understand the context, setting, patients, sites, etc, in which these dressings were applied.
- Even though both studies examined harm, the harm “breakpoints” are unclear regarding toxicity levels for neonates and systemic silver absorption.
 - Absorption is also a concern and a potential harm associated with mupirocin.

The Workgroup will summarize its findings in a White Paper:

- Introduction
 - A standardized process that summarizes and outlines how evidence may be used to make recommendations for specific products had not previously been developed and used by HICPAC.
- Scope
 - This section will describe the criteria and processes for assessing products, noting the goal to add transparency to the process, not to evaluate specific products from industry.
- Methods
 - This section will describe the development and refinement of the worksheet to guide the review and evaluation process for novel infection control products.
- Summary
 - The process for development of infection prevention and control *practice* recommendations is sound, but the assessment of evidence associated with infection control *products* is less sound. This standardized approach will allow for a transparent and systematic approach for reviewing the evidence behind *products*.

HICPAC input will be incorporated into the tool and it will be posted on the HICPAC website.

HICPAC’s thoughts are welcome in these areas:

- What suggestions does HICPAC have given the difficulties encountered during the “test runs” on mupirocin and silver alginate catheter dressings?
- Should the nodes incorporate the standard of care when the evidence was collected?
 - For example, Node J of the silver alginate catheter dressing application of the tool
- If data are not available from the evidence, such as silver toxicity levels in neonates/infants versus adults, should the worksheet:
 - incorporate external data (look for external data that would help support the claim)?
 - only use the available data and quote the authors?
 - do something else?

Discussion Points

HICPAC Feedback

The worksheet is impressive and will add transparency and clarity to the recommendation development process.

The worksheet process has the potential to drive the way that products are approved, labeled, and tested.

It is important to capture the context within which a study was originally conducted, the standard of care at that time, and whether the standard of care was followed. If standard of care has

changed since the original study, the change should be acknowledged and explained as part of the worksheet, even if the change does not affect HICPAC's conclusions. Standard of care is often based on practice, not necessarily on evidence.

Toxicity and safety data in various populations are important, and a good-faith effort should be made whenever possible to present the information in the tool. If the assessment finds clear benefit, a decision can be made regarding whether to pursue the assessment further. The assessment should be thorough, using due diligence to understand potential harms, but if there is no evidence of substantial benefit, assessing additional harm may not be worth the effort.

Other members of HICPAC disagreed with the idea that harms should not be assessed if strong evidence of benefit is not found. The committee might make a recommendation to not use a product or implement a practice.

A 300-patient RCT for the product in the example is registered at the ClinicalTrials.gov website (www.clinicaltrials.gov), but results have not been reported. There was discussion regarding whether such trials would be noted in the assessment process, and regarding the interpretation of a trial that has not been published after several years of registration.

Dr. Chopra said that the process does not incorporate registered trials, noting that the Clinicaltrials.gov website (www.clinicaltrials.gov) describes pre-specified outcomes that will be evaluated by the trial, but not actual study outcomes. In some cases, data may be forthcoming, but some trials are never published. The next "test case" could include ClinicalTrials.gov information.

This tool can evolve over time as the field evolves. Additional issues are likely to come to light when other products are assessed, particularly regarding data quality – high baselines, small studies, etc – and whether a product was part of a bundle initiative.

There was discussion whether the committee will "err on the side of caution" in the absence of data, and how to be transparent about the conclusions that are reached. The worksheet only uses the available data.

This process may also be helpful for institutions with Value Analysis Committees that face questions about products in terms of risks, benefits, costs, and education.

The tool will also be beneficial for communication, such as for audiences that may not be experts in a particular field.

Ex officio and Liaison Representative Feedback

HICPAC invited FDA to provide input and perspective regarding the difficulty in finding label claims, and on how label claims are made available, updated, and changed.

FDA appreciates participating on HICPAC as an *ex officio* member and noted that the development of this tool has helped them. One of the examples in the tool was shared with FDA's post-marketing group for feedback. The agency cannot monitor every product, device, and medication placed on the market; rather, trade complaints are often the catalyst for further action. If an FDA label cannot be found, it means that the agency has not approved the item for that use. FDA appreciates that CDC and HICPAC are doing this work before making recommendations.

General Responses/Observations

Ms. Stone said, in response to a question about the time required to complete the worksheet, that the process was time-consuming but not onerous. Including revisions it took perhaps a week to finalize the worksheet. The process will likely move more quickly as the tool becomes more familiar and as refinements are made.

Dr. Chopra added that the time commitment will increase according to the number of relevant studies that are retrieved. HICPAC will have to be selective and thoughtful when considering which products to evaluate.

The Products and Practices Workgroup did not intend this worksheet to be applied to existing guidelines. The Workgroup was tasked with developing a tool that could be used in future guideline development processes, not to conduct ongoing product evaluations.

Dr. Bell thanked the Workgroup for the effort and thought that was devoted to developing this worksheet. He commented on the clarity, rigor, and intellectual honesty that this approach provides. The worksheet and the white paper will help industry colleagues understand the quality of evidence that is expected, and that user feedback from one of the studies cited on the manufacturer website was considered. This work is a move toward efficiently addressing the increasing numbers of these types of products.

Dr. Cardo thanked the Workgroup for developing this excellent approach. HICPAC will see more and more products and practices for which RCT evidence is not available, but that will be used in the field. In their ongoing work to prevent infections and protect patients, it is important to remember that not making a recommendation because of a lack of a process for making one can be problematic. This worksheet brings additional perspective. The process is clear, and it will improve over time. This work represents a major step forward and is an important way that HICPAC can provide practical advice.

Guideline for Infection Prevention in NICU Patients Workgroup Update

Kristina Bryant, MD

Chair, Guideline for Infection Prevention in NICU Patients Workgroup

Dr. Bryant presented an update from the *Guideline for Infection Prevention in NICU Patients Workgroup* (“NICU Guideline Workgroup”) on:

- *S. aureus* Key Question reorganization and draft recommendations;
- CLABSI;
- Respiratory illness; and
- *Core Practices for the NICU*, a new project that arose from the Workgroup’s work on *S. aureus*.

S. aureus

Dr. Bryant presented the original Key Questions for the *S. aureus* section of the Guideline:

- 1.1.** What are the risk factors for endemic *S. aureus* infection in NICU patients? Do these factors differ between MRSA and methicillin-sensitive *S. aureus* (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?
- 2.** Which anatomic sampling sites and laboratory assays most effectively identify *S. aureus* colonization in NICU patients?
- 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?

The Workgroup decided to simplify the Key Questions and to reorganize them so that the first question focuses on effective strategies for *S. aureus* prevention:

- 1.A.** What are 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?
- 1.B.** If active surveillance is conducted, which anatomic sampling sites and laboratory assays most effectively identify *S. aureus* colonization in NICU patients?
- 2.A.** What are the risk factors for *S. aureus* infection in NICU patients? Do these factors differ between MRSA and MSSA or in the setting of an outbreak?
- 2.B.** What are the risk factors for *S. aureus* colonization in NICU patients? Do these factors differ between MRSA and MSSA or in the setting of an outbreak?

The literature review for Key Question 1.A identified 15 observational studies for analysis. The studies selected for inclusion examined interventions of any kind (single or multi-strategy) and provided a clear description of the intervention(s), as well as a statistical analysis comparing time points before and after the intervention(s). Nine studies assessed multiple intervention strategies, 2 assessed single intervention strategies, 10 examined active surveillance testing to guide implementation of infection prevention and control measures, and 4 examined infant decolonization. These strategies are not mutually exclusive; for instance, some of the multi-intervention strategies incorporated active surveillance testing in addition to other interventions.

For Key Question 1.B, the literature review identified 5 diagnostic studies. In order to be included in the analysis, studies of *S. aureus* test performance had to report test characteristics (eg, sensitivity, specificity, positive predictive value). Three of the studies assessed optimal testing strategies, and 2 examined the optimal site for sampling.

A proposed framework for categorizing HICPAC recommendations was presented at HICPAC's February 2018 teleconference. The framework includes a recommendation statement accompanied by a justification table with several elements. The NICU Workgroup was charged with applying this new framework to the draft recommendations:

- 2.1.A.1.** Perform active surveillance testing for *S. aureus* in neonatal intensive care unit patients when there is an increased incidence of *S. aureus* infection or in an outbreak setting.
(Recommendation)

Supporting Evidence: The evidence supporting this recommendation consists of 10 observational studies reporting overall reductions in the outcomes of *S. aureus*, MRSA, or MSSA infection, colonization, or transmission. Transmission is a composite outcome of infection and colonization. (Delaney, Farrington, Geraci, Gill, Jernigan, Kaushik, Milstone, Popoola, Wisgrill, Voskertchian)

Level of Confidence in Evidence: The level of confidence in this evidence is low because observational studies are considered at higher risk of bias than randomized controlled trials.

Benefits: The benefits that would result from implementing this intervention are a reduction in *S. aureus* infection, colonization, and transmission that would result from facility implementation of strategies targeting patients identified by active surveillance testing.

Harms: Harms that could result from this recommendation include minor patient discomfort from performing nasal swabs. Identification of some infants with methicillin-resistant *S. aureus* colonization may result in the institution of Contact Precautions, which has inconsistently been associated with unintended consequences, such as decreased healthcare worker

contact, in other populations. This literature search did not retrieve data suggesting harm from use of Contact Precautions in NICU populations.

Resource Use: Implementing active surveillance testing would result in increased human and material costs, however it is anticipated that these costs will be less than the cost of invasive *S. aureus* infections in this vulnerable population that could be prevented by subsequent implementation of additional infection prevention strategies.

Balance of Benefits and Harms: There is a preponderance of benefit over harm for active surveillance testing for *S. aureus*.

Value Judgments: Infection prevention, patient safety, and outbreak management in this high-risk population were all considered in the formulation of this recommendation.

Intentional Vagueness: The term *S. aureus* includes both MSSA and MRSA. An increased incidence of *S. aureus* infection may include a cluster of *S. aureus* infections or an increase in the endemic incidence of *S. aureus* infection compared to historical data from the unit or the published literature.

Exceptions: There are no exceptions to this recommendation.

2.1.A.2. Perform active surveillance testing for MRSA colonization in neonatal intensive care unit patients when there is evidence of ongoing healthcare-associated transmission within the unit. **(Recommendation)**

Supporting Evidence: The evidence supporting this recommendation consists of five observational studies reporting the outcomes of MRSA infection, colonization, or transmission. Transmission is a composite outcome of infection and colonization. (Farrington, Geraci, Jernigan, Kaushik, Milstone)

Level of Confidence in Evidence: The level of confidence in this evidence is low because observational studies are considered at higher risk of bias than randomized controlled trials.

Benefits: Implementation of active surveillance testing for MRSA will result in the implementation of infection control strategies that will result in a reduction in MRSA colonization and infection when there is evidence of ongoing healthcare associated transmission.

Harms: Harms that could result from this recommendation include minor patient discomfort from performing nasal swabs. Identification of some infants with methicillin resistant *S. aureus* colonization may result in the institution of contact precautions, which has been associated with harms in other populations. This literature search did not retrieve data suggesting harm from use of Contact Precautions in the NICU populations.

Resource Use: Implementing active surveillance testing for MRSA would result in increased human and material costs; however, it is anticipated that these costs will be less than the cost of possible MRSA infections in this vulnerable population that could be prevented by subsequent infection prevention strategies.

Balance of Benefits and Harms: There would be a greater benefit than harm if this recommendation is followed.

Value Judgments: Values considered in the formulation of this recommendation include patient safety and resource considerations.

Intentional Vagueness: Healthcare-associated transmission within the unit is suggested by an increase in cases of MRSA colonization or infection determined by cultures obtained for clinical indications.

Exceptions: This recommendation only applies to MRSA.

2.1.A.3. The use of active surveillance testing for MSSA colonization in neonatal intensive care unit patients to detect ongoing healthcare-associated MSSA transmission is an unresolved issue. **(No Recommendation)**

Supporting Evidence: No evidence was retrieved evaluating the use of active surveillance testing to prevent transmission of MSSA colonization.

Level of Confidence in Evidence: This criterion is not applicable if there is no evidence.

Benefits: If a facility implements active surveillance testing for MSSA, it is likely that interventions implemented to reduce MSSA transmission would result in a decrease in MSSA infections.

Harms: If facilities choose to conduct active surveillance for MSSA colonization, there may be minor patient discomfort from performing nasal swabs.

Resource Use: There would be no additional resource use if facilities choose not to conduct active surveillance for MSSA. However, if facilities choose to conduct active surveillance for MSSA to implement interventions to reduce MSSA infection and colonization, there would be increased human and material costs.

Balance of Benefits and Harms: MSSA is pathogenic and can cause invasive infections, however colonization with MSSA is common in the NICU setting. At this point, it is not clear that conducting active surveillance for MSSA colonization will lead to subsequent interventions that will reduce MSSA transmission, so the resource cost may outweigh the benefit. However, recent studies suggest that ASC may lead to subsequent interventions that can decrease MSSA infections.

Value Judgments: Values considered in the formulation of this recommendation include the supporting evidence, patient safety, and resource considerations.

Intentional Vagueness: Healthcare-associated transmission within the unit is suggested by an increase in cases of MSSA colonization or infection determined by cultures obtained for clinical indications.

Exceptions: This recommendation only applies to MSSA.

2.1.A.4. If active surveillance testing for *S. aureus* colonization is implemented for neonatal intensive care unit patients, test routinely to promptly identify newly colonized patients. **(Recommendation)**

Supporting Evidence: The evidence supporting this recommendation consists of 10 observational studies. (Delaney, Geraci, Farrington, Jernigan, Kaushik, Milstone, Popoola, Ristagno, Voskertchian, Wisgrill)

Level of Confidence in Evidence: The level of confidence in this evidence is low because observational studies are considered at higher risk of bias than randomized controlled trials.

Benefits: Implementation of routine active surveillance testing will enable facilities to identify colonized patients promptly and guide implementation of appropriate infection prevention and control measures to reduce person-to-person transmission.

Harms: There may be minor discomfort from performing nasal swabs in NICU patients.

Resource Use: The frequency of testing will directly affect the costs, including human resources and laboratory resources.

Balance of Benefits and Harms: There is a preponderance of benefit over harm if this recommendation is implemented.

Value Judgments: Values considered in the formulation of this recommendation include patient safety and resource considerations.

Intentional Vagueness:

- The frequency for active surveillance testing is noted as “routinely” to allow facilities to sample weekly, or more or less frequently depending upon the facility’s baseline rates of colonized and infected patients, or as the unit epidemiology changes.
- The addition of admission testing in combination with routine testing is best determined by the facility.

Exceptions: There are no exceptions to this recommendation.

2.1.A.5. If active surveillance testing for *S. aureus* colonization in neonatal intensive care unit patients is implemented, consider testing outborn infants or infants transferred from other newborn care units on admission to promptly identify newly admitted colonized patients.

(Conditional Recommendation)

Supporting Evidence: The evidence supporting this recommendation consists of five observational studies. (Delaney, Ristagno, Milstone, Popoola,, Voskertchian)

Level of Confidence in Evidence: The level of confidence in this evidence is low because observational studies are considered at higher risk of bias than randomized controlled trials. Additionally, three of the five studies supporting this recommendation are published by the same facility, potentially limiting the applicability of these results.

Benefits: If a facility implements this recommendation, due to higher endemic rates in the outborn population, a reduction in *S. aureus* colonization and infection could be seen.

Harms: There may be minor discomfort from performing nasal swabs in NICU patients.

Resource Use: Implementing this recommendation would result in increased material and human resource costs.

Balance of Benefits and Harms: Implementing this recommendation would result in a balance of benefit and harm in situations where the difference in outborn and inborn colonization rates are minimal. There is a greater likelihood of benefit in situations where outborn and transferred infants have a higher *S. aureus* colonization rate.

Value Judgments: Values considered in the formulation of this recommendation include patient safety and economic and human resource costs.

Intentional Vagueness:

- Benefits have also been seen in the literature in testing all neonates on admission. The recommendation specifies outborn infants or transferred infants because there was slightly greater benefit seen in this population in the literature. Units can consider their own unique epidemiologic needs when deciding the optimal population to test on admission.
- *S. aureus* includes MRSA and MSSA.

Exceptions: There are no exceptions to this recommendation.

2.1.B.1. If active surveillance for *S. aureus* colonization in neonatal intensive care unit patients is performed, use culture-based or polymerase chain reaction detection methods.

(Recommendation) (See Implementation Considerations).

Supporting Evidence: The literature search retrieved three diagnostic studies which support this recommendation. (Frances, Paule, Sarda)

Level of Confidence in the Evidence: The overall confidence in this evidence is moderate due to imprecision in the estimate of effect.

Benefits: If the recommendation is followed, facilities would be able to select the laboratory assay that best fits facility considerations and the needs at hand. This is because, while marginal, polymerase chain reaction (PCR) offers increased sensitivity over culture for detecting *S. aureus*, yet culture has the advantage if there is an isolate available for molecular typing and susceptibility tests.

Harms: PCR is more sensitive for detection of *S. aureus* and offers a small additional benefit over culture. PCR can have a more rapid turnaround depending on lab capabilities; however, it has a lower specificity for detecting MRSA. While the workgroup concluded that culture is not likely to miss detecting a large number of *S. aureus* colonized infants, the possibility exists that culture may result in a small number of *S. aureus*-colonized infants not being identified.

Resource Use: PCR is more expensive than culture.

Balance of Benefits and Harms: There is a benefit to using PCR vs. culture-based methods to detect *S. aureus* colonization, but this benefit is offset by important considerations. The sensitivity of PCR is slightly higher, but facilities should balance performance characteristics of the test, clinical management considerations, susceptibility testing, facility volume, outbreak identification, and test turnaround time when choosing an assay, as outlined above.

Value Judgments: Value judgements include, test characteristics and availability, outbreak management, unit volume, economic considerations, need for a full susceptibility panel, speed of test turnaround, and resource utilization.

Intentional Vagueness: The term *S. aureus* includes MRSA and MSSA.

Exceptions: There are no exceptions to this recommendation.

Implementation Considerations

Although PCR may have higher sensitivity, multiple considerations influence which test a facility may use to screen for *S. aureus* colonization. These include, but are not limited to, outbreak identification; turnaround time; performance characteristics of the test; clinical management; the number of specimens combined with the capabilities of the laboratory providing the service; and resource utilization. Depending on laboratory capacity, molecular diagnostic testing methods such as PCR may be more useful in circumstances such as identifying an outbreak when there may be an increased volume of cultures to process and a faster turnaround time is needed. However, culture-based methods provide the benefit of lower cost and capturing specific susceptibility patterns to optimize patient treatment. Facilities and providers can balance these situation-specific needs to select the assay that best benefits their NICU patients.

2.1.B.2. If active surveillance for *S. aureus* colonization of neonatal intensive care unit patients is performed, collect samples from at least the anterior nares of neonatal intensive care unit patients. **(Recommendation) (See Implementation Considerations).**

Supporting Evidence: The literature search identified two diagnostic studies which support this recommendation. (Huang, Singh)

Level of Confidence in the Evidence: The level of confidence in this evidence is moderate due to inconsistent results across studies.

Benefits: The sensitivity of the anterior nares has the highest yield of the anatomic sites for identifying *S. aureus* colonization.

Harms: There may be minor discomfort from performing nasal swabs in NICU patients. However, if neonates are not colonized in the anterior nares, and only the nares are sampled, then the colonization of that neonate at another anatomic site may be missed.

Resource Use: There is increased cost, and use of laboratory and human resources associated with sampling more than one site.

Balance of Benefits and Harms: There is a preponderance of benefit over harm: The anterior nares is the most sensitive anatomic site for identifying colonized with *S. aureus* colonization; however, there are some infants colonized at sites other than the anterior nares and those infants would be missed if only the nares are sampled. There is no patient level harm associated with sampling to axilla, rectum, or umbilicus. There is only the additional resource utilization and cost. While collecting samples from additional sites to the anterior nares increases sensitivity, it is not clear that the additional sites will have a meaningful impact on outcome or that the additional costs are warranted.

Value Judgments: Value judgements include test characteristics and resource utilization. Intentional vagueness: The term *S. aureus* includes MRSA and MSSA. "At least" is left intentionally vague to allow providers to determine alternate sampling sites.

Exceptions: There are no exceptions to this recommendation.

2.1.B.2.a. Consider also collecting samples from the axilla, rectum, and umbilicus to increase yield. **(Conditional Recommendation) (See Implementation Considerations).**

Supporting Evidence: The literature search identified two diagnostic studies which support this recommendation (Huang, Singh)

Level of Confidence in the Evidence: The level of confidence in this evidence is moderate due to inconsistent results across studies.

Benefits: The yield from collecting samples from additional sites offers an incremental increase in sensitivity. During outbreak settings with a highly virulent strain, sampling additional sites might provide greater benefit.

Harms: There may be minor discomfort from performing nasal swabs in NICU patients. However, if neonates are not colonized in the anterior nares, and only the nares are sampled, then the colonization of that neonate at another anatomic site may be missed.

Resource Use: There could be increased costs associated with running multiple assays (these costs include time, financial, human, and material resources).

Balance of Benefits and Harms: The benefit is possible but may not outweigh the costs and resources required. The benefit of testing additional sites may strengthen in periods in which increased sensitivity is needed, such as during an outbreak.

Value Judgments: Sampling additional sites could increase the sensitivity of detection.

Intentional Vagueness: The term *S. aureus* includes MRSA and MSSA.

Exceptions: There are no exceptions to this recommendation.

Implementation Considerations

The available evidence suggests that the nares demonstrate higher sensitivity to detect MRSA in NICU patients. To increase the sensitivity of assay results, providers can sample at least two sites in NICU patients. If additional sites are desired, use the test that has been validated for the

site to be sampled. In general, testing and sampling strategies that apply to MRSA also apply to MSSA, however future research may provide greater insight.

2.1.C.1. Consider targeted decolonization therapy for *S. aureus*-colonized neonatal intensive care unit patients in an outbreak setting, or when there is on-going healthcare associated transmission, or an increase in the incidence of infection, in addition to the implementation of and adherence to appropriate infection prevention and control measures. **(Conditional Recommendation)**

Supporting Evidence: The evidence supporting this recommendation consists of three observational studies. (Huang, Popoola, Voskertchian)

Level of Confidence in the Evidence: The level of confidence in this evidence is low because observational studies are considered at higher risk of bias than randomized controlled trials. Two of these studies were performed in a single center NICU population.

Benefits: Implementing decolonization therapy can result in a reduction in the *S. aureus* colonization rate of NICU patients, which then results in a reduction in *S. aureus* transmission and infection in NICUs.

Harms: Harms resulting from the implementation of this recommendation include significant systemic absorption of decolonizing agents, increased resistance to the decolonizing agent and adverse skin reactions.

Resource Use: Implementing this recommendation will result in increased material and human resource costs.

Balance of Benefits and Harms: The reduction in *S. aureus* colonization is balanced by concern for the development of antimicrobial resistance, antiseptic resistance, cross-resistance, and safety concerns due to significant systemic absorption of decolonization agents seen in this population.

Value Judgments: Values considered in the formulation of this recommendation include patient safety, antimicrobial stewardship and resistance concerns, federal regulatory approvals, and resource utilization. Intentional vagueness: While colonized NICU patients are the most frequently targeted population for decolonization, the optimal population to target is left for the facility to determine.

Exceptions: There are no exceptions to this recommendation.

2.1.C.2. The use of universal decolonization therapy in *S. aureus*-colonized neonatal intensive care unit patients is an unresolved issue. **(No Recommendation/ Unresolved Issue)**

Supporting Evidence: The evidence supporting this recommendation consists of 2 observational studies. (Ristagno, Wisgrill)

Level of Confidence in the Evidence: The level of confidence in this evidence is low because observational studies are considered at higher risk of bias than randomized controlled trials.

Benefits: There could be a reduction of *S. aureus* colonization and infection rates in NICU patients if universal decolonization therapy was implemented.

Harms: Harms include significant systemic absorption of decolonizing agents, and adverse events from the agent chosen for decolonization therapy. There is a greater concern for an increase in resistance to decolonizing agents if decolonization therapy is less discriminate in its application.

Resource Use: If this recommendation were followed, resource use would change from lab costs to treatment costs, which, in some cases may increase, or decrease overall resource use.

Balance of Benefits and Harms: Universal decolonization may be more feasible and easier to implement, but would have unclear additional benefit beyond targeted decolonization therapy. There is a greater concern over the evolution of harms such as resistance to the decolonizing agent if it is applied broadly to an entire population in a unit.

Value Judgments: Values incorporated into the formulation of this recommendation include patient safety, antimicrobial stewardship and resistance concerns, federal regulatory approvals, and resource utilization.

Intentional Vagueness: There is no intentional vagueness in this recommendation.

Exceptions: There are no exceptions to this recommendation.

2.1.C.3. The optimal decolonization agent and/ or combination of agents remains an unresolved issue. **(No recommendation/unresolved issue)**

Supporting Evidence: The evidence supporting this recommendation is approved labels from the US Food and Drug Administration, and 5 observational studies. (Huang, Popoola, Ristagno, Voskertchian, Wisgrill)

Level of Confidence in the Evidence: This evidence is regulatory and low quality evidence because observational studies are at higher risk of bias than randomized controlled trials.

Benefits: A reduction is seen in *S. aureus* infection and colonization when intranasal decolonization is implemented, alone or in combination with antiseptic, in addition to the implementation of core infection prevention and control practices.

Harms: The safety and efficacy of intranasal mupirocin is not established in ages less than 12 years of age. Additionally, in neonates and premature infants, significant systemic absorption occurred following intranasal administration. Topical chlorhexidine is cautioned for use with care in this population as well. The evidence retrieved by this analysis did not analyze systemic absorption. The harms of these decolonizing agents retrieved by this analysis include the development of resistance to the antiseptic or antibiotic agent, the development of cross-resistance, and the possibility of adverse skin reactions.

Resource Use: Implementation of decolonization therapy would result in increased material and human resource costs.

Balance of Benefits and Harms: The harms include significant systemic absorption, the development of resistance or cross resistance, and topical reactions and the balance of these harms with the benefits is unclear.

Value Judgments: Values included in the formulation of this recommendation include federally approved labels, patient safety, antimicrobial stewardship, and resistance concerns, and resource utilization.

Intentional Vagueness: This recommendation does not specify a specific decolonization therapy because no single FDA-approved decolonization therapy has been consistently proven effective and safe in this population.

Exceptions: There are no exceptions to this recommendation.

2.1.C.4. Appropriate procedures to allow discontinuation of Contact Precautions is an unresolved issue for individual neonatal intensive care unit patients who have a history of colonization or infection with MRSA. **(No Recommendation)**

Supporting Evidence: No evidence was retrieved which could be used to formulate a recommendation.

Level of Confidence in the Evidence: This criterion is not applicable if no evidence was retrieved
Aggregate evidence quality: For patients with a history of *S. aureus* colonization or infection, continuing Contact Precautions for the duration of hospitalization can prevent transmission of *S. aureus* from patients with recurrent colonization.

Harms: Even after decolonization, neonates can have recurrent colonization. Early discontinuation of Contact Precautions for patients with a history of colonization or infection can contribute to increased transmission of *S. aureus*. Contact Precautions have inconsistently been associated with unintended consequences, such as decreased healthcare worker contact, in other populations. This literature search did not retrieve data suggesting harm from use of Contact Precautions in NICU populations.

Resource Use: Implementation of Contact Precautions contributes to increased material and human resource costs.

Balance of Benefits and Harms: There would be a preponderance of benefit over harm, but this literature search retrieved no data to support a specific protocol by which to discontinue Contact Precautions (eg, discontinue Contact Precautions after multiple negative cultures).

Value Judgments: Value judgements used in the formulation of this recommendation include patient safety, familial bonding, local baseline colonization rates, and economic and human resource considerations.

Intentional Vagueness: There is no intentional vagueness in this recommendation.

Exceptions: There are no exceptions to this recommendation.

Regarding Key Question 2, Dr. Bryant noted that while risk factors were identified for *S. aureus* infection and for MRSA colonization, most of them were non-modifiable. For instance, *S. aureus* colonization is a risk factor for *S. aureus* infection, and premature VLBWI are at risk. The Workgroup determined that these demographic risk factors are worthy of further inquiry and could warrant the implementation of targeted interventions. The literature search did not retrieve evidence examining interventions for specific use in NICU patients at higher risk for *S. aureus* infection or colonization. The literature search also did not retrieve evidence targeting the optimal interventions to reduce *S. aureus* transmission specifically in NICU patients at higher risk of *S. aureus* infection or colonization. Therefore, the Workgroup could not make actionable recommendations in these areas and the risk factor information will be summarized in the text of the Guideline. In clinical settings, it is important to recognize higher-risk infants. Information about risk factors could inform future studies to examine interventions for these populations.

The next steps for this section of the Guideline are Workgroup review and incorporation of HICPAC feedback and, if HICPAC approves the draft *S. aureus* recommendations, proceed with co-author approval, CDC clearance, and publication for public comment.

CLABSI

Dr. Bryant presented the Key Question for the CLABSI section of the Guideline:

What are effective strategies to prevent CLABSI in neonatal intensive care unit patients?

The literature search retrieved 168 studies that were selected for inclusion; additionally, 72 studies included from the original 2012 literature search are under review to ensure that they fit the updated inclusion and exclusion criteria, as the original literature search included not only

NICU infants, but also infants under one year of age. Currently, 96 articles are pending extraction.

