

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

May 17-18, 2018

Atlanta, Georgia

Record of the Proceedings

Contents

Healthcare Infection Control Practices Advisory Committee.....	1
Meeting Agenda	4
List of Attendees.....	6
Executive Summary.....	10
Thursday, May 17, 2018.....	11
Welcome and Introductions	11
CDC Updates: Division of Healthcare Quality Promotion (DHQP)	11
Discussion Points.....	15
Neonatal Intensive Care Unit (NICU) Guideline Workgroup Update	15
Discussion Points.....	26
Healthcare Personnel Infection Control Exposures.....	31
Discussion Points.....	33
NHSN Update.....	34
Recent Issues / Future Plans	34
Technology and Informatics	36
Discussion Points.....	37
NHSN Workgroup Update	38
Background/Overview: NHSN Workgroup & Data and Definitions Subgroup	38
Discussion Points.....	43
Background/Overview: Reports and Communication Subgroup	45
Discussion Points.....	47
Motion/Vote: Removal of Age Requirement from the CAUTI Surveillance Definition	49
Products and Practices Workgroup Update	49
Discussion Points.....	51
C. auris Update	53
Discussion Points.....	55
Public Comment	58
Liaison / Ex Officio Reports	59
American College of Occupational and Environmental Medicine (ACOEM)	59
American College of Surgeons (ACS)	59
America’s Essential Hospitals (AEH).....	60
Agency for Healthcare Research and Quality (AHRQ)	60
Association of periOperative Registered Nurses (AORN).....	61
Association of Professionals of Infection Control and Epidemiology (APIC)	62
American Nurses Association (ANA).....	62

Association of State and Territorial Health Officials (ASTHO)	62
Centers for Medicare and Medicaid Services (CMS)	62
Council of State and Territorial Epidemiologists (CSTE)	62
Consumers Union (CU).....	62
DNVGL Healthcare, Inc.....	63
Food and Drug Administration (FDA)	63
Health Resources and Services Administration (HRSA)/ Federal Office of Rural Health Policy (FORHP)	64
Infectious Diseases Society of America (IDSA)	64
National Association of County and City Health Officials (NACCHO)	64
National Institutes of Health (NIH)	64
Public Health Agency of Canada (PHAC).....	64
Society for Critical Care Medicine (SCCM).....	65
Society for Healthcare Epidemiology of America (SHEA)	65
Society of Hospital Medicine (SHM)	67
Surgical Infection Society (SIS).....	67
The Joint Commission (TJC).....	67
US Department of Veteran’s Affairs (VA)	67
Adjourn.....	67
Friday, May 18, 2018.....	68
Welcome and Roll Call	68
Healthcare Personnel Guideline Workgroup Update.....	68
Discussion Points.....	73
Motion/Vote: Approval of Draft Mumps Recommendations and Narrative	74
Motion/Vote: Approval of Draft Rubella Recommendations and Narrative.....	74
Updated Recommendations for Tuberculosis Screening and Testing of Healthcare Personnel, United States, 2018	74
Discussion Points.....	77
Healthcare-Associated Infection Vaccines	82
Discussion Points.....	86
Public Comment	87
Summary and Work Plan.....	88
Adjourn.....	88
Certification	89
Attachment #1: Acronyms Used in this Document.....	90
Attachment #2: Liaison Representative / ex officio Member Reports	94

Meeting Agenda

Healthcare Infection Control Practices Advisory Committee
 May 17-18, 2018
 Centers for Disease Control and Prevention
 Tom Harkin Global Communications Center (Building 19, Aud. B)
 1600 Clifton Rd., NE, Atlanta, GA

Thursday, May 17, 2018

Time	Topic	Purpose	Presider/Presenter (s)
9:00am	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)
9:45	NICU Guideline Update: Update and Draft Recommendations	Information/ Discussion	Kristina Bryant (HICPAC)
11:00	Break	-	-
11:15	Healthcare Personnel Infection Control Exposures	Information/ Discussion	David Kuhar (DHQP, CDC)
11:45	Lunch	-	-
1:00	NHSN Update	Information/ Discussion	Dan Pollock (DHQP, CDC) Sheri Chernetsky Tejedor (DHQP, CDC)
1:30	NSHN Workgroup Update <ul style="list-style-type: none"> • Data and Definitions • Reports and Communications 	Information/ Discussion	Deborah Yokoe (HICPAC) Michael Howell (HICPAC)
3:00	Break	-	-
3:15	Products and Practices Workgroup Update	Information/ Discussion	Vineet Chopra (HICPAC)
4:00	<i>C. auris</i> Update	Information	Snigdha Vallabhaneini (DFWED, CDC)
4:15	Public Comment	-	-
4:30	Liaison / <i>ex officio</i> Reports	-	-
5:00	Adjourn	-	-

Friday, May 18, 2018

Time	Topic	Purpose	Presider/Presenter (s)
9:00am	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	-	-
11:15	Targeted Update: 2005 Guideline for TB Prevention in Healthcare Settings – Testing and Surveillance in HCP	Information/ Discussion	Lynn Sosa (Connecticut Department of Health) Robert Belknap (Denver Public Health)
11:00	HAI Vaccines	Information	Anthony Fiore (DHQP, CDC)
11:30	Public Comment	-	-
11:45	Summary and Work Plan	-	-
12:00pm	Adjourn	-	-

List of Attendees

Day 1: May 17, 2018

HICPAC Members

Dr. Daniel Diekema, Co-Chair
Dr. Deborah Yokoe, Co-Chair
Ms. Vickie Brown
Dr. Kristina Bryant
Dr. Vineet Chopra
Dr. Michael Howell
Dr. Lisa Maragakis
Dr. Jan Patterson

ex officio Members

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

Liaison Representatives

Ms. Elaine Dekker, America's Essential Hospitals (AEH)
Dr. Mark Russi, American College of Occupational and Environmental Medicine (ACOEM)
Dr. Elizabeth Wick, American College of Surgeons (ACS)
Ms. Sharon Morgan, American Nurses Association (ANA)
Ms. Amber Wood, Association of periOperative Registered Nurses (AORN)
Ms. Silvia Quevedo, Association of Professionals of Infection Control and Epidemiology (APIC)
Ms. Kristen Ehresmann, Association of State and Territorial Health Officials (ASTHO)
Ms. Lisa McGiffert, Consumers Union (CU)
Ms. Linda Spaulding, DNVGL Healthcare
Ms. Dana Nguyen, National Association of County and City Health Officials (NACCHO)
Ms. Kathleen Dunn, Public Health Agency of Canada (PHAC)
Dr. Pamela Smithburger, Society for Critical Care Medicine (SCCM)
Dr. Louise Demby, Society for Healthcare Epidemiology of America (SHEA)
Dr. Robert Sawyer, Surgical Infection Society (SIS)
Dr. Valerie Vaughn, Society of Hospital Medicine (SHM)
Ms. Margaret VanAmringe, The Joint Commission (TJC)

CDC Representatives

Fran Abanyie, CDC/DHQP
Denise Albina, CDC/DHQP
Jeneita Bell, CDC/DHQP
Michael Bell, CDC/DHQP
Shantel Benjamin, CDC/DHQP
Isaac Benowitz, CDC/DHQP
Kathy Bridson, CDC/DHQP
Toni Brown, CDC/DHQP
Stefanie Bumpus, CDC/DHQP
Susan Cali, CDC/DHQP

Denise Cardo, CDC/DHQP
Koo-Whang Chung, CDC/DHQP
Sarah Collins, CDC/DHQP
Kendra Cox, CDC/DHQP
Maggie Dudeck, CDC/DHQP
Ryan Fagan, CDC/DHQP
Janet Glowicz, CDC/DHQP
Dominique Godfrey, CDC/DHQP
Jeremy Goodman, CDC/DHQP
Alison Halpin, CDC/DHQP
Rosa Herrera, CDC/DHQP

Jamesa Hogges, CDC/DHQP
Demetria Ihenacho, CDC/DHQP
Kathleen Irwin, CDC/DHQP
Cecilia Joshi, CDC/DHQP
David Kuhar, CDC/DHQP
Yeon Lee, CDC/DHQP
Denise Leaprot, CDC/DHQP
Ruth Link-Gelles, CDC/DHQP
Anita McLees, CDC/DHQP
Kerri Moran, CDC/DHQP
Elizabeth Mothershed, CDC/DHQP
Matt Moncreif, CDC/DHQP
Shannon Novesad, CDC/DHQP
Hanako Osuka, CDC/DHQP

Priti Patel, CDC/DHQP
Kiran Perkins, CDC/DHQP
Joseph Perz, CDC/DHQP
Latasha Powell, CDC/DHQP
Sujan Reddy, CDC/DHQP
Victoria Russo, CDC/DHQP
Christina Sancken, CDC/DHQP
Eileen Scalise, CDC/DHQP
Rachel Slayton, CDC/DHQP
Henrietta Smith, CDC/DHQP
Erin Stone, CDC/DHQP
Rieko Takahashi, CDC/DHQP
Wendy Vance, CDC/DHQP
Todd Weber, CDC/DHQP

Members of the Public

Hilary Babcock, Washington University, St. Louis
Michelle Cantu, National Association of County and City Health Officials
Jonathan Cooper, Orlando Health Central
Christie Davidson, Ethicon
Pam Falk, Northside Hospital
Peter Field, Crystal IS
W. Charles Huskins, Mayo Clinic
Lori Harmon, Society of Critical Care Medicine
Helen Haskell, Patient Advocate
Jean Henderson, InCo and Associates
Eve Humphreys, The Society for Healthcare Epidemiology of America
Kevin Kavanagh, Health Watch USA
Lauren Lilly, Food and Drug Administration
Rosie Lyles, Medline Industries
Clarence Murray III, Food and Drug Administration
Maria Rodriguez, Xenex Disinfection Services
Keith St. John, PDI
Stephanie Henry Wallace, Cambridge Communications
Cindy Winfrey, Pentax Medical