No new evidence since 2012 was retrieved for the following intervention categories:

- Closed Medication Systems
- Silver Alginate Dressing
- Filtered vs. Non-Filtered Catheters
- Systemic Prophylaxis
 - Antimicrobial
 - Anticoagulant
- Central Line Antimicrobial Locks

Studies since 2012 have been retrieved in the following intervention categories, illustrating the volume of work occurring in these areas:

- Multi-Intervention Strategies, Bundles, and Checklists: 25
- Catheter Site: 6
- Catheter Type: 11
- Catheter Duration: 2
- Catheter Manipulation: 2
- Catheter Tip Placement: 5
- Insertion Technique: 2
- Skin Antisepsis: 3
- Line Maintenance: 2 (eg, catheter hub antisepsis)
- Chlorhexidine Adverse Events: 34
- Other: 4 (eg, compliance measures; probiotic use)

The next steps for the CLABSI section of the Guideline are: Workgroup review of the 2012 analysis and draft recommendations; extraction of the newly-retrieved articles; construction of GRADE (Grading of Recommendations, Assessment, Development and Evaluation) tables; and development of the draft recommendations and narrative.

Respiratory Illness

The final section of the *NICU Guideline* addresses respiratory illness in the NICU with one Key Question:

What are effective strategies to prevent respiratory illness in NICU patients?

The 2012 extraction tables for this section have been updated, and 23 articles have been selected for inclusion. The updated literature search retrieved 557 studies for title and abstract screening. Of those, 112 studies were selected for full text review. The next steps for this section are to conduct the full text review and extract and analyze the studies.

Core Practices for the NICU

Dr. Bryant reminded HICPAC that when the Workgroup initially presented draft recommendations for *S. aureus*, the first draft recommendation generated robust discussion:

2.1.A.1. (Original Draft Recommendation) Implement core infection prevention and control strategies to prevent *S. aureus* transmission in neonatal intensive care unit patients. These strategies are hand hygiene, Standard Precautions, environmental cleaning, healthcare personnel education and training, and reinforcing implementation of and monitoring adherence to these strategies as outlined in *Core Infection Prevention and Control Practices for Safe Healthcare*

Delivery in All Settings – Recommendations of the HICPAC (2017), and detailed in the respective guidelines. In addition to these strategies, implement Contact Precautions for MRSA-colonized or –infected infants. **(Recommendation)**

When the draft recommendation was presented, HICPAC commented that all of the named strategies are in the *Core Practices* document and do not need to be restated in this Guideline. Discussion also focused on the preferred terminology for “auditing” or “monitoring adherence to strategies.”

As the *NICU Guideline* will be used by a broad audience that might not be familiar with the *Core Practices* document (eg, front-line neonatologists, community hospitals without a full-time Infection Preventionist or Hospital Epidemiologist), the Workgroup has struggled with the question of how to incorporate important elements of the *Core Practices* document into the *NICU Guideline* without repeating them, and how to point to Core Practices that are specific to the NICU setting. Ms. Fauerbach has led this charge, culling through HICPAC publications for recommendations and guidance related to the NICU, and identifying areas where the Workgroup might need to expand on the *Core Practices* document for NICU populations. Examples of NICU-specific practices that are not necessary fully addressed in the *Core Practices* document include:

- Education for family members and visitors
- Recommendations on surveillance of high-risk populations
- Hand hygiene appropriate to procedure performed
- Specific environmental recommendations (laundry, phenolics, isolette cleaning)
- Visitor screening

In closing, Dr. Bryant posed the following questions for HICPAC’s consideration:

- What other NICU-specific Core Practices need to be added to this list?
- What do you think about the concept of a *NICU Core Practices* document, and what should it include?
- What is an ideal format for the *NICU Core Practices* document? One approach could be to present the *Core Practices* in a column, with additional columns stating considerations specific to NICU patients. Another approach could be to refer to the *Core Practices* document and to describe additional Core Practices for NICUs.

Discussion Points

S. aureus Update

HICPAC Feedback

HICPAC expressed gratitude for the work and meticulous effort and care that went into drafting the recommendations. The new structure and evidence table are clear and provide transparency regarding how the recommendations are structured and worded.

Regarding Draft Recommendation 2.1.B.2., HICPAC asked about the rationale for adding 2.1.B.2.a. to “consider also collecting samples from the axilla, rectum, and umbilicus” when Recommendation 2.1.B.2. is to “collect samples from at least the anterior nares,” with additional sites described in the Justification Table.

Dr. Bryant replied that when the Workgroup began drafting recommendations, they intended to capture all of the evidence, hoping to offer guidance regarding when to consider sampling additional sites. With the new Justification Tables, it may be reasonable to note under “Intentional Vagueness” in 2.1.B.2. that sampling additional sites may increase sensitivity and would be appropriate.

HICPAC noted that these points are incorporated into the Implementation Considerations.

This section's initial focus was only on MRSA. The focus has since expanded to incorporate all *S. aureus*. Calling out specific practices for MRSA and recognizing increased risk is beneficial. The section balances MRSA with issues that are relevant to all *S. aureus*. MSSA causes substantial morbidity in NICU patients and in some NICUs may be more common than MRSA.

If all of the pertinent information is captured in the Justification Tables, especially within "Intentional Vagueness," the Implementation Considerations section may not be necessary. With this approach, the information is consistently all in one place.

Over the years, HICPAC has made important recommendations, but there has been confusion regarding how to implement them, and some are not implemented at all. Regardless of where the points are captured, there was support for describing "Implementation Strategies" or "Implementation Considerations" to help users apply the recommendations.

The *Core Practices* document includes a category on performance monitoring and feedback and emphasizes the importance of monitoring interventions that are implemented. In general, the goal has been for each guideline to reference the *HICPAC Core Practices* document.

Dr. Bryant noted that the narrative is structured such that each draft recommendation is immediately followed by its justification table. Only the diagnostic questions have the "Implementation Considerations." The Workgroup's goal is to highlight these considerations and to make the Guideline user-friendly. Further refinement can occur as the section moves forward.

Ex officio and Liaison Representative Feedback

The Pediatric Infectious Disease Society (PIDS) applauded the Workgroup for crafting recommendations in a way that allows individual facilities to make adaptations based on local rates and local characteristics of their NICUs. There are many differences among NICUs, and even hospital systems see differences among their individual hospitals' NICUs. Allowing for these differences will be helpful when the Guideline is used and interpreted. It will be important to provide guidance for discontinuation of Contact Precautions for these infants; it is hoped that future studies will be conducted in this area, which is a challenge, especially when patients are transported to different hospitals within and between systems.

Dr. Bryant indicated that the HICPAC Workgroup was unable to make a recommendation pertaining to Contact Precautions due to a lack of evidence. However, their partners at the Society for Healthcare Epidemiology of America (SHEA) are developing companion documents that may be able to address this, and other, important questions.

The Council of State and Territorial Epidemiologists (CSTE) indicated that one of the Council for Outbreak Response: Healthcare-Associated Infections and Antibiotic-Resistant Pathogens (CORHA) Workgroups is focused on improving the identification, detection, and reporting of outbreaks, as well as outbreak investigation. *S. aureus* thresholds have not been determined for NICUs. CSTE supported the structure of the *NICU Guideline* and the inclusion of both MSSA and MRSA. This Guideline will dovetail with CORHA's work. Even though only observational studies are available, the Guideline takes good advantage of them to offer the best possible recommendations to guide practice.

CSTE commented on the term "active surveillance" versus the word "screening." CSTE has considered this terminology as part of their definitions. CSTE used to use "active surveillance testing (AST)" and has now moved to "screening," in part because the abbreviation "AST" is potentially confusing because it can be used for "antimicrobial susceptibility testing." The term "screening" may have to be introduced as "also known as active surveillance testing" for clarity.

In terms of guideline implementation, CSTE commented on the important concept of auditing whether a facility has actually implemented what it thinks it has implemented. Auditing has been a key component of Tennessee's work to reduce its rates of hospital-onset MRSA BSI. Though the resource burden is high, a 70% reduction has been achieved in 12 months. Some facilities thought that chlorhexidine bathing had been implemented, but auditing revealed that it had not. This concept is important across all interventions, but may be helpful to note in the *NICU Guideline*.

CSTE commented on the importance of engaging with hospital leadership. In Tennessee, State Health Department collaboration with the Tennessee Hospital Association has boosted engagement across the state. The collaboration has also led to the creation of recommendations that are then endorsed and disseminated to hospital leadership. This approach adds weight to recommendations. A similar model could be applied in other jurisdictions.

General Responses/Observations

Dr. Cardo emphasized that while *S. aureus* is an important target for prevention, it is important not to imply that MRSA, which continues to pose a major challenge, is less of a concern. Users should elevate all infections. This document could provide examples of what constitutes an outbreak.

Dr. Cardo commented on the caveats in the draft Guideline regarding decolonization, noting the importance of better understanding the skin microbiome. DHQP is working with hospitals using the Targeted Assessment for Prevention (TAP), which is funded by CMS, to help facilities assess their units to determine how many infections need to be prevented to meet specific goals. While not part of this Guideline, this approach could be applied to the NICU, encouraging the use of unit data and considering how to create specific tools for this population and setting.

CLABSI Update

CSTE wondered about opportunities to recommend examining the number of CLABSIs that need to be prevented in order to reach HHS goals. The national HHS action goal is an SIR of 0.5: a facility may not be able to calculate an SIR, but it can determine the number of excess infections.

HICPAC commented that this potential addition is interesting, but that they had moved away from this approach because the assumed target was elimination, as opposed to stating a tangible number of infections to serve either as a goal or as an "acceptable" number, depending upon the paradigm.

Dr. Cardo emphasized the goal to prevent as many infections as possible. Past goals were infection rates; now, prevention goals are helpful from the perspective of specific infections in units, rather than rates. Similar approaches are applied for dialysis. Facilities are encouraged to achieve HHS national goals or facility goals and to continue to assess progress, versus simply being encouraged to reduce rates. This approach moves toward elimination because if infections are not prevented, it is important understand why. These concepts and tools could be provided to help facilities identify what is occurring, and to prevent those infections.

Some HICPAC members supported the idea, but agreed that specific data should not be included to avoid "dating" the Guideline. Information could be provided on how to calculate and determine rates. Many hospitals are working in this area, and some struggle with how to compare their current performance to their performance over time, as well as to the nation.

Core Practices for NICUs

There was some support from HICPAC for the option not to restate elements of the *Core Practices* document, but rather to refer to the document and to describe additional Core Practices for the NICU setting. In the digital age, it is not necessary to reiterate the original practices in a document of *Core Practices for the NICU* if links to the reference document are provided.

Other documents describing core practices, including from WHO, the United Kingdom (UK), and other countries, refer to the CDC *Core Practices* document by name.

HICPAC observed possibilities for other Core Practice documents for other special populations, such as bone marrow or solid organ transplant patients.

The updated Healthcare Personnel Guideline will link and refer to the *Core Practices* document.

HICPAC pointed out that the *Core Practices* document was intended to be applicable across multiple categories.

The American Academy of Pediatrics (AAP) Perinatal Guidelines include information about jewelry and other topics that may not be addressed in the HICPAC document. NICU Directors may be confused when they see guidelines from both AAP and HICPAC.

Ms. Stone said that to avoid the perception of endorsement, rather than referring to other guidelines directly, the *Guideline for Prevention of Surgical Site Infections (2017)* indicates that guidance exists elsewhere and notes the references. The NICU Guideline could make a similar statement, or could restate the guidance and cite the applicable reference.

Suggested additions to the list of NICU-specific practices that are not necessarily fully addressed in the *Core Practices* document:

- Cleaning of staff and visitor cell phones
- Management of breast milk and preparation of formula

Dr. Cardo thanked the NICU Guideline Workgroup for a fantastic job and emphasized the way in which the new development process considers the evidence with a focus on preventing infections and protecting people.

Vote: Draft *S. aureus* Recommendations

The *S. aureus* recommendations were put forth as a group for approval as presented, with the exception of one edit:

Remove 2.1.B.2.a. that states, “Consider also collecting samples from the axilla, rectum, and umbilicus to increase yield.” Include that information in the Justification Tables and Narrative under recommendation 2.1.B.2. that states, “If active surveillance for *S. aureus* colonization of neonatal intensive care unit patients is performed, collect samples from at least the anterior nares of neonatal intensive care unit patients.” Explanatory information regarding potential additional sampling will be provided in the Narrative.

The vote carried unanimously, with no opposition and no abstentions. The disposition of the vote was as follows:

- **11 Favored:** Babcock, Brown, Bryant, Chopra, Dekker, Diekema, Fauerbach, Huskins, Maragakis, Patterson, Yokoe
- **0 Opposed:** N/A
- **0 Abstained:** N/A

NHSN Workgroup Update

Deborah Yokoe, MD, MPH
Michael Howell, MD
Co-Chairs, NHSN Workgroup

The NHSN Workgroup was created to provide a forum for discussing issues relevant to NHSN HAI surveillance. Topics for discussion include, but are not limited to:

- Analytics
- Data elements
- Definitions
- Surveillance methods
- Risk adjustment

The NHSN Workgroup provides input pertaining to:

- Data access policies and practices
- Data validation
- Quality and measurement priorities
- Strategies for making surveillance data as useful as possible for driving HAI prevention efforts at multiple levels (facility, local, regional, state, national)
- Advances in informatics and information technology that can be used to improve the consistency, efficiency, and usefulness of surveillance data
- Improving the ability to communicate this information to various stakeholder groups in a way that can drive improvements in practice

The NHSN Workgroup is large and includes a number of HICPAC members; representatives from CDC, including NHSN leadership and subject matter experts (SMEs); and a number of additional individuals with a variety of expertise and perspectives, representing several stakeholder groups.

HICPAC began discussing this Workgroup during its July 2017 meeting, during which some of the topic areas were identified. In order to work more efficiently, HICPAC decided at the November 2017 meeting to divide the work into 2 subgroups:

1. Data and Definitions Subgroup, co-led by Drs. Yokoe and Anthony Harris
2. Reports and Communication Subgroup, co-led by Drs. Howell and Chopra.

These groups meet by teleconference and exchange informational emails on a regular basis.

Data and Definitions Subgroup

Deborah Yokoe, MD, MPH
Co-Lead, Data and Definitions Subgroup

At the May 2018 HICPAC meeting, the Data and Definitions Subgroup presented the results of its deliberations regarding removing the age restrictions associated with the use of fever for the symptomatic urinary tract infection (SUTI) 1a and 1b NHSN surveillance definitions. The recommendation to remove the age restrictions was unanimously approved by HICPAC and forwarded to DHQP and NHSN. The recommendation will be posted on the HICPAC website.

The NHSN Workgroup has drafted for HICPAC's consideration a recommendation regarding the NHSN *C. difficile* infection (CDI) outcome addressing the impact of the CDI testing method on the SIR. This issue was identified as a priority by the Data and Definitions Subgroup because CDI SIRs, along with other HAI outcomes, are used by CMS and others to rank hospitals so that hospitals' performance these areas can have substantial financial impacts. A number of different CDI testing methods and strategies are used, resulting in variability among hospitals. Published

evidence and reports from the field indicate that the type of testing methods and algorithms used by hospitals can have substantial impact on their SIRs, which is likely to be independent from the quality of their CDI prevention programs.

With that in mind, the NHSN Workgroup proposed the following draft recommendation to HICPAC:

“Because there is evidence that even with recent modifications, the current CDI risk adjustment model does not optimally account for the impact of specific CDI testing methods used by individual hospitals on hospitals’ CDI Standardized Infection Ratios (SIRs), we strongly recommend that NHSN evaluate options for revising the *C. difficile* LabID event reporting and/or risk adjustment parameters.”

This recommendation urges NHSN to explore options for addressing this issue. The document accompanying the recommendation includes options for consideration raised by Workgroup members. Options include, but are not limited to:

- Requesting that hospitals report the specific type of positive test result, such as positive toxin enzyme immunoassays (EIA) and positive nucleic acid amplification tests (NAAT), for each LabID case to improve risk adjustment. For example, the positive test results could be weighed differentially depending upon the type of positive test for each patient.
- Generating SIRs that compare only hospitals using the same testing strategies, similar to how NICU BSI SIRs are stratified by birthweight, such that NAAT-only hospitals are compared only to NAAT-only hospitals, etc.
- Allowing hospitals that perform multi-step testing that includes both toxin EIA and NAAT to limit LabID reporting only to toxin-positive cases to minimize the impact of testing order. This suggestion applies to hospitals that use multi-step testing and reflects data that suggest that, at least for a subset of hospitals performing multi-step testing, the order of testing substantially impacts the SIR. For example, hospitals that perform NAAT as the initial step and then use toxin EIA as a confirmatory step are currently required to report only the toxin-positive cases into NHSN; whereas hospitals that perform the same tests, but in the opposite order, are required to report both toxin-positive and NAAT-positive results. Although there is a variable to risk-adjust based on whether the hospital is performing NAAT testing, there is evidence that this risk adjustment is inadequate for some hospitals.
- Recruiting a network of representative hospitals across the US to split stool samples and perform EIA testing on half, and NAAT testing on the other half, of the stool specimen to allow for the calculation of parameter estimates to yield the closest SIRs, independent of testing method. The results from these hospitals would help guide better parameter estimates for the NHSN network.

Each of the options has benefits, but also limitations. Overall, the recommendation is for NHSN to urgently evaluate options, including these and others, to address the potential impact of testing method on the current NHSN CDI outcome measure.

Reports and Communication Subgroup

Michael Howell, MD, MPH

Vineet Chopra, MBBS, MD, MSc, FACP, FHM

Co-Leads, Reports and Communication Subgroup

The Reports and Communication Subgroup focuses on the following topic areas:

1. Usability of reports: improving the interpretability of reports and metrics for infection preventionists (IPs), other hospital-based quality leaders, public health, and consumers; and
2. Communication and enhancing the “force multiplier” effect: exploring strategies to facilitate the use of surveillance data for actionable steps, and improving data integration into the HAI prevention work of consumer advocacy groups.

The Reports and Communication Subgroup has benefitted from learning from CDC SMEs about the number of the tools that use NHSN data:

- NHSN application demonstration
- Internal and external reports that use NHSN data
- Hospital Improvement Innovation Network (HIIN) summaries
- Targeted Assessment Prevention (TAP) Strategy Report infographics
- Antibiotic Resistance Patient Safety Portal demonstration

The Subgroup has also acquired feedback from individual facilities of a variety of sizes and types, as well as various professional organizations, consumer advocacy organizations, professional societies, and representatives of several NHSN facility users. Four key themes which are consistent across groups, have emerged from this effort:

- Usability of the tool itself and understandability of the reports
- Improved risk adjustment and stratification using patient-level data
- Better visibility into:
 - Devices and device utilization
 - Ambulatory surgical centers and outpatient setting SSIs
- Using data for improvement, including:
 - Better availability of “near-real-time” data
 - Using NHSN data for board-level (executive) reporting and compensation

Regarding usability and understandability of the reports, research shows that even experts misinterpret the reports frequently, and the majority of people who use NHSN reports are not “experts,” but other hospital personnel, including staff on the floor. The Subgroup has learned about and discussed a number of approaches to improve and enhance the understandability of reports. This body of work is large, and important.

Feedback has been strong regarding individual risk adjustment using patient-level data. The feedback included specific requests for better visibility into devices and device utilization, and several groups hope for NHSN to provide information about other domains. For instance, the issue of ambulatory surgical center and outpatient setting SSIs is a “vote for the value of NHSN;” that is, users see the value of NHSN and are interested in expanding it to other domains.

Discussions regarding using data for improvement have related to delays in reporting times. Even among experts, these issues may be associated with misunderstanding the existing capabilities of NHSN, and also to usability. The theme of using data for efforts such as executive compensation for board-level reporting was echoed by a broad set of stakeholders. When a facility’s infection rates rise, there may be intense pressure to manipulate the data rather than to focus on patient care. This issue represents “scope creep,” as it is an example of using NHSN data in ways for which they were not intended.

The next steps for the Reports and Communication Subgroup are to identify ways to improve the relevance and use of data, digging deeper into the idea of human factors or cognitive

science and systems engineering function, and available resources for it. This area is rich for further exploration.

Discussion Points

HICPAC Feedback

The Subgroups have done great work and engaged in insightful calls, with helpful feedback and process input from HICPAC members, other experts, and CDC staff who have dedicated time to improving NHSN and making the system more useful. The system will be even better with improved accessibility and if reports are easier to use and interpret. This goal is not in conflict with the excellent data sources, elements, reports, etc, that are great resources for program planning and involvement. NHSN data is influential in a number of ways, so it is wise to continue to improve the system.

The Data and Definitions Subgroup's involvement in larger, proactive planning of measure development is appreciated. This work will occur in parallel with "fixes," more than with "tweaks." For example, the current CDI measure needs a fix, not a tweak. The development of the CDI draft recommendation was a thoughtful process so as not to dictate what needs to occur, but to instill urgency to evaluate options for improvement. Other suggestions about how these adjustments could be made are welcome. There is commitment to determining which fixes are possible, and which will achieve the goal of a better measure for CDI that is actionable and beneficial for patients and for the hospitals that devote resources to programs based on NHSN data. The comparisons should be valid, reliable, and helpful to patients and hospitals.

Ex officio and Liaison Representative Feedback

HRSA observed that as more hospitals are completing the Annual Facilities Survey, it is becoming clear that many of them are "simply checking the boxes." When the State Program Managers conduct site visits with HRSA, they realize that the information reported on the surveys does not always align with the hospitals' practices and policies. HRSA has added the Annual Facilities Survey into its own data reports and has worked with hospitals one-on-one. Some states attach a financial incentive to each core element such that if a hospital states that an element is fulfilled, but it is not, funds are retracted. Each state uses a different strategy. In the upcoming year, HRSA will convene focus groups: one will address facilities that are just starting out, enrolling, and beginning to fill out the survey. Another will focus on hospitals that are more experienced and have complete antibiotic stewardship programs, to determine how they can mentor others. Then, a strategy will be put in place to meet the goal of 100% of HRSA's critical access hospitals (N=1342) implementing a full antibiotic stewardship program.

NIH agreed with the goal of creating a better measure for CDI that is actionable and beneficial for patients and hospitals. This issue is a reminder of the chronic problem facilities have with sensitivity and specificity. When one is "dialed up," the other often "dials down." This work must be done with caution, knowing that unanticipated consequences may result with even slight "tweaks," never mind "big fixes."

The Association of Professionals of Infection Control and Epidemiology (APIC) expressed gratitude to the NHSN Workgroup for approaching these issues from an infection prevention perspective. IPs work with these data every day to assess trends in their facilities. While the data were not created for board-level reporting, IPs work with this use within their facilities.

General Responses/Observations

Dr. Cardo thanked the NHSN Workgroup for the hard work and feedback, noting that the work is ongoing and stressing their philosophy to learn and improve continuously. This Workgroup provides a systematic approach for that process. While NHSN is critically important, it is only

one of several sources of data, including the EIP report that addresses *C. difficile* and MRSA, and the ARLN report that focuses on isolates. The data are used by a number of different user groups. Additionally, the call for more timely reports is heard frequently. CDC has the Patient Safety Atlas web application and is moving toward the Patient Safety Antibiotic Resistant Portal, an updated way to access reports in one place, some of which are interactive. Many lessons are to be learned from the states' innovative activities.

Dr. Cardo thanked the NHSN Workgroup for their work on the CDI risk adjustment and agreed that improvements are needed. Improvements must consider patients, hospitals, practice, type of testing, etc. Consideration also must be given to the feasibility of changes such that they can be used by CMS. In doing this work, it is clear that the field needs to evolve. Solely defining an event by a laboratory result can become an issue. There is an opportunity for the NHSN Workgroup to work with DHQP not only to address *C. difficile*, but also hospital-onset bacteremia (HOB), addressing the range of available tests. Consideration must be given not only to the metric, but also to which data to collect in addition to the laboratory results. Many facilities are moving toward a non-culture-based diagnostics approach for HOB. DHQP is in the process of defining how to monitor those infections, given changes in the field.

Dr. Yokoe thanked Dr. Cardo for her input and added that the NHSN Workgroup has discussed HOB. They also have had initial discussions about patient-level risk adjustment, which may be applicable “across the board.” The vote on the CDI outcome is not the end of their work, and HICPAC is happy to continue to work with NHSN to explore these options.

Vote: CDI Outcome

HICPAC unanimously approved the draft recommendation on the NHSN CDI outcome as presented, with no opposition and no abstentions. The disposition of the vote was as follows:

- **11 Favored:** Babcock, Brown, Bryant, Chopra, Dekker, Diekema, Fauerbach, Huskins, Maragakis, Patterson, Yokoe
- **0 Opposed:** N/A
- **0 Abstained:** N/A

HICPAC Recommendation Categorization Workgroup Update & Public Comment Summarization

Dan Diekema, MD

Co-Chair, HICPAC Recommendation Categorization Update Workgroup

In 2017, the HICPAC Recommendation Categorization Workgroup embarked on the process of updating HICPAC's recommendation categories to:

- Simplify the recommendation categories;
- Improve transparency regarding the rationale for the choice of recommendation category;
- Better address practices for which evidence is scant or absent, and particularly to decrease the number of “No Recommendations;” and
- Address bundled practices.

The work included monthly Workgroup calls; discussion at HICPAC meetings in July 2017, November 2017, and February 2018; approval by a HICPAC vote in February 2018; and early “test” applications of the draft scheme with the *Guideline for Prevention of Catheter-Associated Urinary Tract Infections (2009)* and the in-progress *Guideline for Infection Prevention in NICU Patients*.

Table 1 addresses the overall strength of recommendations and includes three categories:

- Recommendation
- Conditional Recommendation
- No Recommendation

A Recommendation means that HICPAC is confident that either the benefits of the recommended approach exceed the harms, or the reverse. While a Recommendation should generally be supported by high- to moderate-quality evidence, in some circumstances, HICPAC may base a Recommendation on lesser evidence or on expert opinion when no high-quality evidence is available and none is anticipated in the future. The implied obligation of a Recommendation is that a facility “should” implement the recommended approach, unless there is a clear and compelling rationale for an alternative.

For a Conditional Recommendation, benefits are *likely* to exceed harms, or the reverse. The implied obligation of a Conditional Recommendation is that a facility “could” or could “consider” implementing the recommended approach, with the degree of appropriateness depending upon the benefit versus harm balance for a specific setting.

The No Recommendation category is utilized when there is both a lack of pertinent evidence and an unclear balance between benefits and harms.

In addition to simplifying the recommendation categories, an important contribution of this update is *Table 2: Justification for Choice of Recommendation*. This table makes HICPAC’s reasons for making recommendations transparent. The components of the justification include: Aggregate Evidence Quality, Benefits, Harms, Benefit-Harm Assessment, Resource Use, Value Judgments, Intentional Vagueness, and Exceptions.

Table 3 addresses the quality of evidence for each recommendation, with the following definitions of the levels:

- High:** Highly confident that the true effect lies close to that of the estimated size and direction of the effect. For example, confidence is rated as “High” when there are multiple studies with no major limitations, there are consistent findings, 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, confidence is rated as “Moderate” when there are only a few studies and some have limitations but not major flaws, there is some variation between study results, 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, confidence is rated as “Low” when supporting studies have major flaws, there is important variation between study results, the confidence interval of the summary estimate is very wide, or there are no rigorous studies.

The *Guideline for Infection Prevention in NICU Patients Workgroup* found it useful to divide the “Aggregate Evidence Quality” component of the *Justification Table* into a statement of the supporting evidence, and the confidence in that evidence. Perhaps instead of using language that states “low-quality evidence,” it would be beneficial to state, “This is the evidence, but our confidence is low because the evidence may include, for example, observational studies prone to bias.”

The draft Recommendation Categorization scheme, including all 3 tables, was announced in the *Federal Register* and posted to Regulations.gov (www.regulations.gov) for public comment on September 17, 2018. The Public Comment period closed on October 17, 2018. No comments were received from the public.

Discussion Points

In Table 2, HICPAC supported the division of Aggregate Evidence Quality into Supporting Evidence and Confidence in Evidence, and renaming Table 3, “Quality of Evidence,” to “Level of Confidence in the Evidence.”

The Association of periOperative Registered Nurses (AORN) is updating its own recommendation categorization model and has reviewed the HICPAC draft scheme closely. AORN supports the draft HICPAC scheme. One minor grammatical modification was suggested: in Table 1, the Recommendation “Language” states that “declarative verbs” should be used, but the phrase “action verbs” is more appropriate.

Ms. Stone recalled that during the development of the *Guideline for the Prevention of Surgical Site Infections, 2017*, questions repeatedly surfaced regarding the meaning of “High,” “Low,” and “Moderate” quality evidence. These terms can be perceived as pejorative. To avoid this implication, “Quality” has shifted to “Risk of Bias.” Adopting this approach in the HICPAC scheme will harmonize with the methodology that considers “Risk of Bias” in summarizing confidence in the evidence. For instance, an evidence assessment could highlight that outcomes were discordant across studies, or indicate that the evidence base was comprised largely of small observational studies, and perhaps a large RCT could affect the results and lead to a different recommendation.

Dr. Bryant added that the NICU Workgroup’s experience with applying the draft scheme was smooth. The Justification Tables summarize the evidence and conclusions clearly and transparently, and point directly to the recommendation.

The Public Health Agency of Canada (PHAC) commended the recommendation categorization scheme. PHAC has experienced similar challenges with writing guidelines and created a tool to critically evaluate and weigh the quality of evidence. There are legal elements to consider regarding when recommendations state “should,” “must,” “can,” and “consider.” HICPAC captured these nuances well. While PHAC does not routinely specify reasons for recommendations and guidelines, detailed records are kept of any consultations and how decisions are made, and supporting evidence is provided.

The US Department of Veterans Affairs (VA) commented that the tables are simple and use language that is widely understood and used. Simplicity is important, given the variety of people who will read and apply these recommendations.

Prior to the vote, Dr. Diekema reiterated the proposed clarifying changes to the tables:

- In Table 2, the Aggregate Quality of the Evidence component was divided into 2 components: Supporting Evidence and Confidence in Evidence.
 - Clarifying comments are added in the third column of the table for the new components.
 - The Supporting Evidence component will describe the number and type of available evidence used (eg, “10 observational studies”), and the Confidence in the Evidence category will be worded similarly as in the example, “The level of confidence in this evidence is low, as observational studies are at increased risk of bias.”
- The title of Table 3 was changed from “Quality of the Evidence” to “Level of Confidence in the Evidence.”

Vote: HICPAC Recommendation Categorization Scheme

HICPAC unanimously approved the HICPAC Recommendation Categorization Scheme with the changes described by Dr. Diekema. There was no opposition and there were no abstentions. The disposition of the vote was as follows:

- **11 Favored:** Babcock, Brown, Bryant, Chopra, Dekker, Diekema, Fauerbach, Huskins, Maragakis, Patterson, Yokoe
- **0 Opposed:** N/A
- **0 Abstained:** N/A

Updating Infection Control Guidelines

Erin Stone, MA

Committee Management Specialist

Healthcare Infection Control Practices Advisory Committee

Division of Healthcare Quality Promotion

Centers for Disease Control and Prevention

CDC's first Infection Control Guidelines included the following, some of which are still in use:

- 1970,1975: Isolation Techniques for Use in Hospitals
- 1981: Urinary Tract Infections
- 1981: Environmental Control
- 1981: Intravascular Infections
- 1982: Surgical Wound Infections
- 1982: Nosocomial Pneumonia
- 1983: Isolation Precautions
- 1983: Infection Control for Hospital Personnel
- 1985: Handwashing and Hospital Environmental Control
- 1985: Surgical Wound
- 1988: Surveillance Definitions for Nosocomial Infections

HICPAC was chartered in 1991 as a federal advisory committee of DHQP, CDC, and HHS. The Federal Advisory Committee Act is one of a group of “Sunshine Laws” which were intended to “shine a light” on the government’s decision-making processes, ensuring that the public and relevant stakeholders are informed about, and included in, those processes and that decisions are not made “behind closed doors.” HICPAC was chartered to provide advice and guidance on the practice of hospital infection control, and strategies for surveillance, prevention and control of HAIs. The first HICPAC meeting was convened in 1992, and the agenda included a review of the *Pneumonia Guideline*. That guideline is once again on the horizon for potential update.

Recent CDC and HICPAC guideline work includes:

- 2002: Hand Hygiene (Isolation Precautions, 2007)
- 2003: Environmental Infection Control
- 2003: Pneumonia
- 2006: Multidrug-Resistant Organisms
- 2007: Isolation Precautions
- 2008: Disinfection and Sterilization
- **2009:** Catheter-associated Urinary Tract Infections
- **2011:** Intravascular Catheter-Related Infections
- **2011:** Norovirus Gastroenteritis Outbreaks in Healthcare Settings
- **2017:** Guideline for Prevention of Surgical Site Infection (Updates 1999 Guideline)
- **In progress:** Prevention of Infections in Neonatal Intensive Care Units
- **In progress:** Infection Control in Healthcare Personnel (Updates *Guideline for infection control in healthcare personnel, 1998*)

The guidelines from 2009 forward represent the current evidence-evaluation era. The development process is iterative, rigorous, and transparent and incorporates constant improvement, but it is time-consuming. Ideally, guidelines are developed in an 18-24 month timeframe, including systematic review of available relevant evidence, management and disclosure of Workgroup members' potential conflicts of interest, stakeholder involvement throughout, and presentation at HICPAC meetings. All HICPAC meeting minutes are published online and HICPAC meetings are open to the public, with opportunities for public comment. Public comment is also solicited when drafts of guidelines are posted on Regulations.gov (www.regulations.gov) and announced in the *Federal Register*. Public input is a critical aspect of guideline development, as the guidelines are used as the basis for standards of care, education and training, provider and surveyor checklists, prevention initiatives at the federal level (eg, CUSP, QIOs), and to define research gaps (eg, Prevention EpiCenters).

The 2017 *Guideline for Prevention of Surgical Site Infection* was a targeted update to the 1999 guideline that focused on areas deemed important by the field, where gaps were identified, or where supporting evidence had changed. Many of the 1999 SSI recommendations were not updated, but simply brought forward as best practice statements. In thinking about how to further improve the guideline updating process, it became clear that some recommendations are, in fact, Core Practices and standards of care that will not have new evidence and will not change, barring a major shift in the field. Separating these Core Practices from all Guidelines allows those practices not to be reassessed with each guideline update, and streamlines the Guideline updating process.

Another approach to updating guidelines focuses on updating or developing one recommendation at a time as evidence becomes available. This approach was applied to the *Updated Recommendations on the Use of Chlorhexidine-Impregnated Dressings for Prevention of Intravascular Catheter-Related Infections (2017)*. This single recommendation update to the *Guidelines for the Prevention of Intravascular Catheter-Related Infections (2011)* was accomplished in 18-24 months.

In order to avoid “No Recommendations” in guidelines, which can be frustrating, DHQP has begun piloting exploratory literature reviews, informally called “Desk Reviews.” In this process, a Key Question or Questions is proposed and an initial search is conducted for current guidelines and recommendations to determine whether the proposed question is captured elsewhere. If a gap is identified, a short list of relevant Medical Subject Headings (MeSH) terms and keywords from the Key Question(s) is generated and vetted with internal and external experts. A brief, targeted literature search is then conducted that includes the PROSPERO and Cochrane Library databases as well as PubMed/Medline. The results of that concise search are reviewed in order to estimate the extent of available applicable literature and whether a full systematic review is warranted. If it is determined that sufficient evidence is not available for analysis, then the Key Question is not pursued.

This approach has been useful for the *Guideline for Infection Prevention in NICU Patients*. One of the original Key Questions was, “Should transmission-based precautions be modified for isolettes?” The conclusion of the Desk Review was that evidence is insufficient to support development of a recommendation on this issue. Therefore, the question will be addressed in the SHEA companion document, which will include evidence-informed and expert opinion-based recommendations.

The update to the *Guideline for Infection Prevention in Healthcare Personnel* has piloted methods for streamlining evidence-based updates. For this update, recommendations that are in the purview of another CDC group are sunsetted in DHQP and HICPAC Guidelines, and the updated Guideline will now refer readers to the appropriate CDC resources. For example, the

updated Guideline narrative will refer to *ACIP 2011 Recommendations for Immunization of Healthcare Personnel* and to the HICPAC Core Practices Document. It is not feasible for HICPAC to be responsible for updating recommendations from other Federal Advisory Committees, or for maintaining those recommendations in HICPAC documents. Additionally, where possible, recommendations will be updated by harmonizing DHQP Guideline Recommendations with CDC recommendations from other divisions that have been updated since the 1998 Guideline was published. The exploratory “desk” literature review has been utilized for the Healthcare Personnel Guideline as well for the influenza and respiratory viruses section. Where necessary, full systematic literature reviews are conducted, to determine if the evidence base has changed, such as for the *S. aureus* section.

The work to harmonize HICPAC recommendations with other updated CDC recommendations is particularly important for the *Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (2007)*. That document’s *Appendix A: Type and Duration of Precautions Recommended for Selected Infections and Conditions* is one of CDC’s most “hit” pages. The PDF of Appendix A is DHQP’s most-downloaded document, and it has been one of the top 10 most-downloaded documents for all of HHS: last year, it was downloaded approximately 200,000 times. The next-most-downloaded infection control guideline is the *Guideline for Disinfection and Sterilization in Healthcare Facilities (2008)*, with approximately 60,000 downloads per year. The Isolation Guideline home page receives approximately 400,000 visits per year. It is therefore important to target efforts toward these visible documents. Recently, updates for clarity and readability were made to the Isolation Precautions guideline. Several corrections have been made, and additional updates are on the horizon based on updated literature or to harmonize with other CDC guidelines.

In February 2008, HICPAC updated the duration of Droplet Precautions for Mumps from 9 days to 5 days based on new data related to mumps in healthcare settings, mumps viral load, and mumps virus isolation. In October 2008, CDC published *Updated Recommendations for Isolation of Persons with Mumps* in the *MMWR*. It is now possible to update Appendix A online, adding a symbol indicating that an update has been made and providing the updated language with a justification for the change. When these changes are made, the website also states, “The below note has been superseded by the above recommendation update” and provides the previous language. These updates are compiled on an “Updates” page on DHQP’s website. Each superseded version is archived at CDC Stacks (<https://stacks.cdc.gov/>).

These infection control documents, especially the *Guideline for Isolation Precautions*, can go out of date quickly if efforts are not made to ensure that they are “evergreen.” In 2007, the recommendation for postexposure prophylaxis (PEP) for Varicella for persons at risk for severe disease for whom vaccination is contraindicated was to use Varicella Zoster Immune Globulin (VZIG). In 2011, the Advisory Committee on Immunization Practices (ACIP) updated its recommendations to VariZIG, which at the time was the only varicella zoster immune globulin product available in the US. Because the recommended agent for Varicella PEP is subject to change again, HICPAC could provide a simple update to the 2007 Isolation Guidelines, removing the proprietary name and stating, “varicella zoster immune globulin.” Simple updates such as this one to harmonize with CDC guidelines can be made without a traditional evidence review.

Another example of a simple update is for the *Guideline for Disinfection and Sterilization in Healthcare Facilities (2008)*, which states, “Currently, no products are EPA-registered specifically for inactivating *C. difficile* spores.” Since the guideline was published, EPA has published List K, a list of registered antimicrobial products that are effective against *C. difficile*. Because this change is a change of federal and regulatory approvals, a thorough evidence review is not needed to update and harmonize the recommendation in the Guideline. The

updated recommendation will state, “Use an EPA-approved sporicidal disinfectant for environmental disinfection in rooms where *C. difficile* patients are treated. **Category II.** (<https://www.epa.gov/pesticide-registration/list-k-epas-registeredantimicrobial-products-effective-against-clostridium>).”

Further, the *Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings* (2007) Appendix A indicates that Standard Precautions should generally be implemented for noroviruses, and caveats for when Contact Precautions should be implemented are described. However, in 2011, the *Guideline for the Prevention and Control of Norovirus Gastroenteritis Outbreaks in Healthcare Settings* was published, and it notes that patients with symptoms consistent with norovirus gastroenteritis should be placed on Contact Precautions in a single-occupancy room. This change was meant to supersede Appendix A from the 2007 Isolation Precautions. This updating is particularly important given the frequency with which Appendix A is accessed and downloaded.

DHQP is considering several questions and issues as the processes for updating guidelines continue to evolve:

- What is the threshold to migrate toward timelessness?
 - Each guideline document is identified by year. If updates are conducted recommendation-by-recommendation, when should the date of the overall document change?
- The process for updating agency and regulatory changes needs to be standardized.
 - Should an annual review be conducted to determine recommendations that should be updated? If so, HICPAC will be updated regarding the necessary changes.
- What are other innovative ways to keep CDC and HICPAC guidelines “evergreen?”

Discussion Points

HICPAC appreciated the overview of the guideline development process and Ms. Stone’s leadership in identifying strategies to become more nimble in guideline production and updating.

The systematic review process has improved with the addition of the Exploratory Literature Review, which frames questions succinctly and allows for streamlined literature searches. This new approach of a “shallower dive in a smaller area” helps the HICPAC process become more nimble and agile. One consideration is the question of “how deep to dive,” and how to ensure that all important information is retrieved. Another consideration is the notion that data from a decade ago may no longer be clinically relevant. The process will need to take this tension into account.

New tools for conducting systematic reviews are now available that can reduce the time needed for a review from 18 months down to as little as 3 to 6 months. One example is UptoDate, an online resource used for clinical decision-making. In this resource, expert authors write chapters using systematic literature searches. Every 6 months, the literature is updated and the authors determine whether the chapters should be updated.

Ms. Stone said that CDC has pre-existing literature searches for guidelines since the CAUTI Guideline (2009). To update this literature search, for example to determine all interventions that could prevent CAUTI, would represent a massive undertaking with thousands of references. Moving forward, it is feasible to conduct periodic updates of specific, targeted searches aimed at a specific, targeted question for a recommendation. CDC has utilized systematic review software that had limited licenses, but is changing to a new systematic review software that will allow for unlimited licenses, permitting access for external Workgroup members to facilitate the process. In an ideal scenario, an artificial intelligence (AI)-driven process could constantly

update literature searches for guidelines and recommendations, alerting when a critical mass of new literature is available.

HICPAC highlighted the importance of communicating changes when updates are made, and to work with the *Morbidity and Mortality Weekly Report (MMWR)* and professional societies to help make the field aware of them. This communication also could be a means by which to send out information about the rationale for the update.

HICPAC observed that the “last reviewed” or “last updated” date appears at the bottom of each web page, and this information is key for indicating whether a guideline is current.

Some retrieved studies may be interesting, but are ultimately not applicable to formulating an evidence-based guideline. In such a case, HICPAC suggested language indicating that they are aware of these studies, but that they are not sufficient for changing current guidelines.

In addition to the vision of a continuous update to existing guidelines, HICPAC suggested identifying a mechanism for when recommendations need to be added on new topics, or when recommendations need to be “retired.”

Dr. Cardo appreciated the new tools and approaches that will improve the guideline development process. She further noted that the process for receiving and responding to public comment has also improved over the years. Many guidelines and recommendations need to be updated, and some may be more relevant than others. The process is important even when it is determined that no new evidence is available to support an update or change, because that information can help shape the work of the Epicenters and other groups.

Public Comment

Kevin T. Kavanagh, MD, MS (Retired)
Board Chair
Health Watch USA

Dr. Kavanagh commented on the Products and Practices Workgroup. It would be interesting to use this tool to evaluate the use of daily bathing with chlorhexidine wipes for the prevention of MRSA. He believes that there are integrity problems with some of the underlying research in this area. A Reuters investigation reported that the FDA has a warning regarding chlorhexidine wipes as a general skin cleanser. He recommended caution when using this product with neonates when there is potential for skin absorption. He opined that much of the research surrounding chlorhexidine has a history of conflicts and integrity problems. Dr. Kavanagh suggested that the Products and Practices Workgroup consider reviewing some of major research papers on www.clinicaltrials.gov on which the recommendations are based, and considering issues such as changes in research objectives or changes in metrics after the research has begun or the trial has concluded. He further recommended reviewing FDA’s MAUDE (Manufacturer and User Facility Device Experience) database for newly-reported device events related to the product under consideration.

Dr. Kavanagh commented on the draft recommendations for the *Guideline for Infection Prevention in NICU Patients*. MRSA is a personal issue for him because MRSA rates are extremely high in his home state of Kentucky, where some facilities have some of the highest rates of infection in the nation. He emphasized the comments from CSTE, noting that MRSA is endemic and that rates of MRSA have plateaued. Rates must be drastically reduced in order to meet 2020 goals. He does not believe that rates can be reduced substantially if efforts are reactionary, and if efforts only consider interventions that are triggered if infection rates are above a “pre-defined norm,” which is already too high. The endemic baseline at facilities must be lowered, so prevention of MRSA must be a focus.

Dr. Kavanagh commented that a draft slide for the *Core Practices for NICUs* referred to 2.1.A.1. stated, “Standard Precautions.” A new update states that full Contact Precautions, not Standard Precautions, should be used in the NICU.

Liaison / Ex Officio Reports

American College of Occupational and Environmental Medicine (ACOEM)

The guidance for TB surveillance among healthcare personnel (HCP) is anticipated to be published in the late spring of 2019. A companion document likely will be published in the *Journal of Occupational Environmental Medicine*. A number of ACOEM members are working on this guidance with National Tuberculosis Controllers Association (NTCA) representatives. This guidance will represent a fairly substantial operational change for occupational health units within hospitals in terms of issues such as pre-placement testing, annual education, and enhancing the movement of those with latent disease to treatment.

America’s Essential Hospitals (AEH)

Several of AEH’s members have committed to the AMR Challenge. For example, Essential Hospitals identified as CDC Prevention Epicenters will be evaluating a machine-learning model that can provide surgeons real-time decision support to prevent infections. AEH is involved in social media, and AEH staff participated in a Twitter Chat hosted by CDC during International Infection Prevention Week in October and APIC. AEH also has a Facebook presence. AEH expressed gratitude to CDC and Dr. Amy Wolkin for leading the discussion on Vulnerable Populations During Disasters. There seem to be environmental and other types of disasters on a regular basis throughout the country and the world, and it is important to be prepared for them. An AEH website (www.essentialcommunities.org) highlights the work of its members and provides resources on public health partnerships, care coordination approaches, and data integration strategies to guide public health efforts.

Agency for Healthcare Research and Quality (AHRQ)

AHRQ provided a written report.

Association of periOperative Registered Nurses (AORN)

AORN has completed a 6-city workshop series on infection prevention and safety, which addressed wound healing, SSI, sterile techniques, sharps safety, surgical smoke safety, and AORN’s role in the opioid crisis. This series shared best practices information. AORN is completing its guidelines for 2019 publication, the last of which is *Transmission-Based Precautions*, which will go live electronically on December 1. A webinar for members will be held on December 5. The notable change in that guideline is a significant expansion of the personal protective equipment (PPE) section, with guidance on selection, use, donning and doffing, enhancement of the perioperative nurse information on best practices, and aligning with CDC protocols. AORN’s biggest challenges, upon which they will focus educational efforts, are managing workflows with Contact Precautions through patient transport, and how PPE is worn during a procedure. The guideline is harmonized with the Infectious Diseases Society of America (IDSA) on hand hygiene recommendations for *C. difficile* patients and with SHEA for managing visitors and Isolation Precautions.

AORN is revising its evidence model to align with the new HICPAC Recommendation Categorization scheme. The revised model is being tested with the revision of the AORN *Guideline for Surgical Attire*, which will be released for a 6-week public comment period on January 2, 2019. The revision incorporates major changes to the guideline, including use of the new model and recommendation categories and the subjects of head covering, ear covering, and long sleeves. AORN has benefited greatly from using the new categorization scheme for

rating their recommendations and assessing the evidence. With this new model, they are also revising the guideline format: next year, all AORN guidelines will be revised into the new format for publication in 2020. This project includes numerous changes in an effort to improve the user experience and improve implementation support. Lastly, the ECRI Guidelines Trust™ has accepted 9 AORN guidelines for inclusion that were previously accepted by the National Guideline Clearinghouse™ (NGC), which compares guidelines to the Institute of Medicine Medicine (IOM) standards for trustworthy guidelines and provides a brief scorecard. In total, 24 guidelines have been accepted into the Trust, and 3 more are pending for submission. Ms. Amber Wood has transitioned into the Editor in Chief role for the AR Guidelines, so the new AORN Liaison Representative to HICPAC will be Karen DeKay.

Association of Professionals of Infection Control and Epidemiology (APIC)

In the summer of 2018, the CEOs of APIC and SHEA wrote a collaborative op-ed for leadership at hospitals to promote the importance of antimicrobial stewardship with IP co-collaborators. APIC recently convened a Consensus Conference, which several HICPAC members attended. The focus of the conference was on re-imagining and expanding the role of an IP outside of the acute care setting in sites such as dental offices, ambulatory facilities, and others. APIC is excited about the future role of IPs in non-acute care settings.

American Nurses Association (ANA)

ANA provided a written report.

American Society of Nephrology (ASN)

ASN is a new liaison organization to HICPAC. About 500,000 patients in the US are on dialysis, and about 80,000 die per year. Of those 80,000, 8% to 10% die of potentially preventable infections. Infection is a substantial burden for end-stage kidney disease patients. Recently, CDC awarded a grant to CDC to form a group called “Nephrologists Transforming Dialysis Safety” with a target of 0 preventable infections in dialysis units. In the last 2 years, ASN has worked especially in 3 areas:

- Review evidence-based guidelines and evidence that suggest ways of preventing and managing infections in dialysis units
- Implement human factors engineering projects to observe exactly what is happening in each of 6 dialysis units around the country, and to abstract principles of the best way of doing the work that very busy nurses and technicians do in dialysis units, and use the guidance to do what is necessary to stop infections
- Provide nephrologists with training for effective leadership, which is critical at the unit level for championing and prioritizing prevention.

Association of State and Territorial Health Officials (ASTHO)

In a joint effort with CSTE, ASTHO has made a major commitment to CORHA. The CORHA website includes a “Resource Hub.” ASTHO is also participating in CDC’s AMR Challenge in collaboration with affiliate partners. ASTHO has a Healthcare and Infection Control Gateway (<http://astho.org/healthcare-and-infection-control/>) that provides guidance to state health officials, as well as a podcast episode titled, “Policy Approaches to Containing Antimicrobial Resistance.”

Council of State and Territorial Epidemiologists (CSTE)

CORHA has launched an additional Policy Workgroup, the purpose of which is to improve policy and legal status for outbreak reporting, investigating, notification, and disclosure of HAI/AR

pathogen outbreaks and exposure events. For the purpose of this Workgroup, the following definitions are important:

- *Outbreak reporting* is defined as activities that occur when a facility reports a possible outbreak to a local and/or state health department(s).
- *Notification* occurs when individuals, including patients potentially affected by an outbreak or otherwise have a right to know, are informed of their risk.
- *Disclosure* is defined as activities that occur to inform individuals beyond the patients potentially affected by an outbreak.

During the last annual meeting, the *Candida auris* (*C. auris*) Position Statement passed, which makes *C. auris* a nationally notifiable condition. In addition, the Antimicrobial Resistance Surveillance Task Force (ARSTF) issues a Year 2 report with its recommendations. This report includes significant action items. A Drug Diversion toolkit has been developed to address situations in which HCP divert anesthetic or pain medications for their own use, which is currently undergoing clearance at CSTE and is expected to be published soon.

Health Resources and Services Administration (HRSA)

HRSA announced that November 15 was National Rural Health Day, with a number of events occurring nationwide. HRSA has partnered with CDC and CMS this year: on November 13, 2018, HRSA collaborated with CDC on a Webinar on 5 ways that pharmacists can be “antibiotics aware.” HRSA’s work with CMS includes HIINs and work in rural hospitals pertaining to the opioid crisis, as well as to antibiotic stewardship. Telehealth is an important theme this year. HRSA held a Twitter chat about telehealth, and the concept of Tele-Stewardship is “up and coming” as a way to provide training, education, and implementation of full antibiotic stewardship.

Infectious Diseases Society of America (IDSA)

IDSA, together with partner organizations, successfully convened IDWeek 2018 in San Francisco on October 3-7. The theme was “Advancing Science, Improving Care.” IDSA announced in August the first 25 recipients of its Antimicrobial Centers of Excellence (CoE) designation. Launched in 2017, this program recognizes institutions that have created stewardship programs led by infectious disease physicians and infectious disease-trained pharmacists that are of the highest quality and have achieved standards established by CDC. These opportunities are critical to turn focus to urgent stewardship needs in this country and internationally. In conjunction with the American Society for Microbiology, IDSA published *A Guide to Utilization of the Microbiology Laboratory for Diagnosis of Infectious Diseases*, which is critical both to clinical practice and to infection prevention. IDSA has engaged in a great deal of work pertaining to legislation, policy, and advocacy. The society has been taking a more assertive stand in terms of the appropriate distribution of funding and resources to combat AR, increasing immunization access, building healthcare workforces, and enhancing capacities for medical countermeasures and personnel deployment in response to outbreaks. IDSA has proudly joined CDC in the AMR Challenge and looks forward to the continued impact of that program over the course of the year.

National Association of County and City Health Officials (NACCHO)

NACCHO focuses on supporting local health at the jurisdiction level. Many local health jurisdictions do not have infection prevention resources, or even a nurse. NACCHO’s toolkit for local health is being revised and will be launched soon. NACCHO is also revising its policy statement for NHSN. The goal is to implement data surveillance at the local level, which has been challenging, but is anticipated to be launched in July 2019. NACCHO also will launch a national assessment of all local health jurisdictions to assess their capacity to learn whether

their efforts have had positive impact, or whether the focus needs to change. This work is exciting, given some areas have few resources.

National Institutes of Health (NIH)

NIH has completed 5 years of prospective surveillance for carbapenemase-producing organisms (CPO) and is currently summarizing that experience. Approximately 60% of the hospitalized patient population is immunosuppressed. At the most recent HICPAC meeting, NIH had provided an update on an indolent outbreak of 11 clonal *Sphingomonas* infections in 12 years. The source was identified as the potable water supply, and numerous interventions were implemented. No additional infections have been detected for 21 months, but at this rate, it will take at least 7 to 8 years to approach significance at the 5% level. Clonal isolates live in the biofilm in the water supply. At this year's IDWeek, a representative from Duke University described a similar problem in their hospital with mycobacterial infections in the water supply and posited that the problem is related to the way that hospitals are now constructed, with a loop of hot water circulating constantly above the units in the hospital. The VA has that set of circumstances, but has not isolated this organism from that source, only from "downstream." NIH has recruited a new Chief of the Department of Laboratory Medicine for the Clinical Center: Karen Frank, MD, PhD. Dr. Frank came to the NIH from the University of Chicago, where she served as Chief of Microbiology. NIH is recruiting for a Chief of Microbiology and for 2 Doctoral-level microbiology staff clinicians or staff scientists to work with the Clinical Laboratory.

Public Health Agency of Canada (PHAC)

PHAC's focus is increasingly on AMR and antimicrobial use at the professional guideline, surveillance, and laboratory levels. It is a constant to balance all of the other important core issues. PHAC described 2 recent surveillance reports:

- the Canadian Nosocomial Infections Prevention Surveillance Program (CNISP)
- the Canadian Antimicrobial Resistance Surveillance System (CARSS)

The most recent Ebola outbreak sparked a review of all existing Ebola documents created in 2014 to update or sunset them. After months of work, 6 documents were streamlined to 2 basic documents: *Infection Prevention and Control Measures for Health Settings*, and *Infection Prevention and Control Measures for Pre-Hospital Care and Patient Transport*. PHAC hopes to keep these 2 documents "evergreen." *Prevention of Transmission of Bloodborne Viruses (BBVs) from Infected Healthcare Workers in Healthcare Settings*, which PHAC has been working on for many years, has been approved by PHAC's National Advisory Committee and is now moving forward for translation and final edits before a 2019 release. Creating this guideline included public consultation with 120 stakeholders, and it has generated international interest. PHAC also updated CRE guidance to add focus on CPE. PHAC is updating the *Prevention and Control of Occupational Infections in Healthcare* Guideline, not duplicating CDC's efforts. PHAC is also updating and streamlining the Canadian Influenza Preparedness Plan (CPIP), which includes a Healthcare Sector Annex.

The Annual Influenza Campaign is underway, which is leveraging the anniversary of the Spanish flu. For Infection Prevention Control Week and Antibiotic Awareness Week, a special publication focused on HAI and AMR issues. One document describes the National Advisory Committee on Infection Prevention and Control (NAC-IPC) and its guideline development process, another addresses medical tourism and AR, and a third focuses on *C. auris*. Other key areas for PHAC include vaccine-preventable diseases and influenza. Opioids are a major area of focus for PHAC. The Chief Public Health Office's annual report this year focused on preventing problematic substance use in youth. Cannabis is now legal throughout Canada, so public health awareness campaigns will focus on that.

Pediatric Infectious Disease Society (PIDS)

PIDS appreciates the opportunity to participate on HICPAC as a Liaison Organization. PIDS is involved many activities related to pediatric infectious diseases, but of interest to HICPAC, they have focused on AR. PIDS has endorsed the SHEA guidelines on *C. difficile* prevention in the NICU. They have participated in the Antimicrobial Resistance Commitments from the UN and have endorsed those guidelines. They are anxiously awaiting the publication of the *Handbook of Pediatric Infection Prevention and Control*, to which many members of PIDS and SHEA contributed. This handbook will be an excellent tool for pediatric infectious disease physicians as well as other colleagues who may be involved in the care of children with infection prevention and control issues. PIDS is the recipient of an unrestricted education grant from Sanofi Pasteur to create *The Vaccine Handbook: A Practical Guide for Clinicians 2018*, which is now being made into an app and is available from iTunes. It is affectionately known as “The Purple Book.” PIDS will co-sponsor the 10th Annual International Antimicrobial Stewardship Conference May 30-31, 2019, at Washington University in St. Louis, Missouri. PIDS's Pediatric Committee on Antimicrobial Stewardship has partnered with the AAP Section on Infectious Diseases and Healthcare without Harm to develop a toolkit for inpatient and outpatient antimicrobial stewardship, which is anticipated to be available electronically.

Society for Critical Care Medicine (SCCM)

SCCM recently published *Surviving Sepsis Campaign: Research Priorities for Sepsis and Septic Shock* as a blueprint for sepsis research over the next 5 years. The Surviving Sepsis Campaign is developing its first pediatric guidelines, which should be published in approximately one year. In the past, pediatrics has been addressed briefly, which has been unsatisfying. SCCM has started work on the next version of the adult guidelines. In addition, they are updating a new guideline with IDSA on fever in the intensive care unit (ICU).

Society for Healthcare Epidemiology of America (SHEA)

The SHEA Spring 2019 Conference will be held April 24-26, 2019, in Boston, Massachusetts. There will be 2 certificate courses and the pre-meeting workshop, *Human Factors Engineering for Infection Control*, will continue. A variety of scholarships are available to attend the conference. SHEA is continuing the SHEA Research Scholar program and will award at least 2 research grants to new investigators. The 6th Decennial International Conference on Healthcare Associated Infections will be convened March 26-30, 2020, in Atlanta, Georgia. This conference is a collaborative effort between CDC and SHEA along with a variety of partners, including APIC, IDSA, and partners from outside the US. The last Antimicrobial Stewardship Research Workshop, from a grant from Merck for a total of 3 programs, completed on December 15, 2018. The SHEA Online Education Center launched on April 18, 2018. This resource houses all of the online training offered through SHEA and is available to SHEA members and non-members. The *Primer on Healthcare Epidemiology, Infection Control and Antimicrobial Stewardship* that has been in place for 3 years is undergoing an update, with the new version set to launch in early 2019. Rather than guidelines, SHEA now publishes expert guidance due to the challenges associated with evidence and research. The SHEA/CDC Outbreak Response Training Program (ORTP) Toolkits are available online. The *SHEA Expert Guidance: Infection Prevention in Anesthesia Expert Guidance* has been accepted for publication in *Infection Control and Hospital Epidemiology (ICHE)*. A variety of guidelines are in development, and the Guidelines Committee reviewed a number of published documents in 2018 to assess items that SHEA endorses from other societies and those that need updates. In terms of policy, SHEA launched an online Advocacy Toolkit for grassroots advocates to engage in advocating for HAI prevention. The 4th Edition of SHEA's major textbook, *Practical Healthcare Epidemiology*, was published in Spring

2018. SHEA's new *ICHE* Managing Editor is Lindsay MacMurray. Their Executive Director will be leaving for a new opportunity, so SHEA is recruiting for that position.