Day 2: May 18, 2018

HICPAC Members

Dr. Daniel Diekema, Co-Chair
Dr. Deborah Yokoe, Co-Chair
Ms. Vickie Brown
Dr. Kristina Bryant
Dr. Vineet Chopra
Dr. Michael Howell
Dr. Lisa Maragakis
Dr. Jan Patterson

***ex officio* Members**

Ms. Elizabeth Claverie-Williams, Food and Drug Administration (FDA)
Dr. David Henderson, National Institutes of Health (NIH) (via teleconference)

Dr. Melissa Miller, Agency for Healthcare Research and Quality (AHRQ)
Dr. Gary Roselle, US Department of Veterans Affairs (VA)
Dr. Daniel Schwartz, Centers for Medicare and Medicaid Services (CMS)
Ms. Judy Trawick, Health Resources and Service Administration (HRSA)

Liaison Representatives

Ms. Elaine Dekker, America's Essential Hospitals (AEH)
Dr. Elizabeth Wick, American College of Surgeons (ACS)
Ms. Sharon Morgan, American Nurses Association (ANA)
Ms. Amber Wood, Association of periOperative Registered Nurses (AORN)
Ms. Silvia Quevedo, Association of Professionals of Infection Control and Epidemiology (APIC)
Ms. Kristen Ehresmann, Association of State and Territorial Health Officials (ASTHO)
Ms. Lisa McGiffert, Consumers Union (CU)
Ms. Dana Nguyen, National Association of County and City Health Officials (NACCHO)
Ms. Kathleen Dunn, Public Health Agency of Canada (PHAC)
Dr. Pamela Smithburger, Society for Critical Care Medicine (SCCM)
Dr. Louise Demby, Society for Healthcare Epidemiology of America (SHEA)
Dr. Robert Sawyer, Surgical Infection Society (SIS)

CDC Representatives

Michael Bell, CDC/DHQP
Shantel Benjamin, CDC/DHQP
Brajendra Singh, CDC/DHQP
Stefanie Bumpus, CDC/DHQP
Denise Cardo, CDC/DHQP
Koo-Whang Chung, CDC/DHQP
Amanda Clemons, CDC/DHQP
Daniella Coker, CDC/DHQP
Kendra Cox, CDC/DHQP
Mahnaz Dasti, CDC/DHQP
Adina de Coteau, CDC/DHQP
Shani Doss, CDC/DHQP
Anthony Fiore, CDC/DHQP
Janet Glowicz, CDC/DHQP
Jeremy Goodman, CDC/DHQP
Taylor Guffey, CDC/DHQP
Demetria Ihenacho, CDC/DHQP
Agasha Katarwa, CDC/DHQP

David Kuhar, CDC/DHQP
Kent Lemoine, CDC/DHQP
Shelly McGill, CDC/DHQP
Kerri Moran, CDC/DHQP
Matt Moncreif, CDC/DHQP
Joseph Perz, CDC/DHQP
Catherine Rebmann, CDC/DHQP
Christina Sancken, CDC/DHQP
Rachel Slayton, CDC/DHQP
Kara Jacobs Slifka, CDC/DHQP
Duane Stone, CDC/MASO
Erin Stone, CDC/DHQP
Rieko Takahashi, CDC/DHQP
Wendy Vance, CDC/DHQP
Katharina van Santen, CDC/DHQP
Ellen Wan, CDC/DHQP
Todd Weber, CDC/DHQP
Lindsey Weiner, CDC/DHQP
Kathryn Wiedeman, CDC/DHQP

Members of the Public

Hilary Babcock, Washington University, St. Louis
Michelle Cantu, National Association of County and City Health Officials
Jonathan Cooper, Orlando Health Central
Christie Davidson, Ethicon
Pam Falk, Northside Hospital
Dr. W. Charles Huskins, Mayo Clinic
Lori Harmon, Society of Critical Care Medicine
Eve Humphreys, The Society for Healthcare Epidemiology of America
Kevin Kavanagh, Health Watch USA
Lauren Lilly, Food and Drug Administration
Rosie Lyles, Medline Industries

Clarence Murray III, Food and Drug Administration
Maria Rodriguez, Xenex Disinfection Services
Stephanie Henry Wallace, Cambridge Communications
Shaheerah Williams, Northside Hospital
Hao-Hsin Wu, Taiwan Centers for Disease Control

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 May 17-18, 2018 in Atlanta, Georgia. The Designated Federal Official (DFO) and co-Chairs confirmed the presence of a quorum of HICPAC voting members and *ex officio* members, which was maintained throughout the meeting.

The meeting was called to order at 9:15 am on May 17, 2018. Dr. Denise Cardo provided updates pertaining to current and potential future activities within DHQP. Dr. Kristina Bryant presented on the Neonatal Intensive Care Unit (NICU) Infection Prevention Guideline Workgroup's evidence summary and draft recommendations for *Staphylococcus aureus* (*S. aureus*) Key Question 3 and updates on progress on *S. aureus* Key Question 1; central line-associated bloodstream infection (CLABSI); and respiratory illness. Dr. David Kuhar presented on the Healthcare Personnel Guideline Workgroup's approach to the variability in how occupational exposures to a pathogen are defined.

Dr. Daniel Pollock provided information on the National Healthcare Safety Network (NHSN) with regard to: 1) errors and NHSN's work to guard against future mishaps; 2) Antimicrobial Use and Resistance (AUR) reporting to NHSN's AUR Module and plans to further develop the Standardized Antimicrobial Administration Ratio (SAAR); 3) NHSN components scheduled for launch; and 4) plans to develop a new healthcare-associated infections (HAI) measure for NHSN, hospital-onset bacteremia (HOB) and fungemia. Dr. Sheri Chernetsky Tejedor addressed considerations as NHSN moves toward electronic measures, including reducing subjectivity, automating event detection, and automating how data are aggregated and reported.

Dr. Deborah Yokoe provided an overview of the NHSN Workgroup and its Data and Definitions Subgroup's work, which included focus on: 1) Catheter-associated urinary tract infection (CAUTI) surveillance definition and the impact of age on the consideration of fever as part of the definition criteria; and 2) *Clostridium difficile* (*C. difficile*) infection testing and risk adjustment. HICPAC voted unanimously to recommend to NHSN the removal of the age specifications in symptomatic urinary tract infection (SUTI) 1a and 1B. Dr. Michael Howell provided an overview of the charge and work to date of the Reports and Communication Subgroup.

Dr. Vineet Chopra presented an update of the Products and Practices Workgroup's progress on the development of an algorithm to guide HICPAC in product review and recommendations. Dr. Snigdha Vallabhaneni presented an update on *Candida auris* (*C. auris*). Liaison representatives and *ex officio* members provided reports, and public comment was provided. HICPAC stood in recess from 5:12 pm on May 17, 2018 until 9:11 am on May 18, 2018.

Dr. Hilary Babcock presented an update on the Healthcare Personnel Guideline Workgroup's work on Section II of the *Guideline for Infection Control in Healthcare Personnel*. She presented draft Mumps and Rubella recommendations and narrative text recommendations. HICPAC voted unanimously to approve the materials as presented. Drs. Lynn Sosa and Robert Belknap presented on updates to "Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Settings, 2005," including key changes in the update. Dr. Anthony Fiore discussed the potential role and impact of vaccines in the prevention of HAIs and in reducing the risk of antimicrobial resistance (AMR). Public comment was provided. HICPAC stood in recess at 11:37 am on May 18, 2018.

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Healthcare Infection Control Practices Advisory Committee (HICPAC)

May 17-18, 2018
Atlanta, Georgia

Minutes of the Meeting

The United States (US) Department of Health and Human Services (HHS) and the Centers for Disease Control and Prevention (CDC) National Center for Emerging and Zoonotic Infectious Diseases (NCEZID) Division of Healthcare Quality Promotion (DHQP) convened a meeting of the Healthcare Infection Control Practices Advisory Committee (HICPAC) on May 17-18, 2018 at the Tom Harkin Global Communications Center at the Centers for Disease Control and Prevention, 1600 Clifton Road NE, Atlanta, Georgia.

Thursday, May 17, 2018

Welcome and Introductions

Deborah Yokoe, MD, MPH
Professor of Clinical Medicine
Medical Director, UCSF Hospital Epidemiology and Infection Control
Department of Medicine, Division of Infectious Diseases
University of California, San Francisco

Dr. Deborah Yokoe called the meeting to order at 9:15 a.m. and welcomed HICPAC members, *ex officio* members, and liaison representatives. She conducted a roll call, establishing that a quorum was present. Quorum was maintained throughout the day. HICPAC members disclosed the following conflicts of interest:

- Dr. Kristina Bryant has been an investigator on multi-center vaccine trials funded by Pfizer.
- Dr. Daniel Diekema has received research funding from bioMérieux.
- Dr. Michael Howell is employed by Google Research and owns equity in Alphabet.
- Dr. Lisa Maragakis receives research funding from Clorox for an ultraviolet (UV) light study and her husband industry support for basic science research in Amyotrophic Lateral Sclerosis therapies.
- Dr. Jan Patterson receives compensation from Young Living Essential Oils and her spouse has been a consultant and conducted research for 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. Denise Cardo updated HICPAC on current activities and potential future activities within

DHQP, as well as several meetings that DHQP has either participated in or convened. The Division continues to maintain the principles of preventing infections and combating antibiotic resistance (AR) in healthcare, focusing on the patient and on activities to prevent infections, improve antibiotic use, and detect and contain emerging threats.

At a previous HICPAC meeting, Dr. Cardo shared a summary of the [progress report](https://www.cdc.gov/hai/surveillance/data-reports/data-summary-assessing-progress.html) (<https://www.cdc.gov/hai/surveillance/data-reports/data-summary-assessing-progress.html>) that DHQP developed for 2006-2016 for infections included in the National Action Plan to Prevent Health Care-Associated Infections: Road Map to Elimination (HAI Action Plan). This report shows trends from data reported to the National Healthcare Safety Network (NHSN), information from the Emerging Infections Program (EIP), and preliminary information from the healthcare-associated infection (HAI) hospital point prevalence surveys comparing 2015 to 2011. Combining, summarizing, and interpreting these data not only helps DHQP think about decreases in HAIs, but also about how to use current knowledge to prevent more infections, and about areas in which new knowledge may be needed to increase prevention.