Society of Hospital Medicine (SHM)

SHM continues to promote the *Fight the Resistance Campaign*. SHM's High-Value Care Subcommittee is currently developing the second iteration of the *Choosing Wisely* topics. The Quality Improvement Strategy Subcommittee is developing 4 educational online modules to educate SHM members on best practices for implementing quality improvement projects geared toward improving 4 of the topics: CAUTI, Blood Transfusion, Laboratory Testing, and Telemetry.

Surgical Infection Society (SIS)

SIS provided a written report.

(US Department of) Veterans Affairs (VA)

The VA cannot use the CDC SIR formula for *C. difficile* because VA hospitals are different, primarily by site. Therefore, VA revised the formula to fit their needs and included test type, because it did make a difference. Most, but not all, VA hospitals use molecular testing. The second issue is a new option for NHSN: the VA's goal is to automate NHSN. Most of the hospitals are now on board. Some of the remaining hospitals are in validation, which takes a fair amount of time, but all hospitals should be on board soon. The VA is involved in numerous other efforts as well.

Adjourn

With no additional comments or questions posed, HICPAC stood in recess at 4:45 pm.

Friday, November 16, 2018

Welcome and Roll Call

Ms. Stone called the second day of the HICPAC meeting to order at 9:11 am on Friday, November 16, 2018. A roll call of HICPAC members, *ex officio* members, and Liaison Representatives established that there were no new conflicts of interest and that a quorum was present. Quorum was maintained throughout the day.

Dr. Bell recognized HICPAC members whose tenure on the committee was ending. He emphasized that the work and the value of HICPAC rests upon the quality of its members, *ex officios*, and Liaison Representatives. Without their perspectives, CDC would lack significant input and information. HICPAC not only advises CDC's current initiatives, but also impacts the agency's future directions, visions, and context. Dr. Bell thanked the departing members for their commitment to, and investment in, CDC:

- Ms. Vickie Brown
- Dr. Daniel Diekema
- Dr. Selwyn Rogers

Infection Control in Healthcare Personnel Guideline Workgroup Update

Hilary M. Babcock, MD, MPH

Chair, Infection Control in Healthcare Personnel Guideline Workgroup

The Infection Control in Healthcare Personnel Guideline Workgroup ("HCP Workgroup") is updating the 1998 *Guideline for infection control in healthcare personnel*. The Workgroup's charge is to focus on pathogen-specific issues for infection control in HCP. Where information is

out of date, the Workgroup will make updates using evidence-based methods where evidence is available.

The draft *Section 1: Infrastructure and Routine Practices for Occupational Infection Prevention Services* (“Section 1”) was announced in the *Federal Register* and posted to Regulations.gov (www.regulations.gov) for public comment on October 15, 2018. The comment period closes on December 14, 2018. Comments and responses will be collected and discussed at a public HICPAC meeting, and the draft of Section 1 will be revised accordingly.

The Workgroup continues its work on the pathogen-specific sections in *Section 2: Epidemiology and Prevention of Selected Infections Transmitted Among HCP and Patients*.

- The draft Pertussis section was approved by HICPAC in February 2018.
- The draft Mumps and Rubella sections were approved by HICPAC in May 2018.
- The draft Measles section was approved by HICPAC in August 2018.
- Preliminary draft Varicella and Meningococcal Disease recommendations were shared with HICPAC in August 2018.

The methodology for updating the pathogen sections differs from prior guideline update approaches. For each pathogen, the Workgroup reviews the 1998 text and recommendations to assess elements that can be deleted, updated, or retained. The Workgroup focuses on:

- Outdated recommendations that are already updated in other CDC guidelines, such as ACIP recommendations;
- Areas with significant gaps between the 1998 recommendations and current practice;
- Areas with new data or literature that can inform updated recommendations; and
- Areas in which the 1998 guideline does not address an issue that is now common and should be addressed in the update.

The Workgroup works with CDC SMEs for each pathogen to provide feedback on gaps, needed updates, and available literature. The Workgroup then determines whether a full systematic review, an informal review, or a simple update is required for the pathogen.

Thus far, *S. aureus* is the only pathogen section requiring a systematic review. That literature review is ongoing. When a systematic review is needed, the Workgroup develops Key Questions that are approved by HICPAC, and the review is conducted. For pathogens with little to no new information, data, or literature, most recommendations are based on less-formal reviews, expert opinion, other relevant guidelines, and harmonization with existing recommendations. As always, the Workgroup aims for practical, thoughtful guidance that will be helpful when little directly applicable literature may be available.

Some areas within Occupational Medicine for HCP are addressed in the *HICPAC Core Practices Document: 8. Occupational Health* and will not be repeated in every pathogen section of the updated *Guideline for Infection Control in Healthcare Personnel*:

- 1) 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.
- 2) Implement processes and sick leave policies to encourage healthcare personnel to stay home when they develop signs or symptoms of acute infectious illness (eg, fever, cough, diarrhea, vomiting, or draining skin lesions) to prevent spreading their infections to patients and other healthcare personnel.

- 3) Implement a system for healthcare personnel to report signs, symptoms, and diagnosed illnesses that may represent a risk to their patients and coworkers to their supervisor or healthcare facility staff who are responsible for occupational health.
- 4) Adhere to federal and state standards and directives applicable to protecting healthcare workers against transmission of infectious agents including OSHA's Bloodborne Pathogens Standard, Personal Protective Equipment Standard, Respiratory Protection standard and TB compliance directive.

The pathogen sections and status follows:

- Bloodborne Pathogens (HIV, HBV, HCV)
- Conjunctivitis: upcoming
- Cytomegalovirus: upcoming
- Diphtheria: in progress
- Acute GI Infections (Norovirus, *C. difficile*, others)
- Hepatitis A
- Herpes Simplex
- Measles: in progress, HICPAC approved draft
- Meningococcal Disease: in progress
- Multidrug-Resistant Gram-Negative Bacteria
- Mumps: in progress, HICPAC approved draft
- Parvovirus: upcoming
- Pertussis: in progress, HICPAC approved draft
- Poliomyelitis: upcoming
- Rabies
- Rubella: in progress, HICPAC approved draft
- Scabies and Pediculosis
- *Staphylococcus aureus* (MSSA/MRSA): in progress
- *Streptococcus* (group A): in progress
- Tuberculosis
- Vaccinia
- Varicella: in progress
- Viral Respiratory Infections (Influenza, respiratory syncytial virus (RSV), others): in progress
- Potential Agents of Bioterrorism (eg, Anthrax)

S. aureus

The *S. aureus* Key Questions are:

In healthcare settings without a concurrent MRSA/MSSA outbreak or transmission between patients, patients and HCP, or HCP to HCP:

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

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

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

The *S. aureus* literature review identified 3971 articles. Of these, 3464 were excluded at the title and abstract screen stage and 321 were excluded at the full text review stage. Of the remainder, 124 are included for extraction. These articles apply to the Key Questions:

- Question 1: 0
- Question 2: 11 articles, aggregated for Workgroup review
- Question 3: 6 articles, aggregated for Workgroup review
- Question 4: 113 articles, aggregation underway
- Question 5: 0

The Workgroup is reviewing these articles to ensure that each describes a clear timeline of when an intervention or interventions was implemented, and which outcomes can be evaluated. It is difficult to assess the time course between an event, intervention, and outcome for some articles that seem relevant, making it challenging to attribute causation.

Viral Respiratory Pathogens

The Workgroup developed the following questions using the PICO (patient, intervention, comparison, outcome) approach to help guide an exploratory search of the existing literature:

- **Q1.** What is the degree and duration of viral shedding in vaccinated adults compared with unvaccinated adults?
- **Q2.** What is the degree and duration of viral shedding in adults with fever compared to adults without fever?
- **Q3.** What is the degree and duration of viral shedding in adults who have received antiviral treatment compared to adults who have not received antiviral treatment?
- **Q4.** Is there transmission from afebrile and virally shedding adults compared with febrile virally shedding adults?
- **Q5.** What is the degree of transmission when infected healthcare workers wear masks compared to no masks being worn?

The exploratory literature review identified 287 articles. Of these, 273 were excluded at the title and abstract screen stage, and 14 were included for extraction. The evaluation of evidence for each of the questions is in progress:

- Question 1: 1 article
- Question 2: 6 articles
- Question 3: 9 articles
- Question 4: 0 articles
- Question 5: 1 article

Meningococcal Disease

To update the Meningococcal Disease section, the Workgroup reviewed the 1998 recommendations for gaps and outdated recommendations, as well as pertinent recommendations in the 2011 *Immunization of Health-Care Personnel, Recommendations of the Advisory Committee on Immunization Practices (ACIP)* (“ACIP 2011”). “Draft” draft recommendations and a draft narrative section were presented to HICPAC in August 2018.

HICPAC feedback and input from CDC SMEs have been incorporated into the draft recommendations and narrative.

Dr. Babcock presented the 1998 Meningococcal Disease recommendations, followed by the draft updates:

1998 Recommendations

- a. Do not routinely administer meningococcal vaccine to health care personnel. **Category IB**
- b. Consider vaccination of laboratory personnel who are routinely exposed to *N. meningitidis* in solutions that may be aerosolized (Table 1). **Category IB**

DRAFT Update

Delete: Narrative will refer to *ACIP 2011 Recommendations for Immunization of Healthcare Personnel*, to current CDC recommendations, and to the *HICPAC Core Practices Document*.

- **ACIP 2011:** “Healthcare facilities and other organizations should consider including in their vaccination programs vaccines to prevent meningococcal disease ...”
- **ACIP 2011:** “Clinical microbiologists and research microbiologists who might be exposed routinely to isolates of *N. meningitidis* should receive a single dose of MCV4 and receive a booster dose every 5 years if they remain at increased risk.” ***updated May 2017**
- **HICPAC Core Practices**, Section 8 Occupational Health: “1. 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.”

1998 Recommendation

- c. Immediately offer antimicrobial prophylaxis to personnel who have had intensive close contact (eg, mouth-to-mouth resuscitation, endotracheal intubation, endotracheal tube management) with a patient with meningococcal disease before administration of antibiotics without the use of proper precautions (Table 1). **Category IB**

DRAFT Update

- a. Administer antimicrobial prophylaxis to healthcare personnel, regardless of vaccination status, who have had an exposure to *Neisseria meningitidis* (*N. meningitidis*).

1998 Recommendations

- d. Do not routinely give quadrivalent A,C,Y,W135 meningococcal vaccines for postexposure prophylaxis (Table 1). **Category II**
- e. Administer meningococcal vaccine to personnel (and other persons likely to have contact with infected persons) to control serogroup C outbreaks after consultation with public health authorities. **Category IB**
- f. Consider pre-exposure vaccination of laboratory personnel who routinely handle soluble preparations of *N. meningitidis*. **Category II**

DRAFT Update

Delete: Narrative will refer to ACIP/CDC vaccination recommendations and resources for meningococcal disease outbreaks.

1998 Recommendations

- g. Exclude personnel with *N. meningitidis* infections from duty until 24 hours after the start of effective therapy. Do not routinely exclude personnel from duty who only have nasopharyngeal carriage of *N. meningitidis*. **Category IA**

DRAFT Update

- b. Exclude healthcare personnel with *N. meningitidis* infection from work until 24 hours after the start of effective antimicrobial therapy.
- c. Work restrictions are not necessary for healthcare personnel who only have nasopharyngeal carriage of *N. meningitidis*.

In general, the narrative outline of each updated pathogen section is:

- Background
 - Prevention of transmission in healthcare settings
- Occupational Exposures
- Clinical Features
- Diagnosis and Testing
- Postexposure prophylaxis

DRAFT Narrative: Occupational Exposure

“*N. meningitidis* can be transmitted person-to-person through unprotected direct contact with the respiratory secretions or saliva of a person with clinical disease. Exposures in healthcare may include mucous membrane contact with infectious secretions and activities such as mouth-to-mouth resuscitation, endotracheal tube placement or management, or airway suctioning while not wearing or correctly using recommended personal protective equipment (PPE). Brief, non-face-to-face contact, such as standing in the doorway of a patient’s room, cleaning a patient’s room, or delivering a food tray or medication, is generally not considered an exposure.

“Exposures to *N. meningitidis* in laboratory settings are described in *Biosafety in Microbiological and Biomedical Laboratories (BMBL), 5th Edition*, on the CDC website [link].”

Diphtheria

Dr. Babcock presented “draft” draft recommendations for Diphtheria for HICPAC’s input and feedback. To develop the draft recommendations and narrative, the Workgroup reviewed the 1998 recommendations for gaps and outdated recommendations as well as CDC resources from ACIP and the Division of Bacterial Diseases, including the Information for Close Contacts Worksheet (<https://www.cdc.gov/diphtheria/downloads/close-contacts.pdf>). The Workgroup also reached out to CDC SMEs for input.

1998 Recommendation

- a. Encourage vaccination with Td every 10 years for health care personnel (Table 1) (9,19).
Category IB

DRAFT Update

Delete: Narrative will refer to ACIP 2011 *Recommendations for Immunization of Healthcare Personnel* and to CDC recommendations for adult vaccine schedules.

- **Draft Narrative, Background:** “Prevention of transmission of *Corynebacterium diphtheriae* (*C. diphtheriae*) in healthcare settings involves (a) encouraging vaccination of healthcare personnel against diphtheria in compliance with routine adult vaccine schedules; ...”
- **ACIP:** “**Tetanus and diphtheria toxoids (Td).** All adults should have documentation of having received an age-appropriate series of Td-containing vaccine and a routine booster dose every 10 years...”
- **HICPAC Core Practices, Section 8 Occupational Health:** “1. 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."

1998 Recommendations

- b. Obtain nasopharyngeal cultures from exposed personnel and monitor for signs and symptoms of diphtheria for 7 days after exposure (149). **Category IB**
- c. Administer antimicrobial prophylaxis to personnel who have contact with respiratory droplets or cutaneous lesions of patients infected with diphtheria. Also administer a dose of Td to previously immunized exposed personnel who have not been vaccinated within the previous 5 years (Table 1) (19,149). **Category IB**
- d. Repeat nasopharyngeal cultures of personnel found to have positive cultures at least 2 weeks after completion of antimicrobial therapy. Repeat antimicrobial therapy if personnel remain culture positive (149). **Category IB**
- e. Exclude exposed personnel and those identified as asymptomatic carriers from duty until antimicrobial therapy is completed and results of two nasopharyngeal cultures obtained at least 24 hours apart are negative (Table 3) (149). **Category IB**

DRAFT Update

- a. For healthcare personnel who have an exposure to diphtheria, regardless of vaccination status,
 1. Administer postexposure prophylaxis in accordance with CDC recommendations
 2. Implement daily monitoring for the development of signs and symptoms of diphtheria for 7 days after their last exposure
 3. Exclude from work and obtain nasal and pharyngeal swabs for diphtheria culture
 - i. If nasal and pharyngeal cultures are negative for *C. diphtheriae*, healthcare personnel may return to work while completing postexposure antibiotic therapy
 - ii. If nasal or pharyngeal cultures are positive for *C. diphtheriae*,
 - a. Complete postexposure antibiotic therapy
 - b. Healthcare personnel may return to work when:
 1. postexposure antibiotic therapy is completed AND
 2. at least 24 hours after completion of postexposure antibiotic therapy, two nasal and pharyngeal cultures for diphtheria obtained at least 24 hours apart are negative
- b. For healthcare personnel with diphtheria infection, exclude from work until
 1. antibiotic and antitoxin therapy are completed AND
 2. at least 24 hours after completion of antibiotic therapy, two nasal and pharyngeal cultures for diphtheria obtained at least 24 hours apart are negative

DRAFT Narrative: Occupational Exposure

"Transmission of diphtheria occurs through deposition of respiratory, oral, or nasal secretions from an infected source person, discharge from skin lesions, or, rarely, fomites on the mucus membranes of a susceptible host. Unprotected (ie, not wearing a facemask), close contact with an infectious source person or their secretions may be considered an exposure to diphtheria. Close contact may include, but is not limited to, performing a physical examination on, feeding, or bathing a patient; bronchoscopy; intubation; or administration of bronchodilators.

"Exposure to cutaneous diphtheria lesions may include, but is not limited to, unprotected contact with the lesions or their drainage, such as when changing

lesion dressings or handling potentially infectious secretions without wearing recommended PPE (ie, gown and gloves).”

DRAFT Narrative: Postexposure Prophylaxis

“Postexposure prophylaxis for diphtheria includes receipt of diphtheria vaccine and a single dose of intramuscular benzathine penicillin G or a 7-to 10-day course of oral erythromycin. Detailed information regarding the dosage and administration of postexposure vaccine and antimicrobial therapy is available on the CDC website [link].

“Administration of postexposure prophylaxis does not always eliminate the carrier state. For HCP identified as *C. diphtheriae* carriers, positive post-treatment cultures typically prompt administration of additional courses of treatment. The CDC website provides additional information on the management of *C. diphtheriae* carriers [link].”

Group A Streptococcus

To draft updated recommendations for Group A *Streptococcus*, the Workgroup reviewed the 1998 recommendations for gaps and outdated recommendations, and current CDC guidelines and recommendations, particularly *Prevention of Invasive Group A Streptococcal Disease among Household Contacts of Case Patients and among Postpartum and Postsurgical Patients: Recommendations from the Centers for Disease Control and Prevention (2002)*. The Workgroup also reached out to CDC SMEs for input.

1998 Recommendations

- a. Obtain appropriate cultures and exclude personnel from patient care or food handling if they have draining lesions that are suspected to be caused by *Streptococcus*. Work restrictions should be maintained until streptococcal infection has been ruled out or personnel have received adequate therapy for 24 hours (Table 3) (369,371,374).

Category IB

- b. Do not routinely exclude personnel with suspected or confirmed carriage of group A *Streptococcus* from patient care or food handling unless it is shown epidemiologically that they are responsible for disseminating the organism in the health care setting (Table 3) (369,373,378). **Category IB**

DRAFT Update

- a. For healthcare personnel with known or suspected Group A *Streptococcus* infection,
 - 1. Obtain culture(s) for Group A *Streptococcus* from the affected site(s)
 - 2. Exclude from work until Group A *Streptococcus* infection is ruled out, or until 24 hours after the start of effective antimicrobial therapy, *provided that any draining skin lesions can be adequately contained and covered*

OR

If lesions cannot be covered (eg, on the hands or face), exclude from work until all lesions are dried and crusted

- b. For healthcare personnel who are colonized with Group A *Streptococcus* and epidemiologically linked to dissemination of the organism in the healthcare setting,
 - 1. Administer chemoprophylaxis in accordance with CDC recommendations
 - 2. Exclude from work until 24 hours after the start of effective antimicrobial therapy
 - 3. Obtain follow-up cultures 7 to 10 days after completion of chemoprophylaxis; if positive, repeat administration of chemoprophylaxis and again exclude from work until 24 hours after the start of effective antimicrobial therapy

- c. Work restrictions are not necessary for healthcare personnel with known or suspected Group A *Streptococcus* colonization, unless they are epidemiologically linked to dissemination of the organism in the healthcare setting.

Next Steps

Work on the updated Varicella section is ongoing. The Workgroup has reviewed the 1998 recommendations for gaps and outdated recommendations and ACIP 2011 recommendations. They have also reached out to CDC SMEs for input. A preliminary version of the recommendations and narrative text update was presented to HICPAC in August 2018.

The Workgroup will continue data evaluation and then develop draft recommendations for the *S. aureus* section. HICPAC feedback will be incorporated into the draft Diphtheria and Group A *Streptococcus* sections. The Workgroup also will continue its work on Influenza and Viral Respiratory Diseases. The next pathogen sections slated for update are: Polio, Parvovirus, cytomegalovirus (CMV), and Adenovirus/Conjunctivitis.

Discussion Points

Meningococcal Disease

CSTE pointed out that meningococcal disease is required to be reported to public health. Further, there are challenges associated with receiving isolates. It is important for public health to assess serotypes, as they can influence the administration of additional vaccinations, such as when a cluster is detected.

Dr. Babcock replied that this Guideline is focused on occupational health services and does not address reporting of cases. Specific reporting requirements have not been included in other sections. The Guideline does not address identifying and caring for a patient with meningococcal disease, but rather managing exposures that may have occurred. The *Core Practices* document states that federal requirements, which include reporting, should be followed.

Regarding exposure, HICPAC suggested including an example of “clinical disease” for better clarity.

Dr. Bell suggested adding examples of occupational exposures that are relevant to physician and clinical professionals in addition to examples that apply to environmental or food service staff.

Dr. Babcock noted that the Workgroup intended to provide broadly-applicable examples of occasions that do not represent an exposure, such as standing in a doorway or delivering medications or trays. The Workgroup will discuss additional examples that specifically invoke clinical workflow.

APIC commented that IPs will use this Guideline to help determine whether an exposure has occurred, and additional examples will be helpful.

ASN observed that use of the word “generally” in the phrase “is generally not considered an exposure” in the Occupational Exposures section could be confusing to the end user. More specific language may be preferable.

There was support among HICPAC members for retaining the word “generally.” For example, a person could be cleaning a patient’s room, go to assist the patient, and be coughed on. There was some discussion about stipulating a distance of 3 feet from the patient, but that number is problematic. This issue is not always “black and white.”

CSTE suggested that the section address contact with respiratory isolates. Public health is frequently contacted regarding whether PEP should be given if *N. meningitidis* has been isolated from sputum or bronchial isolates; greater granularity regarding what is or is not considered an exposure for clinical staff is important, especially given the frequency of administering PEP.

Dr. Babcock emphasized that the Workgroup included examples of exposures that need PEP, such as administering mouth-to-mouth resuscitation, intubation, or airway suctioning. Perhaps additional examples of encounters that would not necessitate PEP could be included as well. The PEP section states that exposure to a patient who only has *N. meningitidis* isolated from a non-sterile site in the absence of clinical disease does not require PEP.

Diphtheria

CSTE observed that the draft recommendations refer strictly to culture and suggested that reference be made to culture-independent diagnostics. Consideration also should be given to mentioning whether documentation of toxin production, which may be delayed, is needed. CSTE approved a modification of the case definition of diphtheria: a confirmed case requires documentation of toxin production from the source patient.

Regarding the recommendation for when HCP can return to work, HICPAC asked whether clearance for work requires 2 nasal *and* 2 pharyngeal cultures to be negative, or whether 2 nasal *or* 2 pharyngeal cultures must be negative. HICPAC further asked whether “nasopharyngeal” cultures could be used.

Dr. Babcock indicated that the Workgroup will check on the points raised by CTSE and HICPAC with the SMEs to verify their intent.

Group A Streptococcus

Regarding the exclusion from work until 24 hours after the start of effective antimicrobial therapy, PIDS indicated that the *2018 Red Book*® recommends that children can return to childcare 12 hours after the initiation of antimicrobial therapy. Two strong studies showed that pharyngeal colonization was eradicated after 12 hours of the first dose of amoxicillin; however, the studies focused only on pharyngitis.

Dr. Babcock indicated that Group A *strep* skin or soft tissue infection is also included in the 24-hour rule. She was not certain whether data are available to support shortening that course, but the exclusion for pharyngitis could be separated from the exclusion for skin or soft tissue infection.

CSTE wondered if guidance should be provided about which anatomical sites to culture, for example, if HCP are epidemiologically linked to postpartum or surgical site infection. Dr. Babcock replied that the narrative will address sites to culture and refer to CDC resources.

HICPAC suggested that the narrative address the importance of following basic Standard Precautions in order to avoid contaminating hands during normal care. Dr. Babcock said that this point is included in the *Core Practices* document but could be reinforced in this section.

Referring to Recommendation b. and its reference to “epidemiologically linked,” HICPAC suggested revising the statement to read “epidemiologically linked to healthcare-associated infection” for clarity.

PIDS suggested broadening the language of Recommendation a. to include molecular testing, given that some facilities are using this type of testing.

PHAC wondered whether Recommendations b. and c. are in the right order. The order could be reversed to state first that work restrictions are generally not required for HCP who are colonized, and then to describe exceptions in subsequent recommendations.

Reflecting on test type, Dr. Bell wondered whether it might be valuable for a perambulatory statement for the entire document to refer to instating work restrictions “until infection is excluded or ruled out,” the specifics of which will vary depending upon the type of testing. Because the field will shift over time, the document will likely become outdated if it is too specific regarding test types.

Dr. Babcock added that for some pathogens, specific test type will be important. For instance, facilities should not rule out influenza via a rapid antigen test. In these cases, the recommendation could state, “until infection is ruled out,” and the narrative could describe which test type to use. With this approach, the recommendation itself will be more timeless, with appropriate detail provided in the narrative. Consideration will be given to this balance.

NIH emphasized caution, especially regarding newer molecular tests, to ensure that they are actually equivalent and that positive cases are epidemiologically linked to the risk of transmission. The differences in results from culture versus results from a new molecular technique may not be related to whether the organism is transmissible. Showing the sensitivity of the test may not be sufficient, and it may be necessary to rely on what is known about transmission.

HICPAC pointed out that often, HCP are tested by their own primary care providers.

AORN appreciated the use of “dissemination of the organism,” given that the environment is a major concern, especially in the surgical setting. Has the Workgroup considered more restrictive guidance for high-risk settings, such as the operating room?

CSTE commented that some providers have moved to solely using culture-independent diagnostic tests with multiplex PCRs and not conducting any culture-based testing. If a culture must be performed, then the Guideline should be specific that other tests are “not acceptable.” Facilities may not understand the implications of the differences between the methods.

Dr. Bell noted, that if these are the primary tests being used, and if their increased sensitivity may lead to excessive exclusion or isolation, it is important to understand this impact on health systems, as well as the potential impact of reverting to culture.

NIH said that this question is challenging. More is known about how closely some tests correlate with finding an organism than others. It is not clear what the implications will be as these tests become more sensitive, and as molecular methods advance.

Dr. Diekema added for many molecular tests with increased sensitivity, an increased sensitivity problem is more related to the population being tested than to an actual increase in sensitivity. In other words, the performance characteristics of the test and the positive and negative predictive value for disease are based upon who gets tested. It may be necessary to incorporate warnings against testing indiscriminately into the Guideline, as well as cautions regarding testing minimally symptomatic HCP and limiting testing to those with the highest likelihood of Group A *strep*. Ironically, advances in technology illustrate the increasing importance of clinical assessment and the application of clinical criteria for disease states.

ACOEM pointed out that consideration must be given to how commonly these exposures occur. For instance, diphtheria has not disappeared from the world, but it also does not present the same burden in American hospitals among HCP that many other exposures present.

CSTE has been consulted to provide advice on group A *Streptococcus*. The implications for HCP who cannot receive clearance to work are significant, and a person’s livelihood can be

affected for some time. Patient safety is critical, but excluding HCP on the basis of a test that looks at “dead organisms” has downstream effects.

Vote: Meningococcal Disease Draft Section

The draft Meningococcal Disease recommendations and narrative were put forth for approval as presented. The vote carried unanimously, with no opposition and no abstentions. The disposition of the vote was as follows:

- **11 Favored:** Babcock, Brown, Bryant, Chopra, Dekker, Diekema, Fauerbach, Huskins, Maragakis, Patterson, Yokoe
- **0 Opposed:** N/A
- **0 Abstained:** N/A

Setting Action Limits for Water Quality in Healthcare

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Centers for Disease Control and Prevention

On Behalf of the DHQP Water Management and HAI Workgroup

Dr. McDonald presented issues associated with potable water and described the DHQP Water Management and HAI Workgroup.

In July 2017, Dr. McDonald presented to HICPAC on the Workgroup’s early activity. Information about water management programs for healthcare facilities can be found on the webpage titled *From Plumbing to Patients*, (<https://www.cdc.gov/hai/prevent/water-management.html>), which addresses the spectrum of use and risk for potable water and drains.

Approximately 20% of DHQP consultations and outbreak investigations in recent years have been water-related, for a range of water uses. The investigations are frequently related to poor microbial water quality of potable and tap water. Water management programs are making strides in awareness and risk assessment, but there is still a need for monitoring guidance and actionable water quality standards that address all hazards in healthcare. While some community standards are in place, such as the Safe Drinking Water Act (SDWA), there is a relative lack of healthcare standards for monitoring and action, which is incongruent with disease risk.

At the July 2017 HICPAC meeting, Dr. McDonald described a *P. aeruginosa* outbreak in California.⁵ This outbreak occurred in a NICU that was built in 2013. Flushing and testing of the water had occurred in February of 2013, with no concerns noted; however, the facility was not occupied until May. In the interim, water sat in the system and no routine testing was conducted. After opening, the facility detected *P. aeruginosa* and suspected that the facility water could be the source. The water was tested, and *P. aeruginosa* was found. Unfortunately, there were several illnesses and 2 deaths in this outbreak. A number of measures were put into place to address the situation, such as removal of aerators, chlorination, and addition of point-of-use filters. Those measures controlled the outbreak, and the facility was following recommendations to perform pre-filter testing, given that some bacteria were still detected over time. The facility replaced the faucets with new models and thought that the problem was solved, but removed the point-of-use filters and did not subsequently perform follow-up testing. *P. aeruginosa*

⁵ *Infect Control Hosp Epidemiol.* 2017 Jul;38(7):801-808. doi: 10.1017/ice.2017.87. Epub 2017 May 18.

returned, and there was another death. Point-of-use filters were replaced, supplemental disinfection was conducted, and residual testing was performed.