The summary also has been an important tool for DHQP in prioritizing its work, which incorporates all HAIs but focuses on infections that are not well-prevented. For example, declines in *Clostridium difficile* (*C. difficile*) infection (CDI) rates have reached a plateau for many reasons, and more needs to be done to prevent CDI. After major decreases in rates of hospital-onset methicillin-resistant *Staphylococcus aureus* (MRSA), those rates are also plateauing. It is important to fully understand why declines in rates have plateaued. DHQP is engaging in internal retreats that involve surveillance, prevention, epidemiological research, and laboratories to examine *C. difficile* and MRSA data from CDC and the field to determine how to make an impact on infection prevention. For example, CDC data indicate that applying prevention strategies resulted in a major prevention impact on central line-associated bloodstream infection (CLABSI) rates. Similar impacts are needed for *C. difficile* and MRSA.

DHQP also considers how data are utilized to frame problems and identify opportunities for prevention. NHSN is an important source of data, and DHQP uses several other data sources. For instance, Dr. John Jernigan presented on modeling and economic impact at the November 2017 HICPAC meeting. DHQP is using this methodology to understand transmission dynamics and to make predictions. To that end, DHQP is funding the Modeling Infectious Diseases in Healthcare Network (MInD-Healthcare) in five sites: the University of Utah, RTI International, the University of Iowa, Washington State University, and the Center for Disease Dynamics, Economics, and Policy (CDDEP). These groups are working together and with DHQP under a cooperative agreement to examine transmission dynamics within and between institutions, as well as the impact of interventions. This initiative illustrates how DHQP continues to build data sources and expand upon the ways in which data are assessed in its work with partners for more targeted prevention.

DHQP is working with the Centers for Medicare & Medicaid Services (CMS) on their “Meaningful Measures Initiative.” CMS offered Meaningful Use-related changes in the Fiscal Year (FY) 2018 hospital inpatient prospective payment systems (IPPS) [Proposed Rule](https://s3.amazonaws.com/public-inspection.federalregister.gov/2017-07800.pdf) (<https://s3.amazonaws.com/public-inspection.federalregister.gov/2017-07800.pdf>), which is available for review and comment. CMS launched a major initiative known as “[Patients over Paperwork](https://www.cms.gov/About-CMS/story-page/patients-over-paperwork.html)” (<https://www.cms.gov/About-CMS/story-page/patients-over-paperwork.html>), which seeks to “put patients first” by reviewing and streamlining regulations to reduce unnecessary burden, increase efficiencies, and improve the beneficiary experience, resulting in measures that lead to positive impact in patient outcomes. In order to decrease the burden of data collection, DHQP is assessing NHSN reporting by type of setting and infection site to identify

types of infections that may be infrequent enough that they do not generate a Standardized Infection Ratio (SIR), and for which there may be not be sufficient information available to guide action. The revisions being proposed for the rule should not affect patient care.

To address quality improvement, DHQP is working with several prevention networks for the use of NHSN data to determine which hospitals need help, and which hospitals are having prevention successes that could help others. The definitions can be improved based on the type of information collected and the use of electronic data sources needs to be considered. It is also important to think about proxy measures that may be easier to collect, more reliable, clinically meaningful, and would make an impact. For example, what is the meaning of hospital-onset bacteremia, and should it be considered to replace or complement the CLABSI measure? Reliable data are critical, particularly given the importance of transparency and accountability in this field. New NHSN modules now are based on electronic data sources. For example, hospitals are now reporting to the NHSN Antimicrobial Use and Resistance (AUR) Module electronically. DHQP is considering how this approach can be expanded to increase the amount of reliable data that can ultimately be used for prevention and improvement.

For the Broad Agency Announcement (BAA) in FY '17, DHQP is funding innovative pilot projects with topics such as:

- *Candida auris* (*C. auris*) decolonization and source control
- Evaluation of colonization or infection risk from exposure to environmental sources of AR pathogens
- Investigation of interventions targeting non-physicians to incorporate antibiotic stewardship practices

The solicitation for FY '18 projects was issued in March 2018, and 234 white papers were submitted in response. Of those submissions, 84 were accepted for full proposals. Awards will be made later in 2018. This response illustrates that many in the field are thinking about innovation, and DHQP has opportunities to help move the field forward.

In April 2018, [CDC Vital Signs: Containing Unusual Resistance](https://www.cdc.gov/vitalsigns/containing-unusual-resistance/index.html) (<https://www.cdc.gov/vitalsigns/containing-unusual-resistance/index.html>) was published. It noted the critical concept of containment. In the past, CDC engaged in an investigation and implementation of control measures with a health department or healthcare facility when transmission of a specific pathogen was demonstrated. In past outbreaks, delay in identifying the source case was an important factor leading to transmission, which had often occurred within the healthcare facility and in the region between facilities by the time CDC became involved. In the case of carbapenem-resistant *Enterobacteriaceae* (CRE), for instance, it became clear that colonized patients played an important role as “vectors” for transmission to other healthcare facilities. For this reason, DHQP has been “ahead of transmission,” especially for bacteria with unusual resistance. This goal is one of the reasons for DHQP’s investment in the Antibiotic Resistance Laboratory Network (ARLN or AR Lab Network).

The ARLN is a national network that includes all state public health laboratories and 7 regional laboratories. They work closely with CDC and other public health and clinical laboratories within their states to detect existing and emerging types of antibiotic resistance and deliver rapid response to control it. The *Vital Signs: Containment of Novel Multidrug-Resistant Organisms and Resistance Mechanisms - United States, 2006–2017* presented the result of approximately 220 investigations following approximately 7000 tests for CRE and approximately 4000 tests for carbapenem-resistant *Pseudomonas aeruginosa* (CRPA). Within the ARLN, clinical cultures are sent to state laboratories for testing by polymerase chain reaction (PCR). As soon as a

carbapenemase-producer is detected, the laboratories can do further testing to identify the organism and determine if it is a new or uncommon resistance for the area or facility. The CDC-funded state HAI-AR program then becomes involved and conducts an urgent investigation on site. Social network analysis is performed to determine potentially associated facilities, which can be assessed for transmission. The state HAI-AR program conducts an infection control assessment using DHQP's tools. If transmission is found, patient screening and assessments for infection control continue until transmission is no longer detected. This effort has resulted in the rapid containment of emerging AR threats and has identified skilled nursing facilities (SNFs), especially ventilator skilled nursing facilities (vSNFs), as potential amplifiers of transmission. To have an effective and prompt response, clinical laboratories have to collaborate with the ARLN. With good collaboration, the response and testing of contacts have been accomplished in less than 48 hours. DHQP funds the Society for Healthcare Epidemiology of America (SHEA) public health Fellowship in part to facilitate the public health-healthcare connection, helping hospitals understand the importance of working with public health in identifying isolates. DHQP targets potentially problematic settings in order to drive progress. DHQP also works with the World Health Organization (WHO) to examine international threats. Everyone plays a role in containing and controlling transmission in the US.

Dr. Cardo said a few words about recent meetings in which DHQP was involved. DHQP held the second the Transatlantic Task Force on Antimicrobial Resistance (TATFAR) meeting. TATFAR is comprised of government agencies from Canada, the European Union, and the United States. TATFAR is coordinated by the Office of Global Affairs within HHS, and CDC is engaged in the effort. TATFAR is gaining momentum, with a 3-day meeting convened on March 7-9, 2018, to promote action and discuss ongoing antimicrobial resistance (AMR) work. The meeting was co-chaired by HHS and the European Commission Directorate-General for Health and Food Safety. It allowed for wider participation from AR experts to discuss work in the areas of improving antibiotic use in humans and animals, preventing infections and their spread, and strengthening the drug pipeline. The meeting helped frame the work plan for the second half of TATFAR's implementation period for 2018-2020.

The *International Environmental AMR Forum* was co-hosted by CDC and the United Kingdom (UK) Science and Innovation Network (SIN), in collaboration with the Wellcome Trust, on April 4-5, 2018, in Vancouver, Canada. This meeting focused on the One Health framework, with international experts discussing the impact of antibiotic resistant bacteria and antibiotics in the environment on human health. Topic areas included contamination from human and animal sewage, antimicrobial manufacturing, and antimicrobial use as pesticides. Follow-up will include a scientific report and an executive summary of the meeting. The environment is of increasing importance in terms of resistance; DHQP is funding studies to examine the impact of hospital effluent and contamination of water and water systems.

Dr. Cardo has attended several meetings focused on sepsis. DHQP works not only to prevent infections, but also to promote appropriate management if infections are not prevented and result in sepsis. CDC now has a [Sepsis Surveillance Toolkit](https://www.cdc.gov/sepsis/clinicaltools/index.html) (<https://www.cdc.gov/sepsis/clinicaltools/index.html>) that was developed by the CDC-funded Harvard EpiCenter and is designed for hospitals to use manually or with electronic health records (EHRs). The toolkit is a means to assess the impact of interventions. Further, it is a reliable way to collect information that is not based solely on administrative data.

WHO is also embracing the sepsis initiative. WHO views sepsis in a manner similar to DHQP, in that it should be viewed as part of stewardship and the prevention of infections in the community and healthcare through early assessment and prompt management, rather than as a separate

issue. The Assistant Secretary for Preparedness and Response (ASPR) and the Biomedical Advanced Research and Development Authority (BARDA), which is part of ASPR, have embraced a new initiative known as the “Solving Sepsis Initiative.”

At the United Nations (UN) General Assembly in September 2018, CDC-HHS will launch a year-long campaign to call global stakeholders to action on AMR. Commitments will be solicited to accelerate local and global effort to combat AR resistance. A side event will be dedicated to describing current challenges in the fight against AMR, examining progress that has been made to date, and considering the work needed to make more progress.

Discussion Points

Dr. Yokoe thanked Dr. Cardo for her update, her leadership in this impressive portfolio of activities, and her vision for moving forward.

Regarding the CMS Meaningful Measures Initiative and proposed regulations, Consumers Union (CU) stressed the importance of ensuring public reporting about infections and other medical harm measures. If CMS modifies or eliminates requirements around reporting of hospital-acquired infections, there is concern that there will be a slow erosion of data reported not only for the public, but also for CDC to use, because submission will be on a voluntary basis. Another concern is that the language about “burden” refers to burden on hospitals, paperwork, and CMS. However, the burden on patients and the incredible amount of money that these harms cost the Medicare system must also be taken into consideration. CU is looking into these issues more deeply. In terms of collecting additional data, it is time to think about how electronic data is acquired. Billing data has been pushed aside as unreliable, but with the new International Classification of Diseases (ICD)-10 codes, there may be opportunities for more coding, and consideration should be given to how to make that coding and reporting more accurate. The ability to extract data electronically should result in a major reduction in burden.

Dr. Cardo encouraged reviewing and commenting on the proposed CMS changes. She recalled attending a SHEA event in April 2018, when she was asked about her concerns and what “keeps her awake.” It is tempting, at times, to “take things for granted.” When progress is observed, it may be perceived that certain programs or actions are no longer needed. Much of their progress has been linked to transparency and accountability. These facets of their work are important to consider before moving forward with changes; DHQP is working with CMS to ensure that critical metrics, especially in acute care settings, will be preserved as other entities weigh in on potential changes. These metrics are critical because they are a means to identify unintended consequences and to better address them. Data systems have different purposes, and data from a range of systems must be combined, assessed, and interpreted. Examining electronic data sources is an important direction for the future.

Dr. Yokoe asked how HICPAC might provide input regarding the CMS Meaningful Measures.

Dr. Cardo replied that as an advisory body, HICPAC cannot provide input; however, as individual experts, it is important to read the proposed rules and to submit comments. Ultimately, they are all potential patients. It is therefore important not only to consider what is best for science, but also what is best for us all as patients.

Neonatal Intensive Care Unit (NICU) Guideline Workgroup Update

Kristina Bryant, MD
Chair, NICU Guideline Workgroup

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

Dr. Bryant presented HICPAC with progress made on updating the *Guideline for Infection Prevention in NICU Patients*. She reminded the group of the overall evidence quality categories and the HICPAC Methodology Recommendation Scheme utilized by the Workgroup:

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

Overall strength of Recommendations:

Strength	Definition	Implied Obligation	Language
Recommendation	A Recommendation means that we are confident that the benefits of the recommended approach clearly exceed the harms (or, in the case of a negative recommendation, that the harms clearly exceed the benefits). In general, Recommendations should be supported by high- to moderate-quality evidence. In some circumstances, however, Recommendations may be made based on lesser evidence or even expert opinion when high-quality evidence is impossible to obtain and the anticipated benefits strongly outweigh the harms or when then Recommendation is required by federal law.	A Recommendation implies that healthcare personnel/healthcare facilities “should” implement the recommended approach unless a clear and compelling rationale for an alternative approach is present.	The wording of the Recommendation should specify the setting and population to which the Recommendation applies (e.g., adult patients in intensive care unit settings) <ul style="list-style-type: none"> • Declarative verbs, e.g., use, perform, maintain, replace • Should, should not • Recommend/ is recommended, recommend against/ is not recommended • Is indicated/ is not indicated
Conditional Recommendation	A Conditional Recommendation means that we have determined that the benefits of the recommended approach are likely to exceed the harms (or, in the case of a negative recommendation, that the harms are likely to exceed the benefits). Conditional Recommendations may be supported by either low-, moderate- or high-quality evidence when: <ul style="list-style-type: none"> • there is high-quality evidence, but the benefit/harm balance is not clearly tipped in one direction • the evidence is weak enough to cast doubt on whether the recommendation will consistently lead to benefit • the likelihood of benefit for a specific patient population or clinical situation is extrapolated from 	A Conditional Recommendation implies that healthcare facilities/ personnel “could,” or could “consider” implementing the recommended approach. The degree of appropriateness may vary depending on the benefit vs. harm balance for the specific setting.	The wording of the Conditional Recommendation should specify the setting and population to which the Conditional Recommendation applies when relevant, including: <ul style="list-style-type: none"> – select settings (e.g., during outbreaks) – select environments (e.g., ICUs) – select populations (e.g., neonates, transplant patients) • Consider • Could • May/ may consider

Strength	Definition	Implied Obligation	Language
	<p>relatively high-quality evidence demonstrating impact on other patient populations or in other clinical situations (e.g., evidence obtained during outbreaks used to support probable benefit during endemic periods)</p> <ul style="list-style-type: none"> the impact of the specific intervention is difficult to disentangle from the impact of other simultaneously implemented interventions (e.g., studies evaluating “bundled” practices) there appears to be benefit based on available evidence, but the benefit/harm balance may change with further research benefit is most likely if the intervention is used as a supplemental measure in addition to basic practices 		
No Recommendation	No Recommendation is made when there is both a lack of pertinent evidence and an unclear balance between benefits and harms.	-	“No recommendation can be made regarding”

Each Recommendation will be accompanied by a detailed justification table:

Components	What to include	Comments
Aggregate evidence quality	See below (Table 3)	-
Benefit	List the favorable changes in outcomes that would likely occur if the recommendation were followed.	Be explicit, clear about pros/cons
Risks and harms	List the adverse events or other unfavorable outcomes that may occur if the recommendation were followed.	Be explicit, clear about pros/cons
Benefit-harm assessment	Classify as “preponderance of benefit over harm” (or vice versa) or a “balance of benefit and harm.” Description of this balance can be from the individual patient perspective, the societal perspective, or both.	Recommendations are possible when clear benefit is not offset by important harms or costs (or vice versa); conversely, when the benefit is small or offset by important adverse factors, the balance between benefit and harm prevents a Recommendation.
Resource use	Describe (if applicable) direct costs, opportunity costs, material or human resources requirements, facility needs, etc., that may be associated with following the recommendation.	HICPAC does not perform its own cost analyses and is not obliged to address cost if analyses are not available and no useful statements can be made. State clearly if information on resource use is lacking.
Value judgments	Summarize value judgments used by the group in creating the recommendation; if none were involved, state “none”	Translating evidence into action often involves value judgments, which include guiding principles, ethical considerations, or other beliefs and priorities; stating them clearly helps users understand their influence on interpreting objective evidence.
Intentional vagueness	State reasons for any intentional vagueness in the recommendation; if none was intended, state “none”	Recommendations should be clear and specific, but if the group chooses to be vague, acknowledging their reasoning clearly promotes transparency. Reasons for vagueness may include insufficient evidence; inability to achieve consensus among panel regarding evidence quality, anticipated benefits/harms, or interpretation of evidence; legal considerations; economic reasons; ethical/religious issues.
Exceptions	List situations or circumstances where the recommendation should not be applied	-

Key Question 3 for the *Staphylococcus aureus* (*S. aureus*) section of the Guideline is:
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 Methicillin-Resistant *S. aureus* (MRSA) and Methicillin-Susceptible *S. aureus* (MSSA) or in the setting of an outbreak?

The literature review identified 13 observational studies. Of these, 1 addressed *S. aureus* in general, 10 addressed MRSA, and 2 addressed MSSA. The review also identified 4 descriptive studies, 3 of which addressed MRSA and 1 of which addressed MSSA.

Draft Recommendation III.A.

III.A. Implement multimodal infection prevention and control strategies to prevent *S. aureus* transmission in neonatal intensive care units. These strategies should include infection prevention and control principles including hand hygiene, Standard Precautions, environmental cleaning, and healthcare personnel education, and measuring 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)**

The Workgroup identified 6 studies that implemented multimodal infection prevention and control strategies to reduce *S. aureus* transmission in NICUs. Of those studies, 5 examined MRSA and 1 examined MSSA. The strategies outlined in these studies included a combination of infection prevention and control measures, active surveillance, patient decolonization, environmental measures, and healthcare worker interventions.

Overall, low-quality evidence from 4 observational and 2 descriptive studies suggested a benefit to using multimodal strategies to reduce *S. aureus* transmission in the NICU. There was low-quality evidence of reduction in MRSA infection, with 2 observational studies (Milstone, Haley) reporting a reduction in MRSA infections and 1 descriptive study (Geraci) finding no difference in infections. There was very low-quality evidence of reduction in MRSA colonization, with 3 observational studies (Farrington, Gill, Haley) and 1 descriptive study (Geraci) finding a reduction in MRSA colonization. None of the studies assessed harm.

The earliest observational study was from 1990. All of the observational studies addressed MRSA, with 1 in an outbreak setting and 3 in non-outbreak settings. The observational studies had the following findings:

- Milstone 2010: MRSA, non-outbreak
 - N=60 infections
 - significant reduction in MRSA infection trend
- Gill 2008: MRSA, non-outbreak
 - N=416 infected or colonized infants
 - significant reduction in new MRSA colonization incidence density
 - could be confounded by increased likelihood of pre-contact hand hygiene compliance and a reduction in admissions
- Haley 1995: MRSA, non-outbreak
 - N=76 infected infants
 - significant reduction in MRSA incidence density in combination with an increase in staffing ratios
- Farrington 1990: MRSA, outbreak

- N=50 colonization cases
- significant reduction in MRSA acquisition rate

The descriptive studies had the following findings:

- Geraci 2014: MRSA, non-outbreak
 - N=772 infants
 - no reduction in annual mean of clinical infections
 - significant reduction in weekly colonization pressure in the year following the introduction of the intervention
 - however, an increase was seen between years 2 and 3
 - study period spanned both endemic rates and the introduction of a new MRSA strain
 - these issues were confounded by overcrowding issues
 - no attributable harms analyzed
- O’Connell 2012: MSSA, non-outbreak
 - N=54 infants
 - significant reduction in bacteremia incidence in the last year of study
 - no attributable harms analyzed

The observational studies examined a variety of basic infection control strategies. Therefore, developing a package of interventions based only on these studies could be challenging. All of the studies employed active surveillance. Two of the observational studies implemented some form of infant decolonization. A variety of interventions were utilized in the descriptive studies as well. The O’Connell study added interventions sequentially and then began to observe a difference in the outcome of interest. The descriptive studies employed active surveillance, environmental interventions, and some healthcare worker interventions.