Literature is developing pertaining to how programs and plans are applying the CMS Survey and Certification memo on “*Legionella* and other Opportunistic Water Pathogen Prevention.” Work by Dr. Scott Fridkin and colleagues⁶ shows that 53% to 55% of facilities are measuring their pH. This parameter is important because it pertains to the effectiveness of disinfectant, and because it is related to corrosion. Temperature is also important and is monitored in 59% to 64% of facilities. *Legionella* presence is monitored in 55% to 65% of these facilities. Approximately 24% to 27% of facilities monitor for *Legionella pneumophila* (*L. pneumophila*) only. A study⁷ by Danila, et al, on hospital water management programs from Minnesota in 2017 had poorer findings, with lower rates of measurement in general for pH, temperature, and *Legionella*.

The NHSN Annual Survey now includes questions that relate to water management plans. One question pertains to whether facilities regularly monitor disinfectant such as residual chlorine in their building’s water system: slightly more than 50% (N= 2755/5091) of acute care hospitals responded that they are regularly measuring disinfectant residuals in their systems as a measure of water quality. The CMS Memo was released only recently, so perhaps this percentage will improve with time.

However, there is compelling rationale for focusing on the community standard. Several members of the DHQP Workgroup joined a recent conference call with EPA discussing what the SDWA does and does not do. For surface water systems, which account for most medium and large municipalities serving acute care hospitals, residual disinfectant concentration in the water entering the distribution system cannot be less than 0.2 mg/L for more than 4 hours. One sample is required per month from the distribution system for every 1,000 persons served. A heterotrophic plate count (HPC) of <500/ml can be utilized in place of detectable disinfectant. The primary measures are disruption in source, disinfection, and distribution processes; however, distribution metrics also guard against advanced water age. This discussion illuminates general water quality issues, but regular monitoring demonstrates whether a facility has a system that is in control, or a system that has lost control. These are measures of disruption, as well as advanced water age: advanced system age is a “killer” of microbial water quality.

In addition to requirements in the SDWA, microbe-related monitoring of water in distribution systems and plumbing is addressed by American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 188, which requires monitoring of residual disinfectant and hot water. ASHRAE is *Legionella*-focused and uses testing as a means to validate water management plans. It does not address the frequency of testing or how many samples should be collected and tested. ASHRAE Guideline 12 is a modification of 188.

The CDC Environmental Infection Control (EIC) Guideline is silent on residual disinfection, but it does specify a temperature of > 51°C for hot water and < 20°C for cold water due to the effect of temperature on *Legionella* growth. The Guideline requires specific microbial testing only in special circumstances or an outbreak investigation and is silent on HPCs. CDC’s *Legionella* Toolkit (<https://www.cdc.gov/legionella/wmp/toolkit/index.html>) is intended to serve as a

⁶ M. Ehret, Karen & T. Chamberlain, Allison & L. Berkelman, Ruth & K. Fridkin, Scott. (2018). “Preventing hospital-acquired Legionnaires’ disease: A snapshot of clinical practices and water management approaches in US acute-care hospitals.” *Infection Control & Hospital Epidemiology*. 1-3. 10.1017/ice.2018.240

⁷ Danila, R., Koranteng, N., Como-Sabetti, K., Robinson, T., & Laine, E. (2018). “Hospital Water Management Programs for *Legionella* Prevention, Minnesota, 2017.” *Infection Control & Hospital Epidemiology*, 39(3), 336-338. doi:10.1017/ice.2017.310

translation of ASHRAE 188. The toolkit discusses routine testing in the context of explaining what the validation of a water management program might be.

In addition, a VA Directive⁸ was instituted approximately 2 years ago requiring that all buildings in the VA healthcare system continuously monitor for pressure, temperature, pH, solids (which can consume disinfectant), and oxidant. Cold and hot water temperature requirements are specified. Quarterly testing is required of tap water for growth of *L. pneumophila*, residual disinfectant, and pH. In general, the following minimum detected oxidant residual levels at hot and cold water outlets are suggested as guidance:

- 0.5 milligrams (mg) per liter (L) for chlorine (as free chlorine)
- 0.5 mg/L for monochloramine
- 0.3 mg/L for chlorine dioxide

Water samples from at least 10 outlets on the hot water distribution system and at least 10 outlets on the cold water distribution system must be tested from each building for each quarterly testing cycle.

CDC's *Legionella* webpage (<https://www.cdc.gov/legionella/wmp/monitor-water.html>) provides information about monitoring water quality parameters, routine environmental sampling, sampling plans and approaches, and taking corrective action when *Legionella* is found. Examples are provided of chemical and physical control limits to reduce the risk of Legionella growth, which include the following and were not intended to go beyond ASHRAE 188:

- Maintain hot water temperature at the highest temperature allowable by state regulations or codes (see guidance for healthcare-specific recommendations (<https://www.cdc.gov/legionella/wmp/monitor-water-guidance.html>)).
- Ensure disinfectant levels are detectable where water enters the building and at points of use.
- Measure the pH of the water to determine whether the disinfectant used in the building will be effective. Disinfectants work best within a narrow pH range (see parameter conditions indicating operational effectiveness (<https://www.cdc.gov/legionella/wmp/monitor-water-guidance.html>)).

Some gaps are observed in these guidelines and regulations. The SWDA provides specific monitoring and action metrics for monitoring initial water quality and the water age in the municipal distribution system. ASHRAE 188 has a general building focus with a healthcare annex; validation is *Legionella*-focused, though it mentions disinfectants; and has no specificity on periodicity or monitoring sites. While there has been discussion regarding NSF 444 as the potential next step to offer further definition, this effort has been indefinitely delayed. Other guidance is available, such as WHO's "Water Safety in Buildings" publication (https://www.who.int/water_sanitation_health/publications/2011/9789241548106/en/). This guidance is similar to the others, but lacks specificity. The UK Department of Health and Social Care published a Health Technical Memorandum titled "Safe Water in Healthcare Premises (HTM 04-01)" (<https://www.gov.uk/government/publications/hot-and-cold-water-supply-storage-and-distribution-systems-for-healthcare-premises>) for augmented care units that addresses how to sample specifically for *P. aeruginosa* in potable water at points of use, provides a method for performing the specific microbe testing, and includes action limits.

Maintaining and monitoring water quality in either a distribution system or in premise plumbing of a hospital is important to guard against or to detect advanced water age and increased biofilm, and to discern whatever led to it. These problems kill water microbial quality in the

⁸ VA Directive 1061. https://www.va.gov/vhapublications/ViewPublication.asp?pub_ID=3033

distribution system and result in the potential for increased patient risk. A number of other factors improve or reduce water quality:

Improve Quality	Reduce Quality
<ul style="list-style-type: none"> • Flushing (reduces water age) • Supplemental disinfectant (overcomes biofilm and age) • Point of use filtration • Temperature (makes less hospitable) <ul style="list-style-type: none"> – Cold < 20°C – Hot >50°C 	<ul style="list-style-type: none"> • Pipe materials • Aerators (increase surface area and trap pieces of biofilm that has broken off) • Poor faucet design (too much surface area; increases biofilm) • Corrosion (increases surface area) • Low initial disinfectant level • Dead legs (add advanced age)

The DHQP Water Management and HAI Workgroup suggested the general assumption, which their EPA colleagues felt was reasonable, that in a shorter leg of a municipal distribution system, the type of monitoring required by the SDWA may assure higher water quality, on average, than in buildings such as hospitals if there is no standardized monitoring. For example, the monitoring that occurs in the distribution system supplying a water fountain in a municipal park probably assures a higher water quality than can be assured in a variety of medical facility locations. The DHQP Workgroup sees this opportunity to move the field forward by generating minimum monitoring practices. To that end, the DHQP Workgroup requests HICPAC engagement with them and other groups that are involved in this effort to make water monitoring recommendations that address the following key features:

- What is monitored?
- Where is it monitored?
- How often is it monitored (frequency)?
- Routine or only triggered by risk assessment?
- What are the action limits or standards?
- Should what is monitored, the frequency, or action limits depend upon patient population risks?
- Should frequency depend upon the history of previous results, building age, or other water distribution factors?
- Should monitoring and action standards based upon a SDWA minimum be applied to tap water in hospitals?

For example, should CDC, as an initial minimum standard, make an all-hazard recommendation for acute care hospitals, in addition to current regional validation of water management programs and plans, to perform quarterly routine monitoring of tap water in all patient care locations for detectable disinfectant and pH? Should a recommendation state to rotate 10 site hot and cold water samples from all patient care locations, or recommend additional testing for higher-risk patient populations, such as burn units, NICUs, transplant, oncology, adult ICUs, etc? The recreational water standards could be the foundation for additional testing in these areas. There are recreational water standards for *Pseudomonas* in recreational waters in the US, but not for *Pseudomonas* from a tap in the NICU or ICU. Recommendations for follow-up or next-step testing could be included, such as testing for HPCs at sites where no disinfectant is detected.

Dr. McDonald noted several groups at CDC that are intensely interested and involved in water issues:

- DHQP Water Management and HAI Workgroup

- Division of Foodborne, Waterborne, and Environmental Diseases (DFWED)
- NCIRD, Division of Bacterial Diseases (DBD)
- National Center for Environmental Health (NCEH), Division of Environmental Health Science and Practice (DEHSP)

Discussion Points

NIH was intrigued by the list of issues, one of which was building age. It is important to note the significant problems found in new, “green” buildings.

HICPAC commented on the opportunity for healthcare facilities to think about how best to protect their patients. In terms of the focus on just water monitoring, a recent article in *ICHE* described an ICU with healthcare-associated transmission of gram-negative infections from the sink system. The facility engaged significant mitigation, testing, etc, with a focus on essentially sterilizing the water. Yet, none of those efforts were successful: the bacteria always returned. The only successful effort was instituting specific mitigation strategies focused on protecting the counter from the sink and minimizing use of water. This result raises concerns about the focus on monitoring as opposed to a broader mitigation strategy, although monitoring may be part of such a strategy.

There was general HICPAC support for broadening standards beyond just testing the water to address system factors (eg, faucets, pipes, sink locations, counters, etc), examining how tap water is used and tap water sources close to the patient, considering water disruption and rain events, and moving to a more proactive stance versus being reactive to outbreaks.

Dr. McDonald agreed and noted that the EIC guidance describes surveillance for evidence of harm before testing the water. The other aspect of this work is the question of what to do when something problematic is found in the water: then how much harder do you look? The challenge with *Legionella* testing is its 7-day or 10-day incubation period. *P. aeruginosa* is especially concerning when it is “mixed” in with the usual *Pseudomonas*. Concerns include person-to-person transmission and, occasionally, resistance markers. He agreed that for some problems with sink drains, the only solution is to interrupt the transmission more distally. It is important to avoid simply driving toward sterilizing the water. At the same time, people who can improve their water should do so.

VA indicated that this work has been ongoing for some time in VA facilities. A notable problem is scalding, particularly in long-term care facilities where many of these clusters of *Legionella* occur. Another problem is associated with waiting for guidance. Do you wait until there is enough evidence to do something? There rarely is enough evidence. Waiting for an outbreak is a “failure first” approach, and the VA does not like that thought. The MRSA guidelines were published without evidence that they would work, and it was a burden, but they turned out to work dramatically. Their *C. difficile* guidelines are challenging and slower, but they appear to be working. With *Legionella*, they also did not wait for published guidelines recommending routine monitoring and yet their actions appear to be having an effect. Last year was a bad *Legionella* year throughout the country, but in terms of inpatients, VA’s case numbers actually decreased. They are confident that they are not missing cases because they perform thousands of tests. In terms of hospitals that fail, improve, continuously lapse, or stay improved, a successful water program requires “tinkering.” The facilities with problems that have continuously stayed in good order have personnel who are interested in these issues and who are able to maintain a program. Most hospitals do not have personnel who are experts in plumbing and water: Chief Engineers are not these experts, and Water Engineers are difficult to find and expensive to employ. The key is to have a water management team with sufficient expertise and sufficient management interest to maintain rigor.

Considerations Related to Eye Protection and Droplet Precautions

Bryan E. Christensen, PhD, MEPC
Industrial Hygienist and Epidemiologist
Consultation and Training Team
Division of Healthcare Quality Promotion
National Center for Emerging and Zoonotic Infectious Diseases
Centers for Disease Control and Prevention

In this discussion of practical considerations related to eye protection and Droplet Precautions, particularly for seasonal influenza and other respiratory viruses, Dr. Christensen asked HICPAC to consider the question, “Should eye protection be included in Droplet Precautions for seasonal influenza and other respiratory viruses?”

HICPAC’s 2007 *Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings* uses this recommendation scheme:

- IA: Strongly recommended for implementation and strongly supported by well-designed experimental, clinical, or epidemiologic studies.
- IB: Strongly recommended for implementation and supported by some experimental, clinical, or epidemiological studies and a strong theoretical rationale.
- IC: Required for implementation as mandated by federal and/or state regulation or standard.

Dr. Christensen presented relevant recommendations from the *Guideline for Isolation Precautions*:

- IV.B.4.a. Mouth, nose, eye protection: Use **PPE** to protect the **mucous membranes of the eyes, nose and mouth** during procedures and patient-care activities that are likely to **generate splashes or sprays** of blood, body fluids, secretions, and excretions (IB/IC)
- IV.B.5. During **aerosol-generating procedures** (eg, bronchoscopy, suctioning of the respiratory tract [if not using in-line suction catheters], endotracheal intubation) in patients who are not suspected of being infected with an agent for which respiratory protection is otherwise recommended (eg, MTB, SARS), **wear** one of the following: a **face shield** that fully covers the front and sides of the face, a **mask with attached shield**, or a **mask and goggles** (in addition to gloves and gown; IB)
- V.A.1. In addition to **Standard Precautions**, use **Transmission-Based Precautions** for patients with documented or suspected infection or colonization with **highly transmissible** or **epidemiologically-important** pathogens for which additional precautions are needed to prevent transmission (1A)
- V.C.2.b. Droplet Precautions, use of PPE: No recommendation for routinely wearing eye protection (eg, goggle or face shield), in addition to a mask, for close contact with patients who require droplet precautions (unresolved issue).
- Droplet Precautions (*without specific guidance about eye protection other than Standard Precautions*) are recommended for:
 - Seasonal influenza: Standard + Droplet
 - Adenovirus pneumonia: Standard + Droplet + Contact

Additional, supporting text related to eye protection as part of face protection for respiratory droplets is provided in the Discussion of Section II.E.3 of the *Guideline for Isolation Precautions*. The discussion addresses earlier studies that associated eye protection with reduced transmission of RSV. It is unknown whether the studies represented hand-eye contact versus

respiratory droplet contact. Subsequent studies showed that goggles were not a necessary part of Standard + Contact precautions for RSV. At the time this guideline was developed, these issues were not studied for other respiratory viruses.

Several interim guidances from CDC incorporate eye protection:

- *Public Health Guidance for Community-Level Preparedness and Response to SARS:* Routinely wear eye protection when within 3 feet of a patient with severe acute respiratory syndrome coronavirus (SARS CoV). If splash or spray of respiratory secretions or other body fluids is likely, protect the eyes with goggles or a face shield, as recommended for Standard Precautions. The face shield should fully cover the front and wrap around the side of the face.
- *Interim Guidance on Infection Prevention and Control (IPC) Measures for 2009-2010 H1N1:* Use gowns along with eye protection for any activity that might generate splash.
- *Interim IPC Guidance for Middle East Respiratory Syndrome (MERS):* Put on eye protection (eg, a disposable face shield) upon entry to the patient room or care area. Remove and discard eye protection immediately upon leaving the patient room or care area.
- *Interim IPC Guidance for Novel Influenza A Viruses Associated with Severe Disease:* Put on eye protection (ie, goggles or face shield) upon entry to the patient room or care area. Remove and discard eye protection immediately upon leaving the patient room or care area.

The current *Prevention Strategies for Seasonal Influenza in Healthcare Settings* states:

- **Adhere to Standard Precautions**
- **Adhere to Droplet Precautions**
- **Use Caution when Performing Aerosol-Generating Procedures**
 - HCP should adhere to Standard Precautions, including wearing gloves, a gown, and either a face shield that fully covers the front and sides of the face or goggles.

In considering the available literature, some of which is dated, several respiratory and ocular issues are important to remember:

- Respiratory virus transmission: aerosols, droplets, fomites
- Nasolacrimal duct
- Transocular transmission of respiratory viruses: RSV, adenovirus, and certain pandemic influenza strains
- Self-inoculation

Respiratory viruses are capable of using the eye as both a site of virus replication and a portal of entry. These viruses can be transmitted by any of 3 possible mechanisms:

1. Small-particle aerosols (<10 μm mass median diameter), which usually are generated by coughing or sneezing and may traverse distances of greater than 6 feet
2. Droplets or large particles (>10 μm mass median diameter), which require close person-to-person contact, usually at a distance of 3 to 9 feet
3. Fomites, which must be able to remain infectious on environmental surfaces to be transferred to the skin, and to remain infectious for a time sufficient to allow self-inoculation into the respiratory tract

Viruses that are generally considered respiratory pathogens are capable of causing ocular complications and establishing respiratory infection following ocular exposure. A review by

Belser, et al,⁹ highlighted these viruses and specifically focused on adenovirus Species D and influenza H7.

A series of studies by Hall^{10,11} shows that RSV inoculation occurs mainly through the eye and nose, rather than through the mouth via large-particle aerosols or droplets, requiring close contact. RSV is able to remain infectious on various environmental surfaces, suggesting fomites as a source of spread. Gloves may be effective in the control of RSV because few persons will touch their noses or rub their eyes while gloved; therefore, the chance for self-inoculation is diminished. Masks, if appropriately used, may act as a barrier for 1 of the 2 most effective sites for inoculation of RSV.

Gala, et al,¹² showed that using eye-nose goggles is beneficial in reducing RSV infections in both infants and staff. This series of studies, which began in 1975, changed infection prevention techniques over time. In 1984 (Period 1), the techniques included eye-nose goggles. In this period, only 6% nosocomial RSV infection of infants and 5% of staff was observed. This percentage is significantly different from other periods when eye protection was not implemented.

In another RSV study,¹³ the use of masks and goggles was associated with a significant reduction of RSV illnesses in pediatric HCP. This study assigned patients with RSV infections to 1 of 2 isolation categories:

1. HCP wore masks and goggles; or
2. HCP did not wear masks and goggles.

The rate of RSV illness in HCP the “mask/goggle” group was 5%, while the illness rate in the “no mask/goggle” group was 61%. RSV illness rates in HCP correlated directly with the number of exposures.

A study by Reed¹⁴ focused on rhinovirus concluded that, based on estimates of virus titers in nasal washings and on fingers and amounts transferred by rubbing, colds are unlikely to spread via objects contaminated by the hands of the virus-shedder. However, a recipient might pick up enough virus on his or her fingers by direct contact with heavily infected skin or secretions to constitute a risk of self-inoculation via the conjunctiva or nostril.

The Belser study⁵ also notes that adenoviruses and avian influenza viruses exploit the presence of α 2-3-linked sialic acids present on the ocular epithelium for receptor-dependent entry into tissue. Similarities in the elicitation of host responses to influenza, RSV, and adenovirus infection of corneal and conjunctival epithelial cells provide some insight into potential shared mechanisms of inflammation following virus infection.

A 2011 study by Bischoff, et al,¹⁵ examined 28 participants in 6 groups who were exposed to monodispersed live attenuated influenza vaccine (LAIV) particles of 4.9 μ m, which is at the “edge” of an aerosol versus a droplet size:

⁹ Belser JA, Rota PA, Tumpey TM. Ocular tropism of respiratory viruses. *MicrobiolMolBiolRev* 2013;77:144–156

¹⁰ Hall CB. Respiratory syncytial virus: its transmission in the hospital environment. *Yale J BiolMed* 1982;55:219–223

¹¹ Hall CB. Nosocomial respiratory syncytial virus infections: the “Cold War” has not ended. *ClinInfect Dis* 2000;31:590–596

¹² Gala CL, Hall CB, Schnabel KC, et al. The use of eye-nose goggles to control nosocomial respiratory syncytial virus infection. *JAMA* 1986;256:2706–8

¹³ Agah R, Cherry JD, Garakian AJ, Chapin M. Respiratory syncytial virus (RSV) infection rate in personnel caring for children with RSV infections. Routine isolation procedure vs routine procedure supplemented by use of masks and goggles. *Am J Dis Child* 1987;141:695–697

¹⁴ Reed SE. An investigation of the possible transmission of rhinovirus colds through indirect contact. *J Hyg (Lond)* 1975;75:249–258

¹⁵ Bischoff, et al. Transocular Entry of Seasonal Influenza–Attenuated Virus Aerosols and the Efficacy of N95 Respirators, Surgical Masks, and Eye Protection in Humans. *JID* 2011;204:193-199

- Group 1: No precautions
- Group 2: Ocular exposure only
- Group 3: Surgical mask without eye protection
- Group 4: Surgical mask with eye protection
- Group 5: Fit-tested N95 respirator without eye protection
- Group 6: Fit-tested N95 respirator with eye protection

Influenza was detected by reverse-transcription polymerase chain reaction (RT-PCR) and culture in nasal washes. The study reports 95% confidence intervals. Groups 1 through 5 saw at least 50% detection of influenza. In Group 6, however, influenza was detected in only 1 of 5 participants. In this study, participants' heads were placed in an aerosol chamber and they were directly exposed to influenza via aerosolization.

In summary, respiratory viruses are unlikely to be transmitted exclusively by aerosol, droplet, or contact. The literature, while limited, suggests that eye protection could be beneficial in preventing respiratory virus transmission.

Dr. Christensen asked HICPAC to reflect on the following questions:

- Should eye protection be included in Droplet Precautions for seasonal influenza and other respiratory viruses?
- Is additional information or research needed?

Discussion Points

HICPAC Feedback

The evidence provided justifies the addition of eye protection to pathogen-specific guidance.

Often in the case of a new and emerging pathogen about which information is limited, precaution recommendations are “scaled up,” as with certain recommendations for using N95 respirators. After scaling up, however, facilities are not always successful at “scaling down,” or re-baselining. Respiratory protection with a mask provides protection for HCP.

The interesting data presented show potential for eye transmission. Similar to the discussion regarding small-particle aerosols, the degree of additional protection provided by scaling up to an N95 versus a droplet precautions mask is unclear. The contribution of transmission through an ocular route to the primary route of droplet deposition onto nose and mouth also is unclear.

When considering the Bischoff data, it is helpful to consider the study methods carefully. Study participants were in a chamber, and influenza was aerosolized at them. It is no surprise, therefore, that influenza was detected in some participants. The study does not entirely inform what occurs when a person with influenza sneezes in an open space with more dispersal, airflow, and other factors. While these types of studies are informative and interesting, it is not clear that they are sufficient to institute a broad change in recommendations for all respiratory viruses, all of the time, for everyone.

When education is delivered on infection prevention measures, Standard Precautions are emphasized, and examples are provided for “splash” or “splatter” that might occur in a routine setting, for example, from a person with a productive cough. If HCP need to wear masks, then the eyes should probably be protected as well. Perhaps rather than adding eye protection to Droplet Precautions, more emphasis could be placed on considerations for eye protection within Standard Precautions.

It can be helpful to consider the population that is ill. An adult can actively cover a cough, but a coughing baby or child is more likely not to cover the cough, spraying those in close contact. Teaching HCP how to assess the patient population, including their proximity and likelihood of

contaminating the HCP facial area, could be beneficial for selecting a method of protection. Pediatric Respiratory Precautions could conceivably be a category of its own.

The importance of Standard Precautions must be conveyed strongly and simply to HCP, because many do not comply with them. Not wearing eye protection is one of the leading issues, as is needlesticks. Research from the Ebola experience regarding PPE and self-contamination of HCP could be relevant beyond Ebola and could be used to improve PPE practices for all pathogens, convincing HCP how much they contaminate themselves.

General Responses/Observations

Dr. Bell observed that the existing Droplet Precautions do not require eye protection. Yet, for emerging issues, such as MERS, SARS, or severe influenza, guidance states that eyes should be protected. That discordance raises questions about the rationale and credibility of the precautions. He wondered whether Droplet Precautions should require eye protection, recognizing that eye protection is inconvenient. Alternatively, he wondered whether Droplet Precautions should only exist for certain high-risk pathogens, and only Standard Precautions, Contact Isolation, and Airborne Isolation should be routinely utilized. This approach is interesting not only for internal consistency, but also due to changes in how infections are diagnosed. With rapid testing, multiplex testing, etc, specific results are retrieved quickly, leading to the follow-on question of, “and therefore, what?” The answer to that question could be syndromic and incorporate risk assessment. Recalling Ms. Stone’s presentation on Guideline Development on the previous day of the meeting, he is not convinced that a virus-by-virus process is optimal for implementation and effective systematization. Differences among healthcare activities and among ill populations are important to consider and are related to the concept of risk assessment for precautions in healthcare.

In response to an observation that consistency might require gown, gloves, mask, and eye protection for every respiratory virus, Dr. Bell commented on the potential opportunity to rethink Contact Isolation. Given the years of “pushback” and the occasional need for guards to enforce it, perhaps Contact Isolation “asks for the wrong things.” A category just short of full Contact Isolation could work well, with Contact Precautions for specific, less common pathogens. This idea could have a health systems impact, considering Droplet Precautions as an augmentation of isolation that is less intensive than Airborne or true Contact.

Dr. Diekema said that given that Appendix A of the *Guideline for Isolation Precautions* is the most visited page and most downloaded HICPAC document, there are opportunities for re-evaluation in the multiplex era to think more broadly about Isolation Precautions, PPE, and other issues.

Closing Remarks and Adjourn

Dr. Diekema thanked HICPAC members, *ex officio* members, Liaison Representatives, Workgroup members, and CDC personnel for their hard work. HICPAC has strong forward momentum.

With no additional comments or questions posed, the meeting was adjourned at 11:56 am.

Certification

I hereby certify that, to the best of my knowledge and ability, the foregoing summary of the November 15-16, 2018, meeting of the Healthcare Infection Control Practices Advisory Committee, CDC are accurate and complete.

Date

Daniel Diekema, MD
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 and Abbreviations

Acronym	Expansion
AAP	American Academy of Pediatrics
ACIP	Advisory Committee on Immunization Practices
ACOEM	American College of Occupational and Environmental Medicine
AEH	America's Essential Hospitals
AHRQ	Agency for Healthcare Research and Quality
AI	Artificial Intelligence
AMR	Antimicrobial Resistance
ANA	American Nurses Association
AORN	Association of periOperative Registered Nurses
APIC	Association of Professionals of Infection Control and Epidemiology
AR	Antibiotic Resistance
ARLN or AR Lab Network	Antibiotic Resistance Laboratory Network
ARSTF	Antimicrobial Resistance Surveillance Task Force
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASN	American Society of Nephrology
ASTHO	Association of State and Territorial Health Officials
BARDA	Biomedical Advanced Research and Development Authority
BMBL	Biosafety in Microbiological and Biomedical Laboratories
BSI	Bloodstream Infection
<i>C. auris</i>	<i>Candida auris</i>
<i>C. difficile</i>	<i>Clostridioides difficile</i>
<i>C. diphtheriae</i>	<i>Corynebacterium diphtheriae</i>
CARSS	<i>Canadian Antimicrobial Resistance Surveillance System</i>
CAUTI	Catheter-Associated Urinary Tract Infection
CDC	Centers for Disease Control and Prevention
CDI	<i>Clostridioides difficile</i> Infection
CHG	Chlorhexidine Gluconate
CLABSI	Central Line-Associated Bloodstream Infection
CMS	Centers for Medicare and Medicaid Services
CMV	Cytomegalovirus
CNISP	<i>Canadian Nosocomial Infections Prevention Surveillance Program</i>
CoE	Centers of Excellence
CORHA	Council for Outbreak Response: Healthcare-Associated Infections and Antibiotic-Resistant Pathogens
CPIP	Canadian Influenza Preparedness Plan
CPO	Carbapenemase-Producing Organism
CRE	Carbapenem-Resistant <i>Enterobacteriaceae</i>
CRPA	Carbapenem-Resistant <i>Pseudomonas aeruginosa</i>
CSTE	Council of State and Territorial Epidemiologists
DBD	Division of Bacterial Diseases
DEHSP	Division of Environmental Health Science and Practice
DFO	Designated Federal Official
DFWED	Division of Foodborne, Waterborne, and Environmental Diseases
DHQP	Division of Healthcare Quality Promotion
<i>E. coli</i>	<i>Escherichia coli</i>

Acronym	Expansion
ECDC	European Centre for Disease Prevention and Control
ED	Emergency Department
EIA	Enzyme Immunoassays
EIC	Environmental Infection Control
EIP	Emerging Infections Program
EPA	Environmental Health Protection Agency
FDA	(United States) Food and Drug Administration
FORHP	Federal Office of Rural Health Policy
GI	Gastrointestinal
GRADE	Grading of Recommendations, Assessment, Development and Evaluation
HAI	Healthcare-Associated Infection
HCP	Healthcare Personnel
HHS	(United States Department of) Health and Human Services
HICPAC	Healthcare Infection Control Practices Advisory Committee
HIIN	Hospital Improvement Innovation Network
HIV	Human Immunodeficiency Virus
HOB	Hospital-Onset Bacteremia
HPC	Heterotrophic Plate Count
HRSA	Health Resources and Services Administration
ICHE	Infection Control and Hospital Epidemiology
ICU	Intensive Care Unit
IDSA	Infectious Diseases Society of America
IFU	Instructions for Use
IOM	Institute of Medicine
IP	Infection Preventionist
IPC	Infection Prevention and Control
IV	Intravenous
<i>L. pneumophila</i>	<i>Legionella pneumophila</i>
MAUDE	Manufacturer and User Facility Device Experience Database
MERS	Middle East Respiratory Syndrome
MeSH	Medical Subject Headings
MIPS	Merit-based Incentive Payment System
<i>MMWR</i>	<i>Morbidity and Mortality Weekly Report</i>
MRSA	Methicillin-Resistant <i>Staphylococcus aureus</i>
MSSA	Methicillin-Susceptible <i>Staphylococcus aureus</i>
<i>N. meningitidis</i>	<i>Neisseria meningitidis</i>
NAAT	Nucleic Acid Amplification Test
NACCHO	National Association of County and City Health Officials
NAC-IPC	National Advisory Committee on Infection Prevention and Control
NCEH	National Center for Environmental Health
NCEZID	National Center for Emerging and Zoonotic Infectious Diseases
<i>NEJM</i>	<i>New England Journal of Medicine</i>
NGC	National Guideline Clearinghouse™
NHSN	National Healthcare Safety Network
NICU	Neonatal Intensive Care Unit
NIH	National Institutes of Health
NTCA	National Tuberculosis Controllers Association
ORTP	(SHEA) Outbreak Response Training Program

Acronym	Expansion
<i>P. aeruginosa</i>	<i>Pseudomonas Aeruginosa</i>
PCR	Polymerase Chain Reaction
PEP	Post-Exposure Prophylaxis
PHAC	Public Health Agency of Canada
PICC	Peripherally Inserted Central Catheters
PICO	Patient, Intervention, Comparison, Outcome
PIDS	Pediatric Infectious Disease Society
PMA	Pre-Market Approval
PPE	Personal Protective Equipment
PWID	People Who Inject Drugs
RCT	Randomized Controlled Trial
RSV	Respiratory Syncytial Virus
RT-PCR	Reverse-Transcription Polymerase Chain Reaction
<i>S. aureus</i>	<i>Staphylococcus aureus</i>
SARS CoV	Severe Acute Respiratory Syndrome Coronavirus
SCCM	Society of Critical Care Medicine
SDWA	Safe Drinking Water Act
SHEA	Society for Healthcare Epidemiology of America
SHM	Society of Hospital Medicine
SIR	Standardized Infection Ratio
SIS	Surgical Infection Society
SME	Subject Matter Expert
SSI	Surgical Site Infection
SUTI	Symptomatic Urinary Tract Infection
TAP	Targeted Assessment for Prevention
TB	Tuberculosis
TJC	The Joint Commission
UK	United Kingdom
UN	United Nations
US	United States
UTI	Urinary Tract Infection
VA	(United States Department of) Veterans Affairs
VLBWI	Very Low Birth Weight Infant
VZIG	Varicella Zoster Immune Globulin
WHO	World Health Organization

Attachment 2: Liaison Representative / *ex officio* Member Reports

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

Meeting Date: November 15-16, 2018

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 (ACOEM)**

Interim activities and updates:

- ACOEM has issued additional guidance documents since the last meeting of HICPAC. In addition, public commentary has been made on a number of issues. ACOEM members are currently collaborating on a companion document to be published in JOEM at the time new CDC guidance applicable to tuberculosis surveillance among healthcare workers is released. The ACOEM national meeting was held in New Orleans April 27-May 2. Sessions with bearing upon medical center occupational health (MCOH) included a daylong course surveying MCOH basics and new developments, and half-day offerings addressing bloodborne exposure, workplace assaults, influenza, legionella, obesity interventions, travel medicine, office orthopedics, low back pain interventions, psychological safety in the workplace, informatics, electronic health records, workers' compensation claims management, NIOSH worksite investigations, physician burnout, and safe handling of hazardous drugs.

Guidelines and Guidance:

- Occupational Noise-Induced Hearing Loss 9/28/2018
- The Role of the Professional Supervisor in the Audiometric Testing Component of Hearing Conservation Programs 9/27/2018
- Fitness-for-Duty Assessments of Industrial Firefighters: Guidance for Occupational Medicine Physicians 2/10/2018
- Responsibilities of the Occupational and Environmental Medicine Provider in the Treatment and Prevention of Climate Change-Related Health Problems 2/8/2018
- Obesity in the Workplace: Impact, Outcomes, and Recommendations 1/30/2018
- Guidance for Occupational Health Services in Medical Centers 4/19/2017
- Global Trends in Occupational Medicine 3/15/2017

Position Statements:

- Utilization Review in Worker's Compensation 10/31/2017
- 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 Responds to OSHA Proposed Rulemaking on Tracking Workplace Injuries/Illnesses 10/2/2018
- ACOEM Responds to Proposed Changes to 2019 Medicare Physician Fee Schedule 9/21/2018

- ACOEM Expresses Concerns to EPA Regarding Agency's Proposed Rule on Strengthening Transparency in Regulatory Science 7/12/2018 ACOEM Comments to FDA on Opioid Prescribing Activity 3/21/2018
- ACOEM Applauds Proposed Legislation to Combat Opioid Epidemic 12/5/2017
- ACOEM Issues Commitment Statement on NAM Action Collaborative on Clinician Resilience and Well-being 12/5/2017
- ACOEM Urges DOT to Rescind Portion of Its Final Rule (49CFR Part 40) on Drug-Testing Procedures 12/1/2017
- 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 noted)

Press activities:

- High Rate of Drug/Alcohol-Related Deaths in WTC Survivors 10/22/2018
- Computer Prompts to Take Breaks from Sitting Lead to Lower Blood Pressure 9/20/2018
- Time for Employers to Consider Social Determinants of Health 8/24/2018
- Wisconsin Physician New President of Occupational Medical Society 7/22/2018
- Defining Worker Well-Being – Experts Propose New Framework 7/20/2018
- Higher 'Culture of Health' Scores Linked to Lower Health Care Cost Trends 6/28/2018
- 'Productive Aging' Is Key to Addressing the Aging Workforce 5/31/2018
- 'Call to Action' on Mental Health and Well-Being in the Workplace 4/12/2018
- Concussions Are Common in Theater Workers 3/15/2018
- Nurses in Worse Health Make More Medical Errors 2/22/2018
- Managing Obesity in the Workplace – New Guidance from ACOEM 1/8/2018
- Influenza Leads to Increased Missed Work Time 12/7/2017
- New Compendium Highlights Development of Clinical Decision Support to Enhance Worker Health 11/17/2017
- '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

Publications:

- As above

Other items of note:

Forthcoming guidance for management of tuberculosis surveillance in medical centers was discussed at the meeting of ACOEM's Medical Center Occupational Health Section, and in subsequent conference calls. Discussions between ACOEM members and authors of the forthcoming guidance document addressing TB surveillance among healthcare workers resulted in the formation of a writing group to generate a paper for JOEM publication to accompany the forthcoming CDC guidance, expected for publication in MMWR during the spring of 2019. Several ACOEM members are currently drafting sections in collaboration with the NTCA for the accompanying article.

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

Meeting Date: November 15-16, 2018

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

Liaison Representative name: Christopher Lombardozzi, MD

Organization represented: **America's Essential Hospitals (AEH)**

Interim activities and updates:

Guidelines and Guidance:

Position Statements:

Legislation:

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.
- **Antimicrobial Resistance (AMR) Challenge**—several members of America's Essential Hospitals have committed to this yearlong global initiative to reduce antibiotic and antimicrobial resistance. For example, essential hospitals identified as CDC Prevention Epicenters will be evaluating a machine learning model that can provide surgeons real-time decision support to prevent infections.

Press activities:

- **International Infection Prevention Week** (Oct. 14-20) – 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 the need for efforts across the progression of care to prevent infections.
- Pushed information to members about **CDC observation tools** to help infection preventionists and other health care providers reduce healthcare-associated infections (HAIs). We look forward to sharing with our members future tool suites tailored to different care settings.
- America's Essential Hospitals actively promotes CDC information to our members via social media on timely topics such as the release of the annual progress report on HAIs at acute-care hospitals, found in the Antibiotic Resistance Patient Safety Atlas. For this information and more, you can follow us on Twitter at @OurHospitals and on [Facebook](https://www.facebook.com/essentialhospitals) (www.facebook.com/essentialhospitals).
- We thank the CDC for its discussion by Vulnerable Populations Officer, Dr. Amy Wolkin, about the challenges of ensuring care for vulnerable populations during and after a disaster. Our essential hospital members are often among the first responders, and care for a patient population with high vulnerabilities to disease that can be exacerbated during and after an event. It is critical to consider health equity during emergency preparedness.

Publications:

- **Immigration** – America's Essential Hospitals maintains an [Immigration resource page](https://essentialhospitals.org/immigration-health-care-resources-essential-hospitals/) (<https://essentialhospitals.org/immigration-health-care-resources-essential-hospitals/>) to inform member and other stakeholder about timely issues. Most recently, a proposal from the Department of Homeland Security (October 2018) seeks to expand the types of public benefits immigration officials consider when determining whether an individual is

likely to become a “public charge” to include Medicaid and other health-related benefits, which may jeopardize the health of millions of legal residents nationally by creating a strong disincentive to seek care. There are public health concerns as well if people forgo medical visits and vaccinations or medications and remain in the community.

- **Population Health** – Essential hospitals around the country are targeting population health in their communities. The Essential Hospital’s Institute has a [website \(www.essentialcommunities.org\)](http://www.essentialcommunities.org) to highlight the work of our members and provide resources on public health partnerships, care coordination approaches, and data integration strategies to guide public health efforts.
- **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.

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

Meeting Date: November 15-16, 2018

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 (AHRQ)**

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 three major domains:

1. Promoting antibiotic stewardship (AS);
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 participated in the Best Practices and Implementation subgroups of the Presidential Advisory Committee on Combating Antibiotic-Resistant Bacteria (PACCARB) Infection Prevention and Stewardship working group which presented its findings to PACCARB in September 2018.

- *AHRQ Safety Program for Improving Antibiotic Use*

The acute care cohort of the AHRQ Safety Program for Improving Antibiotic Use is coming to a close this month, with 400 hospitals participating, including 80 critical access hospitals and 6 DoD facilities. An educational toolkit focused on this setting will be released, planned for summer 2019. A one-year long-term care cohort is scheduled to launch in December 2018, with an ambulatory cohort planned to begin in December 2019. 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 250-500 acute care hospitals, 250-500 long-term care facilities, and 250-500 ambulatory care settings (i.e., clinics, physician's offices, and urgent care centers). This is a collaborative effort that is consistent with CDC Core Elements of Antibiotic Stewardship and involves coordination with CDC and CMS. The project promises to have a significant impact through the overall increase in AS activities it will produce.

- *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. Colorectal surgery is the focus in the first cohort of hospitals which began participation in mid-2017. Orthopedic surgery has been added in the second cohort. More than 250 hospitals are currently participating. Recruitment is underway for the third cohort which will expand to gynecologic surgery.

- *AHRQ Safety Program for Intensive Care Units (ICUs): 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 ICUs 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 such ICUs continue to be developed, including a modified set of CUSP training resources. Over 500 ICUs have been recruited to participate nationwide. Two additional one-year cohorts are planned, one beginning in January 2019 and a second in early 2020.

Guidelines and Guidance:

- Toolkit to Improve Antibiotic Use in Acute Care Hospitals—planned for Summer 2019

Publications:

- Selected AHRQ-funded Publications:
 - Akinboyo, I. C., A. Voskertchian, G. Gofu, et al. (2018). "Epidemiology and risk factors for recurrent *Staphylococcus aureus* colonization following active surveillance and decolonization in the NICU." *Infect Control Hosp Epidemiol* **39**(11): 1334-1339.
 - Bardossy, A. C., T. Williams, K. Jones, S. Szpunar, et al. (2018). "Culturing practices and the care of the urinary catheter in reducing NHSN-defined catheter-associated urinary tract infections: The tale of two teaching hospitals." *Infect Control Hosp Epidemiol*: 1-3.
 - Bradley, S. M., S. J. Schweon, L. Mody, et al. (2018). "Identifying safe practices for use of the urinary leg bag drainage system in the postacute and long-term care setting: An integrative review." *Am J Infect Control* **46**(9): 973-979.
 - D'Agata, E. M. C., C. C. Lindberg, C. M. Lindberg, et al. (2018). "The positive effects of an antimicrobial stewardship program targeting outpatient hemodialysis facilities." *Infect Control Hosp Epidemiol*: 1-6.
 - D'Agata, E. M. C., D. Tran, J. Bautista, D. Shemin and D. Grima (2018). "Clinical and Economic Benefits of Antimicrobial Stewardship Programs in Hemodialysis Facilities: A Decision Analytic Model." *Clin J Am Soc Nephrol* **13**(9): 1389-1397.
 - Durkin, M. J., M. Keller, A. M. Butler, et al. (2018). "An Assessment of Inappropriate Antibiotic Use and Guideline Adherence for Uncomplicated Urinary Tract Infections." *Open Forum Infect Dis* **5**(9): ofy198.
 - Govindan, S., A. Snyder, S. A. Flanders, et al. (2018). "Peripherally Inserted Central Catheters in the ICU: A Retrospective Study of Adult Medical Patients in 52 Hospitals." *Crit Care Med*.
 - Hsu, H. E., A. T. Kawai, R. Wang, et al. (2018). "The Impact of the Medicaid Healthcare-Associated Condition Program on Mediastinitis Following Coronary Artery Bypass Graft." *Infect Control Hosp Epidemiol* **39**(6): 694-700.
 - Keller, S. C., P. D. Tamma, S. E. Cosgrove, et al. (2018). "Ambulatory Antibiotic Stewardship through a Human Factors Engineering Approach: A Systematic Review." *J Am Board Fam Med* **31**(3): 417-430.
 - Khamash, D. F., A. Voskertchian, P. D. Tamma, et al. (2018). "Increasing Clindamycin and Trimethoprim-Sulfamethoxazole Resistance in Pediatric *Staphylococcus aureus* Infections." *J Pediatric Infect Dis Soc*.
 - Lee, Y. S. H., P. W. Stone, M. Pogorzelska-Maziarz, et al. (2018). "Differences in work environment for staff as an explanation for variation in central line bundle compliance in intensive care units." *Health Care Manage Rev* **43**(2): 138-147.
 - Lin, D. M., K. A. Carson, L. H. Lubomski, et al. (2018). "Statewide Collaborative to Reduce Surgical Site Infections: Results of the Hawaii Surgical Unit-Based Safety Program." *J Am Coll Surg* **227**(2): 189-197.e181.
 - Meddings, J., T. A. Skolarus, K. E. Fowler, et al. (2018). "Michigan Appropriate Perioperative (MAP) criteria for urinary catheter use in common general and orthopaedic surgeries: results obtained using the RAND/UCLA Appropriateness Method." *BMJ Qual Saf*.

- Olsen, M. A., D. Stwalley, C. Demont, et al. (2018). "Increasing Age Has Limited Impact on Risk of Clostridium difficile Infection in an Elderly Population." *Open Forum Infect Dis* **5**(7): ofy160.
- Pulia, M., M. Kern, R. J. Schwei, et al. (2018). "Comparing appropriateness of antibiotics for nursing home residents by setting of prescription initiation: a cross-sectional analysis." *Antimicrobial Resistance & Infection Control* **7**(1): 74.
- Pulia, M., R. Redwood and L. May (2018). "Antimicrobial Stewardship in the Emergency Department." *Emerg Med Clin North Am* **36**(4): 853-872.
- Ray-Barruel, G., M. Cooke, M. Mitchell, et al. (2018). "Implementing the I-DECIDED clinical decision-making tool for peripheral intravenous catheter assessment and safe removal: protocol for an interrupted time-series study." *BMJ Open* **8**(6): e021290.
- Rhee, C., R. Wang, M. S. Jentzsch, et al. (2018). "Impact of the 2012 Medicaid Health Care-Acquired Conditions Policy on Catheter-Associated Urinary Tract Infection and Vascular Catheter-Associated Infection Billing Rates." *Open Forum Infect Dis* **5**(9): ofy204.
- Russell, D., D. W. Dowding, M. V. McDonald, et al. (2018). "Factors for compliance with infection control practices in home healthcare: findings from a survey of nurses' knowledge and attitudes toward infection control." *Am J Infect Control*.

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

Meeting Date: November 15-16, 2018

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

Liaison Representative name: Holly Carpenter

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

Interim activities and updates:

- Completion of CDC Contract #200-2016-89681, *Enhancing Education and Training in Infection Prevention and Control for US Nurses*. Below is an excerpt from the final report:

Overall, the *Enhancing Education and Training in Infection Prevention and Control for U.S. Nurses* contract was successful in its mission to empower nurses to protect themselves and their patients by providing real, time tailored infection prevention and control education to U.S. nurses. Throughout the contract period thousands of nurses and other healthcare professionals engaged in discussions about the relationship between basic IPC protocols, patient safety and preparedness for the next emerging infectious disease threat. The NICE Network achieved nearly all three of its short-term goals identified in the Logic Model:

- (1) Disseminate infection prevention and control resources to 15% of the nation's 3.6 million registered nurses.-MET, Had 2.8 million social media likes, retweets, reaches and engagements
 - (2) 15,000 registered nurses attend NICE Network webinars throughout the contract period.- Nearly Met, Reached 12,000 nurses and other healthcare professional
 - (3) 35% of NICE Network training session attendees report the intent to change in practice as a result of participation in the training session.-EXCEEDED, 68.8% of NICE Network training session attendees said they were committed or highly committed to changing their practice
- Submission to HICPAC for 2 ANA nurse liaison representatives

Guidelines and Guidance:

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

- No activity to update but see ANA & CDC White Paper from 2017, *Redefining the Antibiotic Stewardship Team: Recommendations from the American Nurses Association/Centers for Disease Control and Prevention Workgroup on the Role of Registered Nurses in Hospital Antibiotic Stewardship Practices*: (<https://www.cdc.gov/antibiotic-use/healthcare/pdfs/ANA-CDC-whitepaper.pdf>) and also from 2017: Infection Prevention and Control [Infographic](https://www.nursingworld.org/~4af4cd/globalassets/practiceandpolicy/work-environment/health--safety/infectionpreventioncontrol-infographic.pdf) along with ENA and NICE Network: (<https://www.nursingworld.org/~4af4cd/globalassets/practiceandpolicy/work-environment/health--safety/infectionpreventioncontrol-infographic.pdf>).

Position Statements:

- No activity to update

Legislation:

- No activity to update

Campaigns and related activities:

- Awareness, education, quarterly calls, and resources through the Nursing Infection Control Education (NI) Network

- Supported International Infection Prevention Week via Healthy Nurse, Healthy Nation and ANA social media and e-newsletters
- Liaison with PEW Trust Antibiotic Resistance Project

Press activities:

- No activity to update

Publications:

- McCammon, S. & Morgan, S. (July, 2018). NICE Network: Nurses leading change in infection prevention. *American Nurse Today*, 13(7), 29.

Other items of note:

- Webinar: Empowering Nurses to Protect Themselves and Their Patients: Best Practices in Injection Safety-February 22, 2018
- Webinar: Disaster Preparedness through the Seasons-March 16, 2018
- Webinar: Nurses' Role in Antibiotic Stewardship-February 2, 2018
- Webinar: A Discussion of Current Infection Prevention and Control Challenges in Maternal and Child Health Settings-May 15, 2018

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

Meeting Date: November 15-16, 2018

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:

- Revising AORN Evidence Model to align with the CDC Infection Prevention and Control Recommendation Categorization Scheme. The new model will be used in the revised Guideline for Surgical Attire, which will be available for public comment January 2-February 22, 2019.
- ECRI Guidelines Trust has accepted 15 AORN guidelines for inclusion that were previously accepted by the National Guideline Clearinghouse (NGC):
 - Preoperative patient skin antisepsis (2014)
 - Autologous tissue management (2014)
 - Surgical attire (2014)
 - Care of the patient receiving local anesthesia (2014)
 - Radiation safety (June 2015)
 - Prevention of unplanned patient hypothermia (November 2015)
 - Prevention of retained surgical items (January 2016)
 - Care of the patient receiving moderate sedation/analgesia (December 2015)
 - Processing flexible endoscopes (February 2016)
 - Safe use of energy-generating devices (September 2016)
 - Patient information management (July 2016)
 - Hand hygiene (September 2016)
 - Surgical smoke safety (December 2016)
 - Minimally invasive surgery (December 2016)
 - Positioning the patient (May 2017)

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 \(www.aorn.org\)](http://www.aorn.org)
- The 2019 *Guidelines for Perioperative Practice* will include 6 new evidence-rated guidelines: Safe Patient Handling and Management, Design and Maintenance of the Surgical Suite, Sterilization, Safe Environment of Care, Sterile Technique, and Transmission-Based Precautions.
- Guidelines in development for 2020 print publication
 - Surgical Attire: public comment January 2- February 22, 2019
 - Hypothermia: public comment January 7- February 7, 2019
 - Packaging Systems for Sterilization: public comment May 10- June 9, 2019
 - Sharps Safety: public comment June 3- July 3, 2019
 - Autologous Tissue Management: public comment July 3- August 3, 2019
 - Environmental Cleaning: public comment July 31- August 31, 2019

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)
- Revised August 2018: RN First Assistants

- In development: Nurse Residency Programs
- Under revision:
 - Standards of Perioperative Nursing
 - One Perioperative Registered Nurse Circulator Dedicated to Every Patient Undergoing a Surgical or Other Invasive Procedure
 - Advanced Practice Registered Nurse in the Perioperative Environment

Legislation:

- AORN legislative priorities for 2019 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
- Surgical Smoke Safety. [Go Clear Award](http://www.aorn.org/aorn-org/education/facility-solutions/aorn-awards/aorn-go-clear-award) recognizes health care facilities committed to a surgical smoke-free environment for their perioperative team and patients:
(<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](https://www.aorn.org/Aorn-org/About-AORN/AORN-Newsroom/Press-Releases)
(<https://www.aorn.org/Aorn-org/About-AORN/AORN-Newsroom/Press-Releases>)

Publications:

- 2018 *Guidelines for Perioperative Practice*, AORN Journal, Perioperative Job Descriptions and Competency Evaluation, Perioperative Policies and Procedures, & Ambulatory Surgery Center Resources

Other items of note:

- AORN Global Surgical Conference & Expo 2019, April 6-10, Nashville, TN

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

Meeting Date: November 15-16, 2018

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

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

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

Interim activities and updates:

- APIC is conducting a Consensus Conference in November 2018 to bring together key stakeholders to consider the future role of the infection preventionist
- APIC to pilot podcasts in 2019-showcasing topics related to infection prevention and control and highlighting work of members

Guidelines and Guidance:

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

- To help health facilities quickly spot infection prevention gaps and take action in real time, APIC and the CDC have released free, downloadable Quick Observation Tools (QUOTs).

The QUOTs are a set of ready-to-use assessment forms arranged around common themes, environments, and patient populations. The tools are designed to allow healthcare workers to check infection prevention at the patient-care level in a matter of minutes. The 20 sets of QUOTs are based on scientific recommendations, and each contains as many as 10 individual observation worksheets for use separately or together. <http://ipcobservationtools.site.apic.org/>

- Through funding provided by the CDC for the States Targeting Reduction in Infections via Engagement (STRIVE) program, four modules were developed to support infection prevention and control training for environmental services personnel by APIC subject matter experts and reviewed by subject matter experts from the Association for the Health Care Environment (AHE).

APIC was a member of the STRIVE National Program Team and provided subject matter expertise to participating hospitals through resource development, presentations on national webinars, and direct interaction with facilities through in-person presentations and site visits, coordinated by the American Hospital Association's Health Research & Educational Trust (HRET). The Environmental Services Training Modules and Tools are one of several STRIVE resources APIC created or helped to create. Read more about the STRIVE program at: APIC Infection Preventionist: States Targeting Reduction in Infections via Engagement. These will become available on the APIC website toward the end of 2018.

Position Statements:

- N/A

Legislation:

- Pursued state legislation in New York state requiring infection preventionists be certified to practice in a hospital setting. This effort promotes patient safety, which multiple studies have shown that infection prevention programs led by certified IPs contribute to better patient outcomes and provides IPs with a uniform expectation to practice in a hospital.
- Advocated for Senators to cosponsor S. 2469, Strategies to Address Antibiotic Resistance Act (STAAR Act). During APIC's annual fall lobby day members advocated for Senators to cosponsor this legislation, which focuses around the federal response to antibiotic resistance.

- Worked with coalition partners for Congress to provide proper funding for federal infection prevention programs.
- Opposed efforts to cut the Prevention and Public Health Fund, as this funding is crucial to the CDC's infection prevention and control programs.
- Submitted [comments to CMS on the proposed FY 2019 updates to the Hospital Inpatient Prospective Payment System and Long-Term Care Payment System](https://apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/FY2019_IPPS-LTCH_comments_APICfinal_6-25-18.pdf) (https://apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/FY2019_IPPS-LTCH_comments_APICfinal_6-25-18.pdf)
- Submitted [comments to CMS on proposed FY 2019 updates to the Hospital Inpatient Psychiatric Facility Prospective Payment System](https://apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/FY2019_Inpnt_Psych_PPS_comments_APICfinal_6-25-18.pdf) (https://apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/FY2019_Inpnt_Psych_PPS_comments_APICfinal_6-25-18.pdf).
- Submitted [comments to CMS on proposed FY 2019 updates to the Inpatient Rehabilitation Facility Prospective Payment System](https://apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/FY2019_IRF_PPS_comments_APICfinal_6-25-18.pdf) (https://apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/FY2019_IRF_PPS_comments_APICfinal_6-25-18.pdf).
- Submitted [comments to CMS on proposed CY 2019 updates to the Home Health Prospective Payment System](http://www.apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/CY2019_Home_Health_PPS_comments_final_8-30-18.pdf) (http://www.apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/CY2019_Home_Health_PPS_comments_final_8-30-18.pdf).
- Submitted [comments to CMS on proposed CY 2019 updates to the End-Stage Renal Disease Prospective Payment System](http://www.apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/CY2019_ESRD_PPS_comments_APICfinal_9_6_18.pdf) (http://www.apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/CY2019_ESRD_PPS_comments_APICfinal_9_6_18.pdf).
- Submitted [comments to CMS on proposed CY 2019 updates to the Hospital Outpatient Prospective Payment System and Ambulatory Surgical Center Payment System](http://www.apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/CY2019_OPPS_comments_APICfinal_2-24-18.pdf) (http://www.apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/CY2019_OPPS_comments_APICfinal_2-24-18.pdf).
- Submitted [comments to CMS on proposed CY 2019 revisions to payment policies under the Physician Fee Schedule](http://www.apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/Physician_Fee_Schedule_CY2019_comments_APICfinal_9_6_18.pdf) (http://www.apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/Physician_Fee_Schedule_CY2019_comments_APICfinal_9_6_18.pdf).
- Sent [joint APIC/SHEA letter to CMS](https://apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/APIC-SHEA_re_2016_Inpatient_CoP_Proposed_Rule_FINAL.pdf) (https://apic.org/Resource_/TinyMceFileManager/Advocacy-PDFs/APIC-SHEA_re_2016_Inpatient_CoP_Proposed_Rule_FINAL.pdf) requesting that the agency finalize the 2016 proposed revisions to the hospital and critical access hospital Conditions of Participation.

Campaigns and related activities:

- Celebrated International Infection Prevention Week, October 14-20. Activities focused on the issue of protecting patients everywhere. Highlights:
 - APIC created two new infographics for healthcare professionals: [Top 10 Ways to Protect Your Patients](http://professionals.site.apic.org/files/2018/08/APIC_ProtectYourPatients_Infographic.pdf) (http://professionals.site.apic.org/files/2018/08/APIC_ProtectYourPatients_Infographic.pdf) and [Top 10 Ways to Protect Your Residents](http://professionals.site.apic.org/files/2018/10/APIC_ProtectYour_RESIDENTS_Infographic.pdf) (http://professionals.site.apic.org/files/2018/10/APIC_ProtectYour_RESIDENTS_Infographic.pdf).
 - Two promotional toolkits were created to allow members and partner groups to spread infection prevention messages through their communications channels.

- Twitter chat with more than 50 participants to discuss how healthcare providers, patients, and others can prevent infections throughout the continuum of care. International Infection Prevention Week 2018 generated a good deal of social conversation with 5,058 mentions.