While the outcomes of the studies can be considered as “infection” and “colonization,” the studies did not apply standardized measures or definitions of “infection” and “colonization.” For example, the outcome of interest in the Milstone study was infection trend, and its results showed a reduction in infection trend. The Gill study assessed colonization, and the Haley study assessed infection and colonization. The outcome of interest was an infection rate ratio.

Dr. Bryant emphasized that none of the studies measured the harms or benefits associated with mupirocin or chlorhexidine resistance, length of stay reduction, or attributable mortality.

Two observational and 2 descriptive non-outbreak studies reported reductions following the implementation of a multimodal intervention, which included at a minimum:

- reinforced hand hygiene,
- active screening of patients and healthcare workers for *S. aureus*, and
- decolonizing positive patients and staff.

Two observational studies (Milstone, Haley) and one descriptive study (O’Connell) found a significant reduction in *S. aureus* infections. Two studies additionally implemented patient cohorting for *S. aureus* positive patients (O’Connell, Milstone), and 2 others implemented Contact Precautions and isolation for MRSA positive infants (Milstone, Haley).

The descriptive study (Geraci) found no difference in the annual incidence of clinical MRSA infections over 3 years. That study reported an initial decrease from year 1 to year 2, followed by the introduction of a community strain of MRSA and an increase in infection rates. Additionally, the study reported implementation of basic infection prevention and control practices, such as Contact Precautions and healthcare worker screening and decolonization.

The study period spanned both endemic rates and the introduction of a new MRSA strain. These outcomes were confounded by overcrowding issues.

Regarding colonization, 3 observational studies (1 outbreak (Farrington) and 2 non-outbreak (Gill, Haley)) and 1 descriptive non-outbreak study (Geraci) reported a reduction in MRSA colonization following the implementation of a multimodal infection prevention and control strategy. Gill's non-outbreak observational study reported a reduction in incidence in one of 2 NICUs after implementation of the multimodal intervention; however, this NICU also experienced an almost 50% reduction in admissions during this time. The observational outbreak study (Farrington) implemented interventions in the context of no dedicated equipment, an inability to achieve full compliance with Isolation and Contact Precautions for MRSA, and no cohorting due to staff shortages. One descriptive non-outbreak study (Geraci) reported a significant reduction in mean weekly colonization pressure following the introduction of a policy of universal screening combined with implementation of Contact Precautions and healthcare worker decolonization. However, this reduction was not sustained in the context of a period of overcrowding and the introduction of a new MRSA strain. It is important to note that the quality of evidence was very low, primarily because of a risk of bias.

Very low overall quality evidence suggests that implementing active surveillance, Contact Precautions, and patient cohorting could reduce MRSA colonization. Very low-quality evidence in an observational, non-outbreak study showed no change in MRSA infection (Kaushik, N=3,088). No change was observed in MRSA-related bloodstream infection (BSI), unadjusted length of stay, or MRSA-related mortality using this combination of interventions. However, a descriptive non-outbreak study (Nelson, N=8,837) suggested a significant reduction in MRSA colonization. This evidence is very low-quality based on risk of bias.

Three observational studies analyzed the impact of single-intervention prevention and control measures, but it is important to note that they occurred with a background of a group of interventions to prevent either MRSA or *S. aureus* infection and colonization. In one 2004 study (Ng; N=337), very low-quality evidence found a significant reduction in MRSA septicemia related to implementation of a hand hygiene protocol that used chlorhexidine alcohol hand rub and gloves for routine, non-invasive procedures. A 1996 study (Jernigan; N=331), though again with very low-quality evidence, suggested a reduction in transmission from isolating MRSA-colonized infants. A 2010 study (Song; N=218 colonized or infected infants) implemented PCR for active surveillance testing against a background of other interventions and identified a significant reduction in the MRSA transmission rate. None of these studies assessed harms.

Draft Recommendations – Active Surveillance

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

III.B.1.a. Perform active surveillance testing for MRSA when there is evidence of ongoing healthcare-associated transmission. **(Recommendation)**

Different facilities are likely to apply different definitions of “outbreak” or “increased incidence of infection.” Details about these definitions will be elucidated in the narrative that accompanies the recommendations.

The Workgroup acknowledges that the phrasing of these recommendations is potentially challenging. In particular, the Workgroup seeks feedback about III.B.1.a., as this recommendation could have significant implications for practice. The draft recommendation

specifies MRSA rather than *S. aureus*. How would a facility know that it has ongoing healthcare-associated transmission of *S. aureus* unless surveillance is being conducted – which many facilities do not routinely do, unless there is an outbreak and the facility is conducting surveillance until there is no longer transmission. The Workgroup wanted to avoid making a recommendation for all hospitals to undertake routine screening of all infants for *S. aureus* to determine if they have ongoing healthcare-associated transmission.

This draft recommendation was informed by 12 observational and 4 descriptive studies that implemented active surveillance. Of these, 1 was a *S. aureus* outbreak study, 4 were MRSA outbreak studies, 8 were MRSA non-outbreak studies, and 3 were MSSA non-outbreak studies. Very low-quality evidence suggested a benefit to active surveillance testing to guide prevention and control measures. Nine studies reported reductions in *S. aureus* infections (Milstone, Song, Huang, Morioka, Haley, Delaney, Popoola, Wisgrill, O’Connell), while 2 studies (Kaushik, Geraci) showed no reduction in MRSA infections in outbreak and non-outbreak settings. Four studies reported reductions in MRSA colonization (Geraci, Nelson, Gill, Farrington), and 1 non-outbreak study (Wisgrill) reported no reduction in MSSA colonization. Four observational non-outbreak studies (Pierce, Song, Morioka, Jernigan) reported reductions in MRSA transmission in both outbreak and non-outbreak settings. As a caveat, interventions implemented to prevent transmissions varied across the studies and directly impacted the results.

Draft Recommendations – Frequency of Active Surveillance Testing

III.B.1.b If active surveillance testing is implemented, test at least weekly to promptly identify newly colonized patients and to guide implementation of appropriate infection prevention and control measures. **(Recommendation)**

III.B.2.a. If active surveillance testing is implemented, consider testing out-borne infants and/or infants transferred from other newborn care units on admission to promptly identify newly admitted colonized patients and to guide implementation of appropriate infection prevention and control measures. **(Conditional Recommendation)**

Dr. Bryant pointed out that draft recommendation III.B.2.a. is a Conditional Recommendation because the Workgroup thought that testing is informed by local epidemiology and the context of an individual healthcare facility, such as if a facility is seeing high rates of colonization and knows of a problem with colonized out-borne infants.

Very low-quality evidence from 2 studies found a benefit to implementing admission testing combined with routine screening of all NICU patients for *S. aureus* in outbreak and non-outbreak settings. Of these, 1 observational *S. aureus* non-outbreak study (Delaney, N=66 infants) reported reductions in infections. This study conducted weekly routine screening. An observational non-outbreak MRSA study (Kaushik, N= 3,088 infants) reported no significant reduction in infections. This study conducted routine screening every 2 weeks. A descriptive non-outbreak MRSA study (Nelson, N= 8,837 infants) reported a reduction in colonization. This study conducted weekly routine screening. Very low-quality evidence from 3 studies suggested a benefit to implementing admission testing of outborn infants in conjunction with weekly screening of all infants for *S. aureus* in non-outbreak settings. Two non-outbreak observational studies (MRSA: Milstone, N= 60 with *S. aureus* infection; MSSA: Popoola, N=1,524 neonates) reported reductions in MSSA and MRSA infections. A non-outbreak descriptive study (Pierce, N=4296 patients) reported a reduction in MRSA transmission risk. Again, interventions implemented to prevent *S. aureus* transmission varied across studies. No study implemented active surveillance alone; there was a rich background of other interventions.

The literature search did not retrieve any studies that directly compared different frequencies of active surveillance testing. Is every week the right frequency? Is every 2 weeks? What if a site screens once a week for 3 weeks and then stops? There is no directly comparative data to inform these questions. Low-quality evidence from 2 studies suggests a benefit to weekly routine MRSA screening in outbreak and non-outbreak settings. One observational outbreak study (Jernigan, N= 331 patients) reported a reduction in MRSA infection, and 1 descriptive non-outbreak study (Geraci, N=722 patients) reported no significant reduction in MRSA infection. Very low-quality evidence from 1 study suggested a benefit to routine MSSA screening in very low birthweight infants in non-outbreak settings. One non-outbreak study (Wisgrill, N= 1056 patients) reported a reduction in MSSA infection, but no reduction in MSSA colonization, associated with weekly screening of very low birth weight infants (VLBWI). Interventions in this study were targeted at infants with IVs. Very low-quality evidence from 1 small study (O'Connell, N= 54) suggested benefit to a single MSSA screening in all infants in the non-outbreak settings, and they reported a reduction in MSSA bacteremia at the end of the study period.

There was high risk of bias in almost all of the studies on active surveillance testing. The studies employed a diversity of regimens. The outcomes varied and included infection, colonization, and transmission. Most studies are from non-outbreak settings.

To summarize the evidence tables for active surveillance to guide *S. aureus* prevention and control:

- Four observational non-outbreak studies (Milestone, Popoola, Wisgrill, Delaney) and 1 descriptive non-outbreak (O'Connell) study employed active surveillance to guide implementation of infection prevention and control measures for *S. aureus* and reported reductions in infections.
- One observational non-outbreak study (Kaushik) and 1 descriptive non-outbreak study (Geraci) reported no reduction in MRSA while conducting active surveillance to guide implementation of infection prevention and control measures for MRSA.

To summarize colonization findings:

- 2 descriptive non-outbreak studies (Geraci, Nelson) reported reductions in MRSA colonization.
- 1 observational non-outbreak study (Wisgrill) reported no significant reduction in MSSA colonization.
 - Interventions implemented to prevent *S. aureus* transmission varied across studies.
- One observational non-outbreak study (Pierce) and 1 observational outbreak study (Jernigan) reported reductions in MRSA transmission.

To summarize the evidence table for active surveillance frequency:

- For infection:
 - One observational *S. aureus* non-outbreak study (Delaney) implemented admission testing for all patients and routine screening.
 - The screening frequency started at a monthly rate, then increased to every 2 weeks, then increased to weekly screening until the outbreak ended.
 - One observational non-outbreak study (Kaushik) reported no significant reduction in MRSA infections. This study conducted routine screening every two weeks combined with admission screening of all infants.
- For colonization:

- One descriptive non-outbreak study (Nelson) reported reductions in MRSA colonization. This study conducted weekly routine screening combined with admission screening of all infants.

To summarize the evidence table for screening out-borne infants:

- For infection:
 - Two observational non-outbreak studies (Milstone, Popoola) reported reductions in MRSA and MSSA infections while conducting admission screening for out-borne infants combined with weekly routine screening.
- For transmission risk:
 - One observational non-outbreak study (Pierce) reported no reduction in MRSA transmission risk while conducting MRSA admission screening for out-borne infants combined with weekly routine screening.

To summarize the evidence table for routine screening:

- One descriptive non-outbreak study (Geraci) reported no reduction in infection while conducting routine weekly screening of all infants.
- One descriptive non-outbreak study (Geraci) reported a reduction in MRSA colonization while conducting routine weekly MRSA screening of all infants.
- One observational non-outbreak study (Jernigan) reported a reduction in MRSA transmission while conducting weekly MRSA screening of all non-colonized infants.

To summarize the evidence table for routine weekly screening of VLBWI:

- One observational non-outbreak study (Wisgrill) reported a reduction in MSSA infection while conducting weekly routine MSSA screening of VLBWI. This study implemented prevention measures on the targeted population of patients with IVs.
- One observational non-outbreak study (Wisgrill) reported a reduction in MSSA infection while conducting weekly routine MSSA screening of VLBWI. This study implemented prevention measures on the targeted population of patients with IVs.

To summarize the evidence table of single screening:

- One descriptive non-outbreak study (O'Connell) reported a reduction in MSSA infection. This study conducted a single MSSA screening.

Draft Recommendations – Preemptive Contact Precautions

III.B.2.b. If testing on admission is performed, consider implementation of preemptive contact precautions until *S. aureus* colonization is excluded. **(Conditional Recommendation)**

III.B.3. Appropriate procedures to allow discontinuation of Contact Precautions for individual neonatal intensive care unit patients who have a history of colonization or infection with *S. aureus* is an unresolved issue. **(No Recommendation)**

One non-outbreak observational study (Morioka 2013, MRSA non-outbreak, N=1,646) reported a reduction in MRSA infection transmission, and in composite infection and colonization transmission, with very low-quality evidence of benefit. This study noted no difference in length of stay due to the implementation preemptive Contact Precautions. A significant reduction was reported in MRSA transmission with the implementation of preemptive Contact Precautions for up to 72 hours for all out-borne infants while waiting for results from admission surveillance cultures. Results are likely confounded by the concurrent increase in compliance with hand

hygiene.

The Workgroup deliberated whether III.B.2.b. should be a Conditional Recommendation or an Unresolved Issue. A single study with very low-quality evidence could support a Conditional Recommendation, which gives facilities an opportunity, based on their local epidemiology and their own setting, to decide the most appropriate course of action.

Draft Recommendations – Testing Strategy: Assay and Anatomic Sites

III.B.4. If active surveillance testing for *S. aureus* colonization in neonatal intensive care unit patients is performed, use either polymerase chain reaction or culture-based detection methods. **(Recommendation) (See Implementation Considerations).**

III.B.5.a. If active surveillance testing 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)**

III.B.5.b. Consider also collecting samples from the axilla, rectum, and umbilicus to increase yield in neonatal intensive care unit patients. **(Conditional Recommendation)**

These Testing Strategy Draft Recommendations were approved by HICPAC during its public teleconference in February 2018 after discussion at two previous HICPAC meetings.

Draft Recommendations – Decolonization

III.C.1.a. 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 despite the implementation of and adherence to appropriate infection prevention and control measures. **(Conditional Recommendation)**

III.C.1.b. The use of universal decolonization is an unresolved issue in this population. **(No Recommendation/ Unresolved Issue)**

III.C.2. Consider intranasal mupirocin for decolonization in neonatal intensive care unit patients. **(Conditional Recommendation)**

III.C.3 The addition of topical antiseptics, such as chlorhexidine bathing, to intranasal mupirocin is an unresolved issue. **(No recommendation/unresolved issue)**

Regarding Draft Recommendation III.C.1.a, the use of universal decolonization and the addition of topical antiseptics and intranasal mupirocin are unresolved issues in this population. The studies reviewed for these recommendations provided very low-quality evidence of benefit and no harms to implementing active surveillance and targeted decolonization to reduce *S. aureus* transmission, and included the following:

- Huang 2015: (N=525 infants): This MRSA non-outbreak observational study reported a significant reduction in MRSA infection density following implementation of active surveillance and decolonization for MRSA colonized infants using mupirocin applied to the nares and umbilicus, and in conjunction with daily soap bathing for all infants.
 - This study reported no difference in unadjusted median length of stay between groups, and no mupirocin resistance.

- Popoola 2016 (N=1,524 infants): This MSSA non-outbreak observational study reported a reduction in MSSA infection incidence following implementation of active surveillance and decolonization with nasal mupirocin and topical chlorhexidine disinfection for MSSA-colonized infants.
 - This study reported no difference in the unadjusted mean length of stay.
- Pierce 2016 (N=4,296 infants): This MRSA non-outbreak descriptive study reported increasing exposure to treated, isolated neonates not significantly associated with increased transmission risk.
 - However, increasing exposure to untreated, isolated neonates was significantly associated with increased transmission risk.
 - MRSA-colonized neonates were decolonized with intranasal mupirocin and topical chlorhexidine gluconate wash, and isolated and put on Contact Precautions.
- Wisgrill 2017 (N=1,056 infants): This MSSA non-outbreak observational study reported a significant decrease in MSSA-attributable infections following the implementation of active surveillance of VLBWI and targeted decolonization of colonized infants with IVs.
 - Infants were decolonized with intranasal mupirocin and topical octenidine wash.
 - No adverse events were associated with this decolonization protocol.

The literature search did not retrieve any studies directly comparing different decolonization strategies. Intranasal mupirocin was utilized to decolonize MRSA- and MSSA-colonized neonates in all 4 of the studies examining targeted decolonization. There was very low quality of evidence of benefit and no harms from these 4 studies reporting reductions in MRSA and MSSA infection and in MRSA transmission risk. Topical disinfectants were not uniform across the 4 studies and included chlorhexidine gluconate impregnated cloths, octenidine solution, and mupirocin. Focusing on the decolonization regimens, the common link is intranasal mupirocin.

The Workgroup will continue to review and evaluate the evidence, refine the draft recommendations, and develop the justification tables. Work is also progressing on Key Question 1:

***S. aureus* Key Question 1**

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

1.2 What are the risk factors for endemic MRSA colonization in NICU patients? Do these factors differ in the setting of an outbreak?

1.3 What are the risk factors for endemic MSSA colonization in NICU patients? Do these factors differ in the setting of an outbreak?

Work is progressing on CLABSI, which has a single key question:

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

The literature search has been updated. The title and abstract review of the 643 references yielded by the literature search is complete, and 415 studies have been selected for full text review. The next steps are to update the literature search, begin the systematic literature review, and present progress at the next HICPAC meeting.

The final section of the NICU guideline pertains to respiratory illness. The next steps for this

topic are to complete the scoping literature search update that is in progress, review key questions, define interventions and outcomes of interest, update the initial extraction tables to comply with current exclusionary criteria, and start the literature search.

Discussion Points

Draft Recommendation III.A.

This work initially focused on MRSA. However, in reviewing the epidemiology of *S. aureus* infection in the NICU, it became clear that MSSA is a major burden as well. At the direction of HICPAC, the Workgroup expanded its focus to include both MRSA and MSSA. Many of the interventions that are effective for MRSA are also likely to be effective against MSSA.

Dr. Bell acknowledged and expressed appreciation for the great deal of work required to add the rest of *Staphylococcus* to the scope of work for this guideline. HICPAC agreed and appreciated the effort to describe the disparate studies clearly.

HICPAC observed that the issue of healthcare worker screening may overlap with the Healthcare Personnel Guideline that is under development. HICPAC asked about the context of the healthcare worker screening and whether it was limited to MRSA only, during the outbreak, the outbreak versus the non-outbreak studies, or included in all of the studies.

Dr. Bryant replied that the screening varied based on the study. The Milstone study was a non-outbreak situation in which healthcare workers who were positive for MRSA were screened and decolonized. The Haley study was similar. In the O'Connell study, there was a one-time screening of workers and decolonization of MSSA-positive workers in a non-outbreak setting. Because of the overlap with the Healthcare Personnel Guideline, the draft recommendations address healthcare worker education, but not screening, as part of a multimodal intervention.

Dr. Bell suggested defining "multimodal" specifically, noting that in addition to multimodal interventions, particular focus should be given to the inclusion of screening, decolonization, and other successful strategies.

Dr. Bryant agreed, adding that the Workgroup values creating a useful and practical document. In extracting the evidence and using it to make recommendations, the Workgroup observed that nearly every report included a variety of interventions, and teasing out which of the interventions was the most important was challenging.

HICPAC commented that despite the very low-quality evidence and the difficulty in discerning which components of the multimodal strategies were most effective, it is still useful to state which interventions have been successful in combination. The interventions are not controversial; rather, they reinforce "the basics" in infection prevention and control guidelines that should be implemented, including hand hygiene, Isolation Precautions, etc. It is useful to recognize that a "package" of these interventions works, and to highlight the importance of detection and containment.

Dr. Bryant noted that in the draft recommendation, the Workgroup specified the interventions of hand hygiene, Standard Precautions, environmental cleaning, and healthcare worker education, as well as measuring adherence to these strategies as outlined in Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings. This draft recommendation is the starting point for multimodal interventions, but other strategies could be added to the basic practices. Subsequent recommendations provide more specific details, and the narrative will provide additional information.