Press activities:

- APIC CEO Katrina Crist and SHEA CEO Eve Humphreys, MBA, CAE, jointly authored a series of Op-Eds to raise awareness of the need for institutional support from hospital leadership for infection prevention and control and antimicrobial stewardship programs. Katrina Crist's article, "[Commentary: C-suites should see antibiotic stewardship and infection control as one issue,](http://www.modernhealthcare.com/article/20180615/NEWS/180619925)" (<http://www.modernhealthcare.com/article/20180615/NEWS/180619925>) published June 15 in *Modern Healthcare*. Eve Humphreys's article, "[Is your hospital ready for the next outbreak, epidemic, or even another bad flu season?](https://www.beckershospitalreview.com/quality/is-your-hospital-ready-for-the-next-outbreak-epidemic-or-even-another-bad-flu-season?)" (<https://www.beckershospitalreview.com/quality/is-your-hospital-ready-for-the-next-outbreak-epidemic-or-even-another-bad-flu-season.html>) ran in Becker's *Clinical Leadership & Infection Control* in May.
- Issued [press release](https://apic.org/For-Media/News-Releases/Article?id=e90b8537-db08-4ebe-8486-5d816c969678) (<https://apic.org/For-Media/News-Releases/Article?id=e90b8537-db08-4ebe-8486-5d816c969678>) to announce APIC and CDC's new Quick Observation Tools (QUOTs) to help prevent HAIs.
- In connection with APIC's Annual Conference, issued [press releases](https://apic.org/For-Media/News-Releases/Article?id=8af1bf12-2ddf-4efc-acf1-48aa1de9ffb6) (<https://apic.org/For-Media/News-Releases/Article?id=8af1bf12-2ddf-4efc-acf1-48aa1de9ffb6>) to promote APIC awards, as well as scientific abstracts focusing on:
 - Skin-to-skin care and spike in *Staphylococcus aureus* infection in newborns
 - Risk factors associated with C-section infections
 - Effective infection control strategies for measles and mumps outbreaks
 - Importance of including markers and erasers on environmental cleaning checklists
 - Importance of including nurses on antimicrobial stewardship teams
 - IPC gaps in critical access hospitals
- Issued press releases on AJIC studies focusing on:
 - Infection prevention staffing needs
 - The impact of HAIs on patients
 - Hospital privacy curtains as potential vector of pathogen transmission
 - High-risk staph transmission in the OR

Publications:

- Recently published *Ready Reference for Microbes, 4th edition*. This updated book includes critical new coverage on the Zika virus, *Candida auris*, and other emerging pathogens, along with updated appendices on MRSA, *C. diff*, seasonal influenza, and more.
- APIC Text Online has updated chapters on Cleaning, Disinfection, and Sterilization; *Clostridium difficile* Infection; and Surgical Site infection.
- *Prevention Strategist* summer issue included articles on disaster and emergency preparedness, certification, and relative risks and odds ratios (cover stories); Infection prevention and emergency preparedness during the 2017 northern California wildfires; Weathering hurricanes; measles in an acute care hospital; scabies outbreak; facility flood during the holidays; *Elizabethkingia anophelis* outbreak; bioterrorism; hepatitis A; brucellosis; and adenovirus.
- *Prevention Strategist* fall issue included articles on implementation science, features from Annual Conference, surgical site infections, and hand hygiene (cover stories);

Making the pitch to c-suite; partnerships with IPs and the emergency department; IPs in the purchasing process; social media; IIPW; CRE; interpreting uncertainty; and head lice.

- Published [Consumer Alerts \(https://apic.org/For-Consumers/Monthly-alerts-for-consumers\)](https://apic.org/For-Consumers/Monthly-alerts-for-consumers) on preventing infections during a natural disaster, “nightmare” bacteria, preventing vector-borne diseases, preventing foodborne illnesses like *Salmonella*, Legionnaires’ Disease, importance of vaccination, and conjunctivitis.

Other items of note:

- Released a recruitment [video \(https://www.youtube.com/watch?v=5rPk9XhA700\)](https://www.youtube.com/watch?v=5rPk9XhA700) about the role of the IP that can be used by anyone to introduce various audiences -- including students, interns, staff, administrators, constituents, lawmakers, etc. – to the role of the IP. “[Infection Preventionists save lives](https://www.youtube.com/watch?v=5rPk9XhA700)” is housed on APIC’s YouTube channel (<https://www.youtube.com/watch?v=5rPk9XhA700>).

Liaison Representative Report

HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)

Centers for Disease Control and Prevention

Meeting Date: November 15-16, 2018

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

Liaison Representative name: Kristen (Kris) Ehresmann

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

Interim activities and updates:

- ASTHO continues to enhance the capacity and performance of state and territorial health officials and other state public health leaders to effectively monitor and address the growing threat of healthcare-associated infections (HAIs) and emerging antibiotic-resistant (AR) infections, through building strong partnerships and promoting HAI/AR prevention and control standards and policies. Key areas of ASTHO's HAI work include:
 - Co-leading the Council for Outbreak Response: Healthcare-Associated Infection and Antimicrobial-Resistant Pathogens, (CORHA), with the Council of State and Territorial Epidemiologists (CSTE). CORHA works to develop and promote resources and tools to support HAI outbreak response activities across the public health-healthcare continuum. [The CORHA website \(http://corha.org/\)](http://corha.org/) features a "Resource Hub" that includes CORHA-developed products and external resources.
 - Promoting and disseminating HAI/AR tools, resources, and guidance to educate state and territorial health officials, other state public health leaders, and state health agency staff on HAI/AR, including containment, prevention and control best practices, and priorities from the CDC and other state-level partners.
 - Forthcoming training and learning opportunities for state and territorial health officials, other state public health leaders, and HAI/AR program directors on effectively communicating the importance and successes of HAI/AR programs.
 - Forthcoming report on state HAI outbreak reporting policies on how the existence, content, language, and structure of HAI outbreak reporting policies influence HAI outbreak reporting to public health to inform public health action.
 - Participating in CDC's AMR challenge in collaboration with affiliate partners.

Guidelines and Guidance:

- ASTHO's [Healthcare and Infection Control Gateway \(http://www.astho.org/healthcare-and-infection-control/\)](http://www.astho.org/healthcare-and-infection-control/) provides 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/#)

Other items of note:

- ASTHO's podcast episode on "[Policy Approaches to Containing Antimicrobial Resistance](http://www.astho.org/podcasts/?utm_source=Informz&utm_medium=email&utm_campaign=change%20this%20(per%20campaign))" ([http://www.astho.org/podcasts/?utm_source=Informz&utm_medium=email&utm_campaign=change%20this%20\(per%20campaign\)](http://www.astho.org/podcasts/?utm_source=Informz&utm_medium=email&utm_campaign=change%20this%20(per%20campaign))) highlights national and state perspectives on the prevention and containment of unusually resistant bacteria.

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

Meeting Date: November 15-16, 2018

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** was held June 10-14 in West Palm Beach, Florida
- The **2019 CSTE [annual conference](https://www.csteconference.org/2019/)** will be held June 2-6 in Raleigh, North Carolina.
- **Position statement process has undergone a significant overhaul, now also have briefs and letters.** Position statements allow CSTE members to standardize surveillance case definitions, maintain the Nationally Notifiable Condition List, and address policy issues that could affect state or local law, rules or regulations.
 - *Note: All other policy issues, resolutions, etc. that would not require legal changes at the state or local level should be addressed via the process for [CSTE Briefs](https://cste.site-ym.com/page/BriefsLanding) (<https://cste.site-ym.com/page/BriefsLanding>)*
 - For more details on new process for position statements, briefs and letters see the CSTE [website](http://www.cste.org/page/PPSP) (<http://www.cste.org/page/PPSP>)

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 next meet in person in Nov. 2018. A one-pager describing the mission, vision, membership can be found on the CORHA [website](http://corha.org/) (<http://corha.org/>)
 - The Council is co-chaired by CSTE and ASTHO; CDC, NACHO, APIC, SHEA, APHL, CMS and FDA also are members of the Council. There are multiple workgroups including:
 - **CORHA Workgroup A (Outbreak Detection and Reporting):**
 - Create standard definitions for outbreaks and exposure events and thresholds for reporting;
 - Improve reporting of outbreaks and exposure events to public health;
 - Improve the use of existing surveillance systems to detect outbreaks.
 - **CORHA Workgroup B (Outbreak investigation and control)** will work on
 - Defining appropriate levels of response;
 - Improve response to investigation and control of outbreaks to public health;
 - Improve data management for outbreak investigation and tracking
 - **CORHA Laboratory Workgroup (draft charge)**
 - Contribute knowledge and support activities to optimize laboratory practices in support of identifying and investigating possible HAI/AR outbreaks.
 - Support effective interactions among laboratory partners and between laboratories, healthcare facilities, and state/local health departments in the context of HAI/AR response activities.
 - **CORHA Policy Workgroup (draft charge)**
 - 1) Improve policy and legal standards for reporting, investigation, notification and disclosure of HAI/AR outbreaks and exposure events
 - *Outbreak Reporting, Notification, and Disclosure.*
 - For the purposes of this workgroup, the following definitions are important:

- *Outbreak reporting* is defined as activities that occur when a facility reports a possible outbreak to a local and/or state health department(s).
 - *Notification* occurs when individuals, including patients potentially affected by an outbreak or otherwise have a right to know are informed of their risk.
 - *Disclosure* is defined as activities that occur to inform individuals beyond the patients potentially affected by an outbreak.
- 2) Explore options to enhance legal authority and policy options to support best practices
- **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 the Council of State and Territorial Epidemiologists (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, including 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).
 - The ARSTF has released its year 2 Report and Recommendations. It is available [online](https://cdn.ymaws.com/www.cste.org/resource/resmgr/arstf/ARSTF_Year_2_Report_and_Reco.pdf) (https://cdn.ymaws.com/www.cste.org/resource/resmgr/arstf/ARSTF_Year_2_Report_and_Reco.pdf)
 - Other key documents are:
 - [Vision](https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/ARS_Vision.pdf) (https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/ARS_Vision.pdf)
 - [Strategic Plan](https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/ARS_Strategic_Map.pdf) (https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/ARS_Strategic_Map.pdf)
 - [Strategic Profile](https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/Strategic_Profile_for_Nation.pdf) (https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/Strategic_Profile_for_Nation.pdf)
 - Roles and Responsibilities [Table](https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/ARS_Roles_and_Responsibilities.pdf) (https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/ARS_Roles_and_Responsibilities.pdf)
 - 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 Brooke Beaulieu at brooke@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. It is currently undergoing clearance at CSTE and is expected to be published shortly.
- **Data analysis and Presentation Standards (DAPS) toolkit**

- Work is 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)

Position Statements (passed at 2018 annual meeting):

- **18-ID-05** – [Standardized Case Definition](#) for *Candida auris* clinical and colonization/screening cases and National Notification of *C. auris* case, clinical (https://cdn.ymaws.com/www.cste.org/resource/resmgr/2018_position_statements/18-ID-05.pdf)
- **Other Position statements passed at 2018 annual meeting and available [online](https://www.cste.org/page/PositionStatements)** (<https://www.cste.org/page/PositionStatements>)
 - **18-EH-01** – Standardized Surveillance for Carbon Monoxide Poisoning
 - **18-ID-01** – Standardized Case Definition for Surveillance of RSV-Associated Mortality
 - **18-ID-02** – Case Definition for Non-pestis Yersiniosis
 - **18-ID-03** – Revision to the Case Definition for National Diphtheria Surveillance
 - **18-ID-04** – Update to Yellow Fever Case Definition
 - **18-ID-06** – Revisions to the Surveillance Case Definition, Case Classification, Public Health Reporting, and National Notification for Listeriosis
 - **18-ID-07** – Public Health Reporting and National Notification for Hepatitis A
 - **18-ID-08** – Public Health Reporting and National Notification for *Salmonella enterica* serotype Typhi (S. Typhi) and *Salmonella enterica* serotypes Paratyphi A, B, and C (S. Paratyphi) Infections

Other items of note:

- CSTE Webinar library is located [online](http://www.cste.org/?page=WebinarLibrary) (<http://www.cste.org/?page=WebinarLibrary>)
 - Includes webinar series on topics such as writing for the MMWR, epi methods (syndromic surveillance, CASPER), informatics and workforce development
- CSTE HAI subcommittee members are compiling comments on:
 - [USP 797](https://www.usp.org/compounding/797-download)—(<https://www.usp.org/compounding/797-download>)
 - FDA's [Guidance](#) for Industry addressing Insanitary Conditions at Compounding Facilities (<https://www.fda.gov/downloads/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/UCM514666.pdf>)
- CSTE was represented at the GAO/NAS Antimicrobial Resistance meeting in Washington DC Sept 17-18, 2018.

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

Meeting Date: November 15-16, 2018

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

Ex officio member name: Yvonne Chow

Agency represented: **Health Resources & Services Administration (HRSA) / Federal Office of Rural Health Policy (FORHP)**

Campaigns and related activities:

- National Rural Health Day – November 15, 2018
 - **Tuesday, November 13**
 - [Five Ways Pharmacists can be Antibiotics Aware](https://cc.readytalk.com/registration/#/?meeting=9y0qq47i2hng&campaign=o5twqp140mq5)
(<https://cc.readytalk.com/registration/#/?meeting=9y0qq47i2hng&campaign=o5twqp140mq5>)
 - *Webinar from 1–2pm ET*
 - This educational activity from the Centers for Disease Control and Prevention is designed to review updated information on common antibiotic use problems encountered by general clinical pharmacists. Discussion of case-based scenarios will be used to demonstrate how to identify and prioritize antibiotic-related problems and explain examples of employing effective stewardship strategies in the acute care setting. The presenters will use a variety of active techniques to communicate information and facilitate discussion of the clinical scenarios. The webinar will be receiving pharmacy continuing education credits but other healthcare professionals such as MDs and nurses are welcome to participate.
 - **Thursday, November 15**
 - [CMS Hospital Improvement Innovation Network \(HIIN\) Efforts in Rural Health](https://secure.confertel.net/tsRegisterD.asp?course=68601077&mcode=HRSA)
(<https://secure.confertel.net/tsRegisterD.asp?course=68601077&mcode=HRSA>)
 - *Webinar from 1–2pm ET*
 - The Centers for Medicare & Medicaid Services will host a webinar to highlight examples of Hospital Improvement Innovation Network (HIIN) projects that address access to care and harm reduction in critical access and rural hospitals.

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

Meeting Date: November 15-16, 2018

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

Liaison Representative name: Stephen Weber, MD, ScM

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

Interim activities and updates:

- **IDSA, together with partner organizations, successfully convened IDWeek 2018 in San Francisco, CA.** Held from October 3-7, IDWeek 2018 again embraced the theme: “Advancing Science, Improving Care” for thousands of attendees, presenters and exhibitors.
- **IDSA notes Antibiotic-focused Pharmaceutical Company Cuts Highlight Vulnerability of Drug Development Pipeline.** News of continued cutbacks at one of what is already a limited number of companies conducting antibiotic research and development threatens access to a critical medicine and further validates a critical need for government-led incentives that both reward and support work towards a robust, renewable antibiotic supply. The recent announcement from a biopharmaceutical company that discovers, develops and markets antibacterial drugs to address multi-drug resistant infections, of plans to reduce operating costs by up to 40 percent underscores the ramifications of a fragile antibiotic pipeline, and of factors leading to limited current investment in antibiotic research and development.
- **AMR Conference Puts Focus on Research, Stewardship, Innovation and Diagnostics.** Leading infectious disease experts highlighted issues critical to confronting, controlling and reversing the growing global public health threat of pathogens that are increasingly unresponsive to existing treatments, as the World Antimicrobial Resistance Congress opened in Washington, DC. Drawing more than 400 health providers, regulators, funders, researchers, investors and industry as well as health policy leaders, the conference will examine urgent needs, challenges and solutions for antibiotic research and development, antimicrobial stewardship, rapid diagnostic technologies, and collaborative partnerships.
- **25 Institutions Receive the IDSA Antimicrobial Stewardship Centers of Excellence Designation.** IDSA announced in August the recipients of its Antimicrobial Stewardship Centers of Excellence (CoE) designation. The program, launched in 2017, recognizes institutions that have created stewardship programs led by infectious diseases physicians and ID-trained pharmacists that are of the highest quality and have achieved standards established by the CDC.
- **IDSA Presents Priorities at World Health Assembly.** The Infectious Diseases Society of America participated in the 71st World Health Assembly in Geneva during the week of May 21-25, presenting and joining statements reflecting IDSA priorities.

Guidelines and Guidance:

- Miller JM, et al, A Guide to Utilization of the Microbiology Laboratory for Diagnosis of Infectious Diseases: 2018 Update by the Infectious Diseases Society of America and the American Society for Microbiology, *Clinical Infectious Diseases*, Volume 67, Issue 6, 31 August 2018, Pages e1–e94
- Link to other guidelines on [website: http://www.idsociety.org/IDSA_Practice_Guidelines/](http://www.idsociety.org/IDSA_Practice_Guidelines/)

Legislation & Policy:

- **IDSA Urges Strengthened U.S. Leadership of Global Health Security Agenda.** As Global Health Security Agenda partners met in Indonesia in early November to commit

to their next steps in improving epidemic readiness worldwide, IDSA asked the U.S. Department of Health and Human Services to strengthen its leadership of efforts through the partnership. In a letter to HHS Secretary Alex Azar, IDSA urged increased support of the Global Health Security Agenda to combat antimicrobial resistance, increase immunization access, build health care workforces, and enhance capacities for medical countermeasures and personnel deployment in response to outbreaks.

- **Transfer of Funding from Infectious Diseases Prevention, Care and Research Threatens Public Health Responses.** The administration's transfer of funds from infectious diseases prevention, care and biomedical research programs to offset the rising costs of the "Unaccompanied Alien Children" program comes as our nation prepares for flu season and confronts unprecedented increases in cases of sexually transmitted diseases, spikes in infections linked to the opioid crisis, and as an ongoing Ebola outbreak in the Democratic Republic of the Congo highlights needs for national and global public health system and research investments. IDSA and the HIV Medicine Association expressed concern that the funds, transferred before the end of the fiscal year, were taken from public health programs critical to maintaining the health of communities across the country and to supporting necessary research toward more effective responses to our nation's greatest public health challenges

Campaigns and related activities:

- The Infectious Diseases Society of America joined the United States Centers for Disease Control and Prevention in a yearlong challenge to promote and support investments, innovations, and strategies against the growing global threat of antimicrobial resistance. The [CDC AMR challenge](https://idsocietyorg.app.box.com/s/0ezdfvec74l4t2dftjmlbgbzdo49igno) (<https://idsocietyorg.app.box.com/s/0ezdfvec74l4t2dftjmlbgbzdo49igno>) recognizes AMR as one of the most urgent and dangerous public health issues confronting the world, threatening life expectancy as well as the gains of modern medicine. The initiative launched in September calls on leaders and communities across sectors to play parts and work together to combat AMR globally.

Publications:

- Philipp J, et al., Fatal Measles Virus Infection After Rituximab-Containing Chemotherapy in a Previously Vaccinated Patient, *Open Forum Infectious Diseases*, Volume 5, Issue 11, 1 November 2018

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

Meeting Date: November 15-16, 2018

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

Liaison Representative name: Dana Nguyen, BSN, RN, CIC, Clark County Public Health (WA)

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

Interim activities and updates:

- June 2018: NACCHO released an updated version of the [Healthcare-Associated Infections: A Toolkit for Local Health Departments](http://essentialelements.naccho.org/archives/7223) toolkit created in 2017 (<http://essentialelements.naccho.org/archives/7223>). The toolkit provides LHDs with guidance, best practices, tools, and resources for expanding activities related to improving local infection control, preparedness, and response. This toolkit was developed leveraging resources and lessons learned from our Lessons in INfection Control (LINC) Initiative demonstration sites.
- June 2018: NACCHO developed [a video](https://youtu.be/FHznk9vpKLk) (<https://youtu.be/FHznk9vpKLk>) that highlights the critical role that LHDs play in HAI prevention, control, and response. This video was published to the NACCHO website and blogs.
- June 28, 2018 NACCHO hosted a webinar to promote a Social Network Analysis Guide developed by the Florida Department of Health in Orange County. A recording of the webinar is available on NACCHO's [website](https://essentialelements.naccho.org/archives/10952) (<https://essentialelements.naccho.org/archives/10952>).
- NACCHO staff participated in the following meetings of the Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria (PACCARB): May 16, 2018 and September 26, 2018
- NACCHO staff and four local health department representatives participated on The Council for Outbreak Response: Healthcare-Associated Infections (HAIs) and Antimicrobial-Resistant Pathogens (CORHA) workgroup and All-Member calls. Stephanie Black, MD, MSc (Chicago, IL) and Hillary Hanson, MS, MPH, CIC (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, MD, MPH (LA County, CA) participates 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.
- Ongoing: NACCHO promotes HAI prevention and infection control news and resources via NACCHO's regular communication channels that reach nearly 3,000 LHDs.
- Last year, NACCHO provided technical assistance to demonstration projects with three local health departments to increase their capacity in preventing HAIs, combatting antimicrobial resistance, and improving antimicrobial stewardship in their communities. These demonstration sites were DuPage County Health Department (IL), Florida Department of Health in Orange County (FL), Philadelphia Department of Public Health.
 - DuPage County, IL
 - Developed antimicrobial stewardship advertisements for public education
 - Supported long-term care facilities in implementing core elements of antimicrobial stewardship in nursing homes
 - Philadelphia, PA

- Hosted an Antimicrobial Stewardship collaborative meeting to provide an opportunity for partners to communicate and learn more about AR issues from subject matter experts
- Conducted an antimicrobial stewardship survey among long term care facilities
- Supported staff in obtaining CIC-certification
- Orange County, FL and independent contractor
 - Developed a Social Network Analysis Toolkit;
 - Developed an Asymptomatic Bacteriuria toolkit;
 - Conducted a Return on Investment of prevention and infection control activities for HAI events assessment report
 - Supported staff in obtaining CIC-certification

Guidelines and Guidance:

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

- No guidance updates at this time.

Position Statements:

- NACCHO's Infectious Disease Prevention and Control Workgroup will be updating the following policy statements by July 2019.
 - National Healthcare Safety Network: Process for Sharing Healthcare-Associated Infection Data with LHDs
 - Antimicrobial Stewardship and Antimicrobial Resistance
- May 22, 2018: Signed onto S-Far FY19 appropriations letter
- July 18, 2018: Signed onto S-Far letter in response to proposal for a new antibiotic development reimbursement plan, emphasizing the role of stewardship and need for funding.

Legislation:

- No legislative updates at this time.

Campaigns and related activities:

- NACCHO continues to participate in the following campaign 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
 - Making Dialysis Safer for Patients Coalition
 - Compounding Quality Coalition
- November 12-18, 2018: NACCHO plans to participate in the U.S. Antibiotic Awareness Week (USAAW) campaign on our [Essential Elements blog](http://essentialelements.naccho.org/archives/12172) (<http://essentialelements.naccho.org/archives/12172>) as well as the NACCHO twitter account.
- NACCHO is participating in the Antimicrobial Resistance (AMR) Challenge and will be releasing our organizational AMR commitment during USAAW.

Press activities:

- No press updates at this time.

Publications:

- July 20, 2018: NACCHO supported Orange County's (FL) submission of a [Story from the Field](https://www.nacchostories.org/florida-epidemiologists-combating-hais-by-) (<https://www.nacchostories.org/florida-epidemiologists-combating-hais-by->

[becoming-cic-certified/](#)), highlighting their Certification in Infection Prevention and Control (CIC) Study Group developed to support staff to become certified, thereby improving Florida's capacity to respond to HAI outbreaks.

- June 4, 2018: NACCHO supported Allegheny County (PA) submission of a [Story from the Field](#) (<https://nacchovoice.naccho.org/2018/06/04/allegheny-county-health-department-assesses-antibiotic-stewardship/>) showcasing their work to assess and support efforts by healthcare facilities to promote judicious use of antibiotics.
- NACCHO published two updated factsheets on NACCHO's Healthcare-Associated Infection Initiative and Antimicrobial Resistance and Stewardship: Local Efforts on a Global Issue. Both factsheets are available on NACCHO's website.

Other items of note:

- NACCHO is preparing to conduct a national assessment of local health departments to identify what HAI activities local health departments are engaging in; to learn what the current capacity, structure, and involvement looks like at the local level; and to determine what is needed to strengthen LHD engagement in HAI work. The anticipated date for completion for this assessment is July 2019.
- NACCHO plans to support demonstration site projects for up to five local health departments to engage in HAI and AR work.

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

Meeting Date: November 15-16, 2018

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

Ex officio member name: David K. Henderson, M.D., Tara N. Palmore, M.D., Alternate

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

Interim activities and updates:

- The Clinical Center continues to conduct ongoing surveillance of our patients at admission and during ongoing hospitalization for carbapenemase producing organisms (CPO). We are now completing five years of active surveillance for CPO and are assembling the data to characterize our experience.
- The Clinical Center investigation of *Sphingomonas koreensis* infection and colonization has identified the source as our potable water supply. Eleven clonal infections were identified over a 12-year period. A manuscript describing these findings has been accepted for publication. We have attempted several interventions, most notably assuring adequate chlorine levels in both hot and cold water. Though our patient population continues to be substantially immunosuppressed, no additional infections have been detected for the past 21 months.
- We have completed the search for a new Chief of our Department of Laboratory Medicine and have chosen Karen Frank, M.D., Ph.D. as the new Chief. Dr. Frank has been the Chief of the Microbiology Section in the Department of Laboratory Medicine. Dr. Frank came to NIH from the University of Chicago. In that role she has led and/or participated in several collaborative research projects related to specific issues and threats for our patients, due to resistant Gram-negative bacteria. Her research team has investigated the horizontal transfer of the carbapenemase-encoding plasmids that are contributing to the spread of these resistance pathogens.

Guidelines and Guidance:

Position Statements:

Legislation:

Campaigns and related activities:

Press activities:

Publications:

1. Weingarten RA, Johnson RC, Conlan S, Ramsburg AM, Dekker JP, Lau AF, Khil1 P, Odom RT, Deming C, Park M, Thomas PJ, NISC Comparative Sequencing Program, Henderson DK, Palmore TN*, Julia A. Segre*, Karen M. Frank*. Genomic Analysis of Hospital Plumbing Reveals Diverse Reservoir of Bacterial Plasmids Conferring Carbapenem Resistance. MBio 2018 Feb; 9(1). Pii: e02011-17.
2. Daniel-Wayman S, Fahle G, Palmore T, Green KY, Prevots DR. Norovirus, astrovirus, and sapovirus among immunocompromised patients at a tertiary care research hospital. Diagn Microbiol Infect Dis. 2018 Oct;92(2):143-146.
3. Kadri SS, Adjemian J, Lai YL, Spaulding AB, Ricotta E, Prevots DR, Palmore TN, Rhee C, Klompas M, Dekker JP, Powers JH 3rd, Suffredini AF, Hooper DC, Fridkin S, Danner RL; National Institutes of Health Antimicrobial Resistance Outcomes Research Initiative (NIH-ARORI). Difficult-to-Treat Resistance in Gram-negative Bacteremia at 173 US Hospitals: Retrospective Cohort Analysis of Prevalence, Predictors, and Outcome of Resistance to All First-line Agents. Clin Infect Dis. 2018 Jul 23. doi: 10.1093/cid/ciy378. [Epub ahead of print]
4. Johnson RC, Deming C, Conlan S, Zellmer C, Michelin A, Lee-Lin S-Q, Thomas P J, Park M, NISC Comparative Sequencing Program, Weingarten RA, Less J, Dekker JP,

Frank KM, Musser KA, McQuiston JR, Henderson DK, Lau AF, Palmore TN, Segre JA. Genomic and epidemiologic investigation to identify *Sphingomonas koreensis* point sources in an indolent hospital outbreak. *Accepted for Publication*

Book Chapters:

1. Palmore TN, Parta M, Cuellar-Rodriguez J, Gea-Banacloche JC. "Infections in the cancer patient." in DeVita VT, Lawrence TS, Rosenberg SA eds. DeVita, Hellman, and Rosenberg's Cancer: Principles and Practices of Oncology, 11th ed., 2018. *In press.*

Other items of note:

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

Meeting Date: Nov 15-16 2018

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

Liaison Representative Name: Kathy Dunn

Organization represented: **Public Health Agency of Canada (PHAC)**

Interim activities and updates:

- [Tackling Antimicrobial resistance and antimicrobial use: A pan-Canadian framework for action](https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2017-43/ccdr-volume-43-11-november-2-2017/pan-canadian-framework-action-antimicrobial-resistance.html). Increasing focus at HAI program level (laboratory, surveillance, professional guidelines and public health practice). <https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2017-43/ccdr-volume-43-11-november-2-2017/pan-canadian-framework-action-antimicrobial-resistance.html>
- [The Canadian Nosocomial Infections Prevention Surveillance Program \(CNISP\)](https://www.canada.ca/en/public-health/services/infectious-diseases/nosocomial-occupational-infections/healthcare-acquired-infections-currently-under-surveillance.html) (<https://www.canada.ca/en/public-health/services/infectious-diseases/nosocomial-occupational-infections/healthcare-acquired-infections-currently-under-surveillance.html>)
- [The Canadian Antimicrobial Resistance Surveillance System. \(CARSS\)](https://www.canada.ca/en/public-health/services/publications/drugs-health-products/canadian-antimicrobial-resistance-surveillance-system-2017-report-executive-summary.html) (<https://www.canada.ca/en/public-health/services/publications/drugs-health-products/canadian-antimicrobial-resistance-surveillance-system-2017-report-executive-summary.html>)

Guidelines and Guidance:

- *Ebola*: Review and update of all PHAC EVD guidance completed, including recommendations for Biosafety, Laboratory, Healthcare settings and Public Health Measures. For HAI-IPC program two key documents were updated (awaiting approval for release & posting):
 - 1) Infection Prevention and Control Measures for Healthcare Setting
 - 2) Infection Prevention and Control Measures for Pre-Hospital care and Patient Transport
- *Prevention of Transmission of BBVs from Infected Healthcare Works in Healthcare Settings*. Project near completion with approval of final draft by National Advisory Committee. Translation and PHAC approvals for release in progress. Anticipate release date: 2019.
- CRE / CPE: IPC recommendations for healthcare settings – Quick Reference Guide, in development
- *Prevention and Control of Occupational Infections in Healthcare* – Revision of Section I (Overview Chapter) near completion.
- Canadian Influenza Preparedness Plan (CPIP): Healthcare Sector Annex: Update in progress

Campaigns and related activities:

- Annual Influenza Campaign, Infection Prevention and Control Week, Antibiotic Awareness Week in Canada
- Latest News on the PHAC [website](http://www.phac-aspc.gc.ca/) (<http://www.phac-aspc.gc.ca/>)

Publications:

- [The National Advisory Committee on Infection Prevention and Control \(NAC-IPC\)](https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly). T Ogunremi, K Dunn, L Johnston, J Embree on behalf of the National Advisory Committee on Infection Prevention and Control (NAC-IPC) (<https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly>)

[issue/2018-44/issue-11-november-1-2018/article-3-introducing-national-advisory-committee-infection-prevention-control.html?utm_source=lyris&utm_medium=email_en&utm_content=3&utm_campaign=ccdr_18-44-17\)](https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2018-44/issue-11-november-1-2018/article-3-introducing-national-advisory-committee-infection-prevention-control.html?utm_source=lyris&utm_medium=email_en&utm_content=3&utm_campaign=ccdr_18-44-17)

- [Something wicked this way comes: What health care providers need to know about *Candida auris*](https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2018-44/issue-11-november-1-2018/article-1-candida-auris-management.html?utm_source=lyris&utm_medium=email_en&utm_content=1&utm_campaign=ccdr_18-44-13) IS Schwartz, SW Smith, TC Dingle (https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2018-44/issue-11-november-1-2018/article-1-candida-auris-management.html?utm_source=lyris&utm_medium=email_en&utm_content=1&utm_campaign=ccdr_18-44-13)
- [Bringing home unwelcome souvenirs: Travel and drug-resistant bacteria](https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2018-44/issue-11-november-1-2018/article-2-travel-drug-resistant-bacteria.html?utm_source=lyris&utm_medium=email_en&utm_content=2&utm_campaign=ccdr_18-44-15) BJ Langford, K Schwartz (https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2018-44/issue-11-november-1-2018/article-2-travel-drug-resistant-bacteria.html?utm_source=lyris&utm_medium=email_en&utm_content=2&utm_campaign=ccdr_18-44-15)

Other items of note:

- Successful meeting of the National Advisory Committee on Infection Prevention and Control, held in Ottawa, Sept 2018 with national experts and stakeholder organizations in attendance.
- [PHAC Corporate Management Report: Program Evaluation of Healthcare-Associated Infection Activities](https://www.canada.ca/en/public-health/corporate/transparency/corporate-management-reporting/evaluation/results-glance-healthcare-associated-infection-activities-2012-2017.html) (<https://www.canada.ca/en/public-health/corporate/transparency/corporate-management-reporting/evaluation/results-glance-healthcare-associated-infection-activities-2012-2017.html>)

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

Meeting Date: 15-16 November, 2018

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

Liaison Representative name: Andi L. Shane

Organization represented: **Pediatric Infectious Disease Society (PIDS)**

Interim activities and updates:

- This is the first HICPAC meeting attended by a representative from the Pediatric Infectious Disease Society. PIDS is the world's largest organization of professionals dedicated to the treatment, control, and eradication of infectious diseases affecting children. From fellowship training to continuing medical education, research, regulatory issues, and guideline development, PIDS members are the core professionals advocating for the improved health of children with infectious diseases both nationally and around the world, participating in critical public health and medical professional advisory committees that determine the treatment and prevention of infectious diseases, immunization practices in children, and the education of pediatricians.