HICPAC observed that one of the greatest challenges in implementing Contact Precautions in the NICU for patients colonized or infected with MRSA pertains to how to apply the precautions to family members who may stay at the bedside with an infant for hours or days. There was discussion regarding whether the draft recommendations incorporate Contact Precautions not only for healthcare personnel, but also for patients' family members.

Dr. Bryant replied that the question of precautions for family members is clinically important, but sufficient evidence is not available to make a recommendation in this area in a guideline. The Workgroup will acknowledge this issue as a challenge. SHEA is developing a companion document to this Guideline that will address practical questions such as this one that the Guideline cannot address.

Draft Recommendations III.B., III.B.1.a, III.B.1.b, and III.B.2.a

HICPAC commented on the very low quality of the available evidence and the variability in the interventions used in the studies. It appears that active surveillance alone is not as effective in preventing transmission as active surveillance followed by use of that surveillance to implement enhanced prevention strategies. The recommendation regarding active surveillance could be coupled with next steps.

Dr. Huskins, Workgroup member, emphasized the importance of this set of recommendations because they will drive the approach to the first recommendation; that is, if a facility has a better understanding of its MSRA and MSSA epidemiology and transmission patterns, then that information will inform the interventions that the facility implements.

HICPAC raised the issue of the definition of “outbreak” and the variability in the definitions utilized by the observational studies. Even in the absence of a clear outbreak, observational studies are performed and published when there is a high background rate of infection, and perhaps ongoing transmission is obvious. One person may define that scenario as an outbreak, while another might not.

Dr. Bryant agreed and said that the Workgroup discussed this issue. The recommendation cannot necessarily define “outbreak,” but the narrative can suggest potential definitions and considerations.

HICPAC observed that the words “low-quality” and “high risk of bias” may lead to a tendency among readers to dismiss, or not to believe, the results. This evidence evaluation instrument heavily favors randomized designs, but the evidence base for these recommendations is comprised of observational studies. Some of the observational studies are very large, with thousands of subjects. It is therefore important to frame this point clearly in the text so that readers understand that the studies are “very low-quality” with “high risk of bias” not because they are not well-done, but because the evaluation tool grades them in that way. It is also important to remember that the recommendations and summaries are binary; they frame results as reduction or no reduction, for instance. That approach does not represent the actual decrease in transmission rates. The studies are different in their protocols and measures, but it would be helpful to state that “the range of decrease in transmission was from X to Y.” The percent decrease could significantly influence the credibility of the recommendations. Decreases of 30%, 40%, or 50% are powerful even in the context of evidence that is very low-quality, with a high risk of bias.

HICPAC observed that the term “clinically meaningful reductions” may be preferable to providing specific percent decreases because of the small numbers in some of the studies.

Regarding screening, America's Essential Hospitals (AEH) supported focusing on *S. aureus* in general, as much would be "lost" in a focus only on MRSA. Smaller IPC programs and NICUs may not see a great deal of MRSA and MSSA: guidance to help them understand how to identify them would likely be helpful.

Dr. Bell noted that the impact of the interventions will vary depending upon the facility's or unit's "starting point." Implementing interventions in a site with a number of issues is likely to have an impact, where a "pristine" site may not see large impacts when interventions are implemented. He wondered about the possibility of a "pre-recommendation" initiation step for sites to first assess their status, and then implement certain interventions; that is, to link a recommendation to a facility's context rather than presenting a standalone recommendation, which a facility may not need to implement if it is not experiencing problems.

HICPAC recalled an instance in Maryland, when active surveillance was mandated in certain units, but no action was linked to the data from the surveillance. Linking active surveillance to interventions is important. Regarding *S. aureus* versus MRSA only, the data are sufficient to support *S. aureus* in general. Draft Recommendations III.B. and III.B.1.a. may not need to be parsed out. The distinction of having or not having evidence of ongoing healthcare-associated transmission may not be meaningful to readers to distinguish among an outbreak, increased incidence of infection, or ongoing healthcare-associated transmission. This thinking favors focusing on *S. aureus* and perhaps specifying MRSA and MSSA.

Consumers Union wondered why CDC or another entity is not commissioning studies that provide answers to these important questions. Current research does not seem to fit what HICPAC seeks to inform its advice. It would be worthy to study exactly what is needed to inform the entire healthcare system.

Dr. Bryant acknowledged the importance of this issue. Their work is helping to define gaps; for instance, the Workgroup generated a systematic review of *C. difficile* because it was not possible to create recommendations based on the available evidence. This effort could represent a first step in highlighting where the gaps are, and what research questions might need to be answered to inform even better recommendations.

Regarding *S. aureus* in the NICU, AEH emphasized the importance of "stating the obvious" about implementing Standard Precautions. In the past, protocols were in place in NICUs for how to handle visitors, staff, and volunteers. Perhaps this document could address normal practices in a facility with high incidence and make recommendations about implementing precautions, such as using hand sanitizer before entering the NICU and donning a clean cover gown to hold a baby, depending upon the level of risk.

HICPAC asked whether the intent was to remove differences between MSSA and MRSA not only regarding active surveillance testing, but also regarding the management of NICU patients who may be colonized or infected with one or the other.

Dr. Bryant answered that the Workgroup wants to highlight that even with the level of evidence available, there is good support for recommending active surveillance for *S. aureus* in general in an outbreak setting or when an increase in incidence of infection is observed. For example, it makes sense to perform active surveillance testing in the NICU in the context of a cluster of babies with MSSA bacteremia, or an outbreak. The question of ongoing healthcare-associated transmission is less clear: what does that mean, and how do you know it? For example, many NICUs screen routinely for MRSA, but it is less common to screen routinely for MSSA. The Workgroup did not craft a draft recommendation to state that all patients should be screened for

MSSA all the time, “no matter what.” However, they recognize and acknowledge that these recommendations may prompt more facilities to screen for not just MRSA, but for *S. aureus* in general.

There was support among some members of HICPAC for the approach to *S. aureus* in general because of the significant problems that have occurred with MSSA infections in NICUs.

HICPAC supported the phrasing, “active surveillance testing in NICU patients” to avoid giving the impression that the testing should include healthcare personnel, who should only be included if epidemiologically indicated.

HICPAC suggested not specifying the frequency of testing (i.e., “at least weekly”) in the recommendation, but discussing frequency and different strategies in the accompanying narrative text.

Draft Recommendations III.B.2.b and III.B.3.

HICPAC observed that advances in diagnostic testing will have an impact on these draft recommendations. In the past, it took 48 to 72 hours to determine whether an infant was colonized. Soon, a large number of institutions will have point-of-care testing in the NICU such that the determination can be made almost immediately, as soon as within 30 to 60 minutes. If an infant is suspected of carrying a pathogen, the “Precautionary Principle” should be followed, and the infant should be placed in contact isolation until the diagnosis is confirmed.

Given the high risk of unknown colonization at the time of admission, HICPAC was not troubled by the discrepancy between admission testing and weekly surveillance.

HICPAC observed that in adults, there is some signal of evidence of non-infectious harms associated with Contact Precautions. These potential harms may not have been studied in the NICU, or the effect may go in the opposite direction.

Dr. Bryant responded that the potential harms of Contact Precautions were not evaluated in any of the studies.

Draft Recommendations III.C.1.a., III.C.1.b., III.C.2., III.C.3

HICPAC asked whether any of the studies presented data on mupirocin resistance.

Dr. Bryant indicated that all isolates in the 2015 Song study and the 2016 Popoola were mupirocin-susceptible. The Workgroup did not identify any studies that reported significant mupirocin resistance with the decolonization strategies that were employed. The Workgroup decided on targeted decolonization rather than universal decolonization because only one study in the literature review assessed universal decolonization.

AEH asked whether the document would provide context for the use of the word “consider” in the text.

Dr. Bryant replied that the text will define the meaning of “consider” and will provide details regarding what constitutes “ongoing healthcare-associated transmission” and “increased incidence of infection.”

Regarding the language “despite the implementation of and adherence to appropriate infection prevention and control measures,” Dr. Bell observed that the 2016 Pierce study showed that cross-transmission from isolated infants was greater if they were not decolonized. It seemed as

though that paper would suggest that the phrase should state “in addition to” rather than “despite.”

Dr. Bryant agreed and added that in the 2016 Pierce study, increasing exposure to untreated MRSA carriers was associated with a 6% increase in the risk of incident MRSA colonization. She agreed that this study supports decolonizing colonized infants in addition to implementing other measures. Again, this study was conducted against a background of other interventions in this study.

AEH said that the term “in addition” will also lead readers to focus on continuously assessing how they are doing.

HICPAC asked whether any of the studies addressed decontamination failures; that is, infants who were decolonized successfully, but who were recolonized with *S. aureus* during their NICU stay.

Dr. Bryant answered that data on recolonization was not extracted. She recalled that some of the studies addressed infants who developed an infection when they were in the midst of decolonization.

DNVGL Healthcare, Inc. (DNVGL) said that the recommendations were well put together and recognized the amount of work accomplished by the Workgroup. The recommendation regarding the monitoring of basic infection control practices, including hand washing, Standard Precautions, etc., should be stronger. While education is being provided, the “missing link” is monitoring to ensure that the education is followed. Making continuous monitoring a stronger point in the Guideline may result in changes in practice and even more decreases in infection rates.

Dr. Bryant noted that the first recommendation includes “audit recommended practices.” However, she agreed that auditing should be highlighted in the narrative to describe how the results of an audit should be utilized before employing additional interventions.

Dr. Huskins pointed out that some of the recommendations’ nuances could be addressed in the Justification Tables. Dr. Bryant added that the Workgroup looks forward to developing the Tables and sharing them with HICPAC.

Discussion Recap

Dr. Bryant thanked the group for the feedback and emphasized that the analysis of the interventions took place in the context of multimodal strategies. She summarized the main points of the discussion:

- The narrative will address the challenging question of how to determine when ongoing, sustained transmission is occurring.
- The draft Recommendation on pre-emptive Contact Precautions will remain a Conditional Recommendation.
- Active screening should include *S. aureus* in general, as both MRSA and MSSA cause morbidity and mortality in NICU infants.
- Regarding whether strategies differ between MRSA and MSSA, the Workgroup will focus on *S. aureus* rather than solely on MRSA.

Healthcare Personnel Infection Control Exposures

David Kuhar, MD

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National Center for Emerging and Zoonotic Infectious Diseases

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Dr. Kuhar described an issue that the HICPAC Infection Control in Healthcare Personnel Workgroup has been addressing in the course of updating the *Guideline for infection control in healthcare personnel, 1998*.

As the Workgroup updates Section 2 of the Guideline - the individual pathogen sections that provide recommendations for occupational health services regarding infection prevention and control among healthcare personnel - they have noted considerable variability in how occupational exposures to a pathogen can be described. In many cases, there are significant limitations to what is known about what constitutes an exposure for each pathogen. For instance, two examples of exposure definitions for Pertussis are:

From Section 2 (draft) of the update to the *Guideline for infection control in healthcare personnel, 1998*: “Unprotected (e.g., not wearing a facemask), close, face-to-face contact with an infectious source person or contact with their secretions may be considered an exposure to pertussis. 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. Determination of close contacts may be more inclusive in settings where interaction with persons at increased risk for severe pertussis is more likely.”

From the 2018 American Academy of Pediatricians *Red Book*®: “Close contact can be considered as face-to-face exposure within 3 feet of a symptomatic person; direct contact with respiratory, nasal, or oral secretions; or sharing the same confined space in close proximity to an infected person for ≥1 hour.”

Dr. Kuhar pointed out that the two definitions emphasize slightly different aspects of describing an exposure. Both use terms that may be interpreted differently by readers: both definitions refer to “face-to-face,” and the *Red Book* clarifies that “face-to-face” is within 3 feet of a person with symptoms. All readers, however, will not consider “face-to-face” as necessarily being within 3 feet. “Face-to-face” could be used to describe exposures to other pathogens, such as *meningococcus*, but the same distances may not apply.

One of the Workgroup members wondered whether occupational exposures in healthcare settings could be described in a manner similar to the way that transmission-based precautions express patient isolation categories, and the Workgroup began exploring possibilities for standardizing how occupational exposures in healthcare are described. The Workgroup is also considering which aspects of describing exposure can be broadly applied, maintaining consistency from pathogen to pathogen, and which aspects must remain pathogen-specific. The route of an exposure or distance from a source may be easily generalizable, where factors such as which body fluids are infectious, or examples of job activities that might represent an exposure, may be more challenging to generalize across pathogens.

The aim of this endeavor is to develop terms to describe occupational exposures for healthcare personnel that can be consistently applied to the pathogens included in the *Guideline for*

infection control in health care personnel, 1998 update. Dr. Kuhar presented a draft of potential exposure definitions for HICPAC to consider and discuss. The Workgroup identified 7 categories of exposure that focus on the route of exposure and distance from a source.

“Strawman” Proposed Definitions for Occupational Exposures Among Healthcare Personnel (draft)

Exposure	Proposed Definition
Percutaneous Injury Exposure	A percutaneous injury (e.g., needlestick) with inoculation of potentially infectious body fluids that may include blood, tissue, secretions, or others.
Mucous Membrane Contact Exposure	Mucous membrane contact with potentially infectious body fluids that may include blood, tissue, secretions, or others.
Non-Intact Skin Contact Exposure	Contact of exposed skin that is chapped, abraded, afflicted with dermatitis, or otherwise compromised with potentially infectious body fluids that may include blood, tissue, secretions, or others.
Intact Skin Contact Exposure	Unprotected direct contact with an infectious source person or their environment.
Face-to-Face Exposure	Unprotected, close, face-to-face contact with an infectious source person.
Close Proximity Exposure	Unprotected contact within 6 feet of an infectious source person.
Long-Distance Exposure	Unprotected contact with infectious particles suspended in the air at a distance greater than 6 feet from the source.

The Workgroup has discussed whether non-intact and intact skin contact exposures should be separated. Dr. Kuhar noted that the category names were chosen based on proximity and distance. Other possible category names are “Near Proximity” and “Far Proximity.”

Additional, pathogen-specific information will be included in each section, such as:

- Duration of exposure, which is relevant for some pathogens;
- Potentially infectious body fluids, which can differ among pathogens; and
- Examples of exposures, either grouped or individually described.

The balance between generalization and precision is a challenging aspect of this effort. Precision in defining exposures affects how numbers of exposed healthcare personnel are determined, and hence how postexposure prophylaxis (PEP) is administered and work restrictions are applied.

In closing, Dr. Kuhar posed the following questions for HICPAC discussion:

- Is this approach useful?
- What are possible problems with approaching healthcare personnel occupational exposures in this way?
- How might the definitions need to be customized for individual pathogens?

- Are there other ways that occupational exposures might be described and applied broadly?

Discussion Points

HICPAC applauded the Workgroup's effort and commented that the framework could be useful for thinking about exposures, which often generate substantial confusion.

Regarding potential exposures to meningococcal meningitis, HICPAC said that the concrete criteria in *Red Book* - 3 feet or 6 feet - seem appropriate. More specificity regarding distance would likely be beneficial in some scenarios.

Dr. Kuhar clarified that the goal of this effort is clarity and consistency. Specific distances could be added to the *Face-to-Face Exposure* category.

The American College of Occupational and Environmental Medicine (ACOEM) observed that the categories of *Face-to-Face*, *Close Proximity*, and *Far Proximity* essentially refer to circles of 3 feet, 6 feet, and beyond 6 feet.

Dr. Hilary Babcock, Workgroup member, added that the Workgroup is struggling with the nuances within the categories. Additional thought must be given to how this type of structure might work. Their primary goal is to create consistent definitions to use across similar types of exposures. There is some risk inherent in creating a smaller number of categories and then placing specific infections within each category when better distinctions might be needed.

The Council of State and Territorial Epidemiologists (CSTE) suggested that the *Face-to-Face* and *Close Proximity* exposure categories could provide specific examples of activities that would constitute an exposure, such as intubation and direct examination of the mouth, face, or ears for *Face-to-Face*.

AEH asked how these definitions might be used in the rest of the document.

Dr. Kuhar answered that a decision had not been made regarding how to use the definitions. As an example, the Pertussis section could state that "pertussis may be transmitted to healthcare personnel via face-to-face contact with infectious patients or mucous membrane contact with infectious materials." After that, any applicable durations and specific examples would be described.

The Association of periOperative Registered Nurses (AORN) favored additional specificity regarding types of infectious body fluids. An additional type of exposure to consider is the case of an engineering control and exposure to others of a positive pressure room. For example, what should be done about the people in the hallway or area outside an operating room where a procedure is being performed on a patient with tuberculosis (TB) in a positive pressure environment?

HICPAC asked whether the accuracy of distance reporting is known. Dr. Babcock answered that it is not. She has found that a healthcare worker's estimation of distance may be directly related to concern about the organism to which he or she may have been exposed.

The Surgical Infection Society (SIS) asked whether consideration had been given to how important the word "face" is in face-to-face exposure. One is close proximity, while the other is probably interaction with people's respiratory secretions. There could be 2 categories, one

within 3 feet, and the other actual potential exposure to secretions.

NHSN Update

Recent Issues / Future Plans

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Dr. Pollock described several aspects of NHSN's past and future:

- Errors and NHSN's work to guard against future mishaps
- Reporting to NHSN's AUR Module and plans to further develop NHSN's AU summary measure, the Standardized Antimicrobial Administration Ratio (SAAR)
- New NHSN components "in the pipeline," including an outpatient procedure component slated to launch in the summer of 2018 and a neonatal component scheduled for release in 2020
- Plans to develop a new HAI measure for NHSN, hospital-onset bacteremia (HOB) and fungemia.
 - If this measure is utilized, then the HOB category will subsume CLABSI.
 - Much of the exploratory work in this area has been conducted by CDC-funded EpiCenters.

Over an 18-month period beginning in 2016, 5 years after NHSN first began reporting HAI data to CMS, NHSN experienced a string of errors in CLABSI, catheter-associated urinary tract infection (CAUTI), and *C. difficile* laboratory events and surgical site infection (SSI) files submitted to CMS as part of quarterly reporting. These errors represented a setback for NHSN in many ways. Most of the errors were associated with the re-baselining of the SIR and the HAIs that are reported to CMS. The re-baselining utilized 2015 HAI incidence data for new predictive models. A number of mistakes occurred as those datasets were generated when the risk adjustment was produced. Despite quality assurance efforts in a compressed period of time, unbeknownst to NHSN staff, errors were embedded in the data. In recent months, NHSN staff have been recalculating analyses when necessary, producing and validating corrected data files, and making substantial progress in planning changes to address the root causes of the errors.

Restoring confidence in NHSN after these mishaps will take time and marked improvement in performance. CDC has worked closely with CMS on performance improvement, including organizing a joint kaizen event in April 2018 in which NHSN processes were extensively reviewed by staff from both agencies. In the follow-up phase, CDC is interested in identifying ways that CMS analysts can rapidly participate in verification and validation processes. CDC views its colleagues at CMS as "force multipliers." CDC is also developing additional safeguards for its process that will be evaluated and implemented, in partnership with senior HHS staff, as soon as feasible. CDC has placed the highest priority on committing to closing gaps, adding safeguards, and assuring high-quality performance and work products.

Regarding reporting to NHSN's AUR Module, participation in both AU and AR reporting continues to increase. As of May 15, 2018, 818 hospitals had submitted at least 1 month of AU data, and 326 hospitals had submitted at least one month of AR data, to NHSN. These data are

delivered to CDC in a standard electronic message format, either via upload or through the “Direct Protocol,” which is a secure e-mail. The 818 AU-reporting and 326 AR-reporting hospitals typically use a vendor solution to report their data to NHSN. This approach underscores that it is possible for hospitals to leverage existing healthcare data in electronic form for reporting purposes, and to support this work even in the absence of state or federal requirements to do so.

With increased reporting comes new opportunities to update and expand the use of the AU summary measures introduced in the 2015 SAAR. SAAR is an observed predicted measure of AU that resembles