Guidelines and Guidance:

- PIDS was pleased to endorse the Society for Healthcare Epidemiology of America (SHEA) white paper: SHEA neonatal intensive care unit (NICU) white paper series: Practical Approaches to *Clostridioides difficile* prevention published electronically in August 2018. The PIDS representative on the NICU Advisory Board charged with developing the white paper series is Aaron Milstone.

Campaigns and related activities:

- PIDS participated in the Antimicrobial Resistance Commitments with the United Nations General Assembly meeting dedicated to this topic. Members were invited to sign a commitment letter.

Publications:

- Publication of the *Handbook of Pediatric Infection Prevention and Control* expected in the spring of 2019. This publication addresses infection prevention topics that pediatric providers must tackle in diverse settings: ambulatory clinics, emergency departments, community hospitals, and freestanding university children's hospitals

Other items of note:

- PIDS is the recipient of an unrestricted educational grant from Sanofi Pasteur U.S. to make The Vaccine Handbook: A Practical Guide for Clinicians 2018 app available free of charge. TVH ("The Purple Book") is a uniquely comprehensive source of practical, up-to-date information for vaccine providers and educators. It draws together the latest vaccine science and guidance into a concise, user-friendly, practical resource for the private office, public health clinic, academic medical center, and hospital.

The Vaccine Handbook App provides

- Information on every licensed vaccine in the United States
- Rationale behind authoritative vaccine recommendations
- Contingencies encountered in everyday practice
- Advice on how to address concerns about vaccines
- Background on how vaccine policy is made
- Standards and regulations
- Office logistics, including billing

- PIDS will co-sponsor the 10th Annual International Antimicrobial Stewardship Conference to be held May 30-31, 2019 at Washington University in St. Louis, Missouri. Conference organizers are currently finalizing another outstanding program including the Thursday morning basics of antimicrobial stewardship session targeted toward medical and pharmacy residents and fellows as well as people just starting their antimicrobial stewardship program.
- The Pediatric Committee on Antimicrobial Stewardship has partnered with the American Academy of Pediatrics section on Infectious Diseases and Healthcare without Harm to develop a toolkit for inpatient and outpatient antimicrobial stewardship which will be available electronically.

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

Meeting Date: November 15-16, 2018

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

Liaison Representative name: Craig Coopersmith, MD, FCCM

Organization represented: **Society of Critical Care Medicine (SCCM)**

Guidelines and Guidance:

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

- **Published**
 - [Guidelines for the Prevention and Management of Pain, Agitation/Sedation, Delirium, Immobility, and Sleep Disruption in Adult Patients in the ICU](http://www.sccm.org/Research/Guidelines/Guidelines/Guidelines-for-the-Prevention-and-Management-of-Pa) (<http://www.sccm.org/Research/Guidelines/Guidelines/Guidelines-for-the-Prevention-and-Management-of-Pa>) *Crit Care Med. 2018 Sep;46(9):e825-e873* Published
 - [Diagnosis and Management of CIRCI in Critically Ill Patients \(Part II\)](http://www.sccm.org/Research/Guidelines/Guidelines/Guidelines-for-the-Diagnosis-and-Management-of-(1)) ([http://www.sccm.org/Research/Guidelines/Guidelines/Guidelines-for-the-Diagnosis-and-Management-of-\(1\)](http://www.sccm.org/Research/Guidelines/Guidelines/Guidelines-for-the-Diagnosis-and-Management-of-(1))) *Crit Care Med 2018; 46(1):146-148*
- **In Development (*related to CDC work)**
 - 1) Criteria for Critical Care Infants and Children: PICU Admission, Discharge and Triage Guidelines and Levels of Care: SCCM and AAP
 - 2) Pediatric and Neonatal Analgesia and Sedation in the ICU: pain, agitation and delirium
 - 3) *Guidelines for the evaluation of adult new fever in the ICU: a 2008 update SCCM and IDSA
 - 4) Management of the critically ill adult patient with liver disease
 - 5) Guidelines for stress ulcer prophylaxis in adult critically ill patients
 - 6) Rapid sequence intubation in adults
 - 7) Update: Guidelines for the use of an insulin infusion for the management of hyperglycemia in critically ill patients
 - 8) *Surviving Sepsis Campaign guidelines for the management of adult sepsis and septic shock
 - 9) *Surviving Sepsis Campaign guidelines for the management of sepsis and septic shock in children
 - 10) Failure to rescue
 - 11) Update 2004: Inter- and intra-hospital transport of critically ill patients

Position Statements:

Ethics of Outbreaks Position Statement. Part 1: Therapies, Treatment Limitations, and Duty to Treat. Papadimos, Thomas J., MD, MPH^{1,2}; Marcolini, Evadne G., MD³; Hadian, Mehrnaz, MD⁴; Hardart, George E., MD⁵; Ward, Nicholas, MD⁶; Levy, Mitchell M., MD⁶; Stawicki, Stanislaw P., MD, MBA⁷; Davidson, Judy E., DNP, RN⁸ *Critical Care Medicine: [November 2018 - Volume 46 - Issue 11 - p 1842–1855](#). doi: 10.1097/CCM.0000000000003416. (<https://journals.lww.com/ccmjournal/pages/currenttoc.aspx>)*

Legislation:

- None

Campaigns and related activities:

- Surviving Sepsis Campaign issued an update to the adult bundles based on the 2016 guidelines. Concern expressed by emergency physicians in the United States included time to completion perceptions and the long standing time stamp of bundles starting at triage time. SCCM/ESCIM and ACEP are in discussions on the matter presently.

- The Surviving Sepsis Campaign (SSC) released findings from the internationally focused research committee revealing the top six clinical priorities for sepsis research. The manuscript on these findings, [Surviving Sepsis Campaign Research Priorities for Sepsis and Septic Shock](https://journals.lww.com/ccmjournal/Fulltext/2018/08000/Surviving_Sepsis_Campaign_Research_Priorities.17.aspx) (https://journals.lww.com/ccmjournal/Fulltext/2018/08000/Surviving_Sepsis_Campaign_Research_Priorities.17.aspx) was co-published in Critical Care Medicine and Intensive Care Medicine. Presentation of the findings were offered at the ESICM annual congress meeting in Paris and will be featured in a concurrent session at the SCCM's annual Congress. The Campaign also released a capstone paper on the sepsis in resource limited nations study conducted in Gitwe, Rwanda, [Increasing Evidence-Based Interventions in Patients with Acute Infections in a Resource-Limited Setting](https://journals.lww.com/ccmjournal/Fulltext/2018/08000/Increasing_Evidence_Based_Interventions_in_Patients_with_Acute_Infections_in_a_Resource-Limited_Setting_in.18.aspx) (https://journals.lww.com/ccmjournal/Fulltext/2018/08000/Increasing_Evidence_Based_Interventions_in.18.aspx). SCCM continues collaboration with ESICM via the SSC on guidelines for recognition and treatment of sepsis and septic shock for children with a release in late 2019. Since sepsis continues to be a devastating consequence of infection, SCCM has commissioned a task force to develop and disseminate a definition for children's sepsis and continues to consult with the World Health Organization on initiatives and policies to address this global health crisis.
- In September 2018 SCCM released the long-awaited and updated [Guidelines for the Prevention and Management of Pain, Agitation/Sedation, Delirium, Immobility and Sleep](https://journals.lww.com/ccmjournal/Fulltext/2018/09000/Clinical_Practice_Guidelines_for_the_Prevention_and_Management_of_Pain,_Agitation/Sedation,_Delirium,_Immobility_and_Sleep_or_the_Prevention.29.aspx) (https://journals.lww.com/ccmjournal/Fulltext/2018/09000/Clinical_Practice_Guidelines_for_the_Prevention.29.aspx). These guidelines intended for adult patients, reveal the evidence that supported the 76-hospital collaborative completed in 2017 implementing the complementary ABCDEF bundle components of SCCM's ICU Liberation Campaign. The collaborative findings were released in Critical Care Medicine, [Caring for Critically Ill Patients with the ABCDEF Bundle: Results of the ICU Liberation Collaborative in over 15,000 adults](https://journals.lww.com/ccmjournal/Abstract/onlinefirst/Caring_for_Critically_Ill_Patients_with_the_ABCDEF_Bundle:_Results_of_the_ICU_Liberation_Collaborative_in_over_15,000_adults) (https://journals.lww.com/ccmjournal/Abstract/onlinefirst/Caring_for_Critically_Ill_Patients_with_the_ABCDEF.96108.aspx). This key stone paper demonstrates that the A-F bundle is associated with lower likelihood of hospital death, next-day mechanical ventilation, physical restraint use, ICU readmission, and discharge to a location other than home. Cost savings and harm reduction are primary findings. The guidelines, online learning program, website, book and simulation course provide clinicians with the tools needed to implement the Campaign within their ICUs. The ICU Liberation Committee is also developing a minimal dataset to be used for quality improvement and a bedside app to be released in 2019. SCCM will expand benchmarking data services for ICU Liberation through the data center within the Society's Discovery Research Network.

Publications:

- See links above

Other items of note:

Annual Congress

48th Critical Care Congress

February 17-20, 2019

San Diego Convention Center

San Diego, California, USA

[Advance Program](#)

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

Meeting Date: November 15-16, 2018

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

Liaison Representative name: Louise-Marie Dembry, MD, FACP, MS, MBA, FSHEA

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

Interim activities and updates:

SHEA Spring 2019: Science Guiding Prevention

April 24-26 | Boston, MA

The SHEA Spring 2019 conference will be held from April 24-26, in Boston, MA with direction from the Program Committee Chair, Dr. Judy Guzman-Cottrill and Vice Chair, Dr. Thomas Sandora. Building upon the success of 2018 while also adding some additional features to the program, the chairs wanted to highlight the following:

- SHEA 2019 will provide an innovative, provocative, and in-depth scientific program applicable to healthcare epidemiologists in all settings (academic center, community hospital, post-acute care, etc.)
- Two Certificate Courses:
 - SHEA/CDC Training Certificate Course in Healthcare Epidemiology
 - SHEA Antibiotic Stewardship Training Course
- 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
- Focused scientific abstracts related to healthcare epidemiology, surveillance, implementation science and patient safety, and prevention strategies
- Poster and oral abstract awards for all career levels
- Targeted Networking Breakfasts and Breaks
 - Annual SHEA Mentorship Program
 - Women in Epi Networking Event
 - SHEA Epi Project Competition
- SHEA Education & Research Foundation Dinner (Extra Purchase Required)
- Continuation of the Pre – Meeting Workshop: *Human Factors Engineering for Infection Control* (Extra Purchase Required)

Registration and abstract submission is now open! To find out more and register, please visit the meeting [website \(http://sheaspring.org/\)](http://sheaspring.org/).

Applications for Scholarships for SHEA Spring 2019 Conference are now being accepted.

If you know someone interested, direct them to the SHEA [website \(www.sheaspring.org\)](http://www.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 healthcare associated 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 each receive \$500 to defray the expenses of attending the program. In addition to the \$500, 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 a \$500 grant to defray the expenses of attending the program. In addition to the \$500, 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 a \$500 grant to defray the expenses of attending the program. In addition to the \$500, 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 Research Scholar Program**

The SHEA Education and Research Foundation is awarding a minimum of two research grants in 2019 to bright and dedicated young investigators in the field of healthcare epidemiology and antibiotic stewardship research. Eligible applicants are SHEA members who are early investigators with a MPH, PhD, PharmD, MD, or similar degree and are within 5 years of completion of training. There are two opportunities to receive funding:

- **Epi Project Competition**

Eligible early investigators are invited to submit a research proposal for a chance at receiving a \$20,000 research grant. At least four finalists are invited to deliver an oral presentation of their proposal at the SHEA Spring Conference where the winner is selected and announced on site. **Proposals will be accepted beginning December 2018.**

- **Research Scholar Award**

The award was given for the first time in 2018. The winner is Dr. Valeria Fabre of The Johns Hopkins University for her research proposal, "Improving Blood Culture Ordering Practices in Hospitalized Adult Patients." Eligible early investigators are invited to submit a research proposal for a chance at receiving a \$40,000 research grant. The winner will be announced at IDWeek and will be asked to present preliminary research results at the SHEA Spring Conference. **Proposals will be accepted following the SHEA 2019 Spring Conference.**

For more information visit the [website \(http://www.shea-online.org/index.php/foundation/research-scholars-program\)](http://www.shea-online.org/index.php/foundation/research-scholars-program).

6th Decennial International Conference on Healthcare Associated Infections

March 26-30, 2020 | Atlanta, GA

The Centers for Disease Control and Prevention (CDC) and the Society for Healthcare Epidemiology of America (SHEA) have begun planning for the 2020 Decennial International Conference, which is focusing on global perspectives for addressing issues of healthcare associated infections and antibiotic resistance. The Decennial will take place in Atlanta at the Atlanta Marriott Marquis on March 26-30, 2020. The 2020 Decennial Steering Committee members include Denise Cardo, MD, CDC, Arjun Srinivasan, MD, CDC, Keith Kaye, MD SHEA, Linda Green, RN, APIC, Bill Powderly, MD, IDSA, Didier Pittet, MD, MS, Jan Patterson, MD, and John McGowan, MD, Advisor. The meeting frame work has been designed by the Steering Committee as a guide for the program committee to utilize when developing the Decennial 2020 Program.

The Program Committee with direction from the Committee Chairs, Daniel Diekema, MD, SHEA, Deborah Yokoe, MD, MPH, SHEA, John Jernigan, MD, MS, CDC, and Benjamin Park, MD, CDC had their first planning meeting September 20 – 21 to start the development of Plenaries, Meet the Consultants, and Symposiums. The Program Committee will also start work on the development of workshops, additional networking opportunities, abstract reviews/selection and professorial rounds. The next meeting will occur between the four chairs on November 16.

Antimicrobial Stewardship Research Workshop

Planning for the final workshop was held back in May in Baltimore, led by Drs. Elizabeth Dodds-Ashely and Jeffrey Gerber. The committee also updated the program agenda to include more round table workshops which will provide interaction amongst participants and facilitators. There are also concurrent sessions on the second day. During Registration, attendees get to choose which of 3 sessions they would like to attend. Another new addition is a “Research in the Real World” session. A past workshop attendee was invited to present what they learned at the workshop and how they have implemented what they learned back at their institution. The workshop program agenda has been solidified and all speakers have accepted their invitations. You can find more information about the workshop [online \(www.asresearchworkshop.org\)](http://www.asresearchworkshop.org).

Online Learning

SHEA launched its Online Education Center - LearningCE on April 18th, 2018. This Learning Management System houses all SHEA’s online learning. This system is available to both members and non-members. Users can learn about innovative topics at their own pace and track their progress while earning CME credits. Top programming includes the Primer on Healthcare Epidemiology, Infection Control & Antimicrobial Stewardship, the SHEA Spring 2018 Full Conference Recordings, and the Antimicrobial Stewardship Research Workshop Registration. New educational programs in development include a podcast series on Infection Control Basics, a webinar series on Quality Improvement, and Journal CME from top ICHE articles. This easy-to-use platform offers a variety of education all located in the Course Catalog and provides unique user transcripts to keep track of all completed courses, CME earned, and certificates.

IDWeek 2018

Drs. Ebbing Lautenbach (chair) and Kristina Bryant, MD (vice chair) and SHEA committee representatives: Drs. Hilary Babcock, Shelley Magill, Tara Palmore, and Thomas Talbot identified the sessions for Category N & S for IDWeek 2018. These categories were represented with 2 Pre-Meeting Workshop, 7 MTPs, 3 Interactive Sessions, and 14 Symposiums. Jan E. Patterson, MD, MS presented 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 with over 200 registrants. SHEA also executed a new Workshop entitled Changing Hearts and Minds: A Sociobehavioral Approach to Antimicrobial Stewardship and Infection Prevention, led by Julia Szymczak, PhD and Neil Fishman, MD with over 150 registrants. IDWeek 2018 had the highest attendance yet for 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). To date, 40 Physicians have claimed MOC and since its launch, 1132 individuals have purchased this course (923 Fellows and 208 Physicians). The SHEA Education Committee is reviewing, editing and updating four modules Respiratory, MDRO, SSI, and Stewardship as they were determined to be the most out of date. The committee will also make minor changes to the other modules such as edits to links. The primer is set to relaunch early 2019.

Guidelines and Guidance:

Published:

- SHEA [Expert Guidance](https://doi.org/10.1017/ice.2017.245): Duration of Contact Precautions (<https://doi.org/10.1017/ice.2017.245>), Co-Chairs David Banach and Gonzalo Bearman)
- SHEA/CDC ORTP [Toolkits](https://ortp.guidelinecentral.com) (<https://ortp.guidelinecentral.com>)
- SHEA NICU White Paper [Series](https://doi.org/10.1017/ice.2018.209): *C. difficile* (<https://doi.org/10.1017/ice.2018.209>, Co-Chairs Tom Sandora and Allison Bartlett)
- SHEA Expert Guidance: Infection Prevention in Anesthesia Expert Guidance (accepted for publication in ICHE, Chair Silvia Munoz-Price)

In development:

- Initiation of Antibiotics (Co-Chairs Chris Crnich and Theresa Rowe)
- NICU White Paper Series (*S. aureus*, Chair Aaron Milstone; respiratory infections, CLABSI)
- SHEA Healthcare Workers Infected with Bloodborne Pathogens (white paper, Co-Chairs Louise Dembry and David Henderson)
- Sterilization and High Level Disinfection (Co-Chairs Erica Shenoy and David Weber)
- Infection Prevention in LTC (2-part expert guidance, Co-Chairs Lona Mody and Rekha Murthy)
- Planning for SHEA/IDSA Compendium 2020 Update

In addition to the above published documents, the GLC reviewed in 2018:

- HICPAC Draft Update to the CDC Infection Prevention and Control Recommendation Categorization Scheme (no comments)
- IDSA/SHEA *C. difficile* Practice Guidelines Update (endorsed)
- AAAAI-IDSA-SHEA Penicillin Allergy Consensus (endorsed, accepted for publication in JAMA)
- IDSA Seasonal Influenza (endorsed)
- IDSA Asymptomatic Bacteriuria Guideline (endorsed)
- PHAC Infected Healthcare Provider Guideline (comments submitted, awaiting revisions)
- MITIGATE Urgent Care and ED Stewardship Tool Kit (approved for dissemination)
- Animal-Assisted Interventions Manual (IPC recommendations supported)
- Review of SHEA guidelines/guidance for “current” status:
 - SHEA: 2014 Healthcare Personnel Attire (current)
 - SHEA/CFF IPC for Cystic Fibrosis (current, with suggestions for next update)
 - ASHP, SHEA, IDSA, SIS Clinical Practice Guidelines for Antimicrobial Prophylaxis in Surgery (ASHP intends to begin update in 2019)

Policy:

SHEA recently rolled out an online Advocacy Toolkit for grassroots advocates. This toolkit is a package of resources and educational materials to assist SHEA members with becoming

effective advocates to policymakers at the federal and state level on behalf of the society's policy agenda. It is an exclusive SHEA member benefit designed to show members how to be an effective advocate and stay informed on the most critical or priority issues for the profession.

Campaigns and related activities:

- **Outbreak Prevention and Response Week**

SHEA launched Outbreak Prevention and Response Week from September 17-21, 2018. During the week, SHEA and its partners (including IDSA) shared resources with healthcare professionals, the infection prevention community, and patients and families on ways to prevent the spread of infectious diseases.

Tapping into the expertise of the healthcare epidemiologist and other healthcare professionals in outbreak prevention and response, SHEA led discussions and shared tips and information on five themes:

- 1) Preventing Healthcare-Associated Infections
- 2) Antibiotic Stewardship and Risks of Multidrug Resistant Organisms
- 3) Partnerships: Public Health and Community Response
- 4) Preparedness: Facility Resource Allocation & Outbreak Response and Incident Management
- 5) Sustainability: Research & Funding

The goal of the week was to position the importance of healthcare epidemiology in outbreak situations and beyond.

Press activities:

All of SHEA's press releases can be found [online](http://www.shea-online.org/index.php/journal-news/press-room/press-release-archives) (<http://www.shea-online.org/index.php/journal-news/press-room/press-release-archives>). Here are the most recent press statements:

- Antibiotic Resistance Increases Relapse in Urinary Tract Infections - October 30, 2018
- Infectious Diarrhea Spores Survive High Temperatures of Hospital Laundering - October 16, 2018
- Sink Traps are Surprising Source of Antibiotic-Resistant Bacteria in ICU - October 05, 2018
- SHEA Joins HHS and CDC as a Proud Partner of the AMR Challenge- September 25, 2018
- Even the Best Healthcare Facilities Can Do More to Prevent Infections - September 20, 2018
- Telehealth Proves Valuable for Promoting Safe Antibiotic Prescribing Practices in Remote Healthcare Settings -September 6, 2018
- Guidance for Preventing C. difficile in Neonatal Intensive Care - August 30, 2018
- CMS Policy to Reduce Hospital-Acquired Conditions had Minimal Impact - June 28, 2018
- Prioritize Individual and Public Health at the Border - June 26, 2018
- Providers Preferences May be Helpful in Reducing Inappropriate Antibiotic Prescriptions - June 07, 2018
- Increased Sustainable Federal Funding Required for Effective Emergency Preparedness - May 31, 2018
- Experts in Infection Prevention and Control Publish Two New Textbooks - May 31, 2018

Publications:

- Practical Healthcare Epidemiology, [4th Edition](https://doi.org/10.1017/9781316597170) (<https://doi.org/10.1017/9781316597170>)
- [Practical Implementation of an Antibiotic Stewardship Program](https://doi.org/10.1017/9781316694411) (<https://doi.org/10.1017/9781316694411>)

Other items of note:

- **SHEA'S New ICHE Managing Editor**

Lindsay MacMurray has joined as the new Managing Editor of ICHE. Ms. MacMurray joins as a full time SHEA employee to provide editorial and strategic support for ICHE. She can be reached at lmacmurray@shea-online.org.

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

Meeting Date: November 15-16, 2018

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 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.

- SHM's High-Value Care Subcommittee is currently working to develop the second iteration of the Choosing Wisely topics (Choosing Wisely 2.0).
- SHM's Quality Improvement Strategy Subcommittee is currently developing four educational online modules that aim to educate SHM members on best practices for implementing quality improvement projects geared towards improving four of the choosing wisely topics: CAUTI, Blood Transfusion, Laboratory Testing, and Telemetry.

Position Statements:

- None at this time

Legislation:

- None at this time

Campaigns and related activities:

- None at this time

Press activities:

- None at this time

Publications:

- [Prevalence of Staphylococcus aureus and Use of Antistaphylococcal Therapy in Children Hospitalized with Pneumonia](https://www.journalofhospitalmedicine.com/jhospmed/article/176699/hospital-medicine/prevalence-staphylococcus-aureus-and-use) (<https://www.journalofhospitalmedicine.com/jhospmed/article/176699/hospital-medicine/prevalence-staphylococcus-aureus-and-use>)
- [The Association of Inpatient Occupancy with Hospital-Acquired Clostridium difficile Infection](https://www.journalofhospitalmedicine.com/jhospmed/article/167206/hospital-medicine/association-inpatient-occupancy-hospital-acquired) (<https://www.journalofhospitalmedicine.com/jhospmed/article/167206/hospital-medicine/association-inpatient-occupancy-hospital-acquired>)
- [Community-Acquired Pneumonia. 2017 Hospital Medicine Revised Core Competencies](https://www.journalofhospitalmedicine.com/jhospmed/article/166148/hospital-medicine/community-acquired-pneumonia-2017-hospital-medicine) (<https://www.journalofhospitalmedicine.com/jhospmed/article/166148/hospital-medicine/community-acquired-pneumonia-2017-hospital-medicine>)
- [Prevention of Healthcare-Associated Infections and Antimicrobial Resistance. 2017 Hospital Medicine Revised Core Competencies](https://www.journalofhospitalmedicine.com/jhospmed/article/165063/hospital-medicine/prevention-healthcare-associated-infections-and) (<https://www.journalofhospitalmedicine.com/jhospmed/article/165063/hospital-medicine/prevention-healthcare-associated-infections-and>)

Other items of note:

- The Hospitalist

- [Residents curb IV antibiotic overuse in children \(https://www.the-hospitalist.org/hospitalist/article/175418/pediatrics/residents-curb-iv-antibiotic-overuse-children\)](https://www.the-hospitalist.org/hospitalist/article/175418/pediatrics/residents-curb-iv-antibiotic-overuse-children)
- [FDA attacks antibiotic resistance with new strategy \(https://www.the-hospitalist.org/hospitalist/article/174874/antimicrobial-resistant-infections/fda-attacks-antibiotic-resistance-new\)](https://www.the-hospitalist.org/hospitalist/article/174874/antimicrobial-resistant-infections/fda-attacks-antibiotic-resistance-new)
- [Antibiotic stewardship in sepsis \(https://www.the-hospitalist.org/hospitalist/article/166993/infectious-diseases/antibiotic-stewardship-sepsis\)](https://www.the-hospitalist.org/hospitalist/article/166993/infectious-diseases/antibiotic-stewardship-sepsis) (an article covering a topic that was covered at SHM's Annual Conference in Orlando)

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

Meeting Date: November 15-16, 2018

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 Boston, CA, 22 October. Planning has begun for the next meeting, which will be co-located with the Shock Society in San Diego. Progress has also been made on the Patient Generated Health Data imaging initiative performed through a contract with the CDC.

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:

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

Publications:

- CCESS [Antibiotics versus No Antibiotics for the Treatment of Acute Uncomplicated Diverticulitis: Review of the Evidence and Future Directions](#) (<https://www.liebertpub.com/doi/10.1089/sur.2018.115>) Jared M. Huston (<https://www.liebertpub.com/author/Huston%2C+Jared+M>), Brian S. Zuckerbraun (<https://www.liebertpub.com/author/Zuckerbraun%2C+Brian+S>), Laura J. Moore (<https://www.liebertpub.com/author/Moore%2C+Laura+J>), James M. Sanders (<https://www.liebertpub.com/author/Sanders%2C+James+M>), and Therese M. Duane (<https://www.liebertpub.com/author/Duane%2C+Therese+M>); Pages:648–654; Published Online:11 September 2018
- [Diagnosis of Periprosthetic Joint Infection Using Polymerase Chain Reaction: An Updated Systematic Review and Meta-Analysis](#) (<https://www.liebertpub.com/doi/10.1089/sur.2018.014>). Yang Jun (<https://www.liebertpub.com/author/Jun%2C+Yang>) and Liu Jianghua (<https://www.liebertpub.com/author/Jianghua%2C+Liu>); Pages:555–565; Published Online:19 June 2018
- [Bowel Perforation Resulting in Necrotizing Soft-Tissue Infection of the Abdomen, Flank, and Lower Extremities](#) (<https://www.liebertpub.com/doi/10.1089/sur.2018.022>). Disha Kumar (<https://www.liebertpub.com/author/Kumar%2C+Disha>), Nicolás W. Cortés-Penfield (<https://www.liebertpub.com/author/Cort%C3%A9s-Penfield>)

[Penfield%2C+Nicol%C3%A1s+W](#)), [Hanine El-Haddad](#)
(<https://www.liebertpub.com/author/El-Haddad%2C+Hanine>), and [Daniel M. Musher](#)
(<https://www.liebertpub.com/author/Musher%2C+Daniel+M>); Pages:467–472; Published
Online:12 June 2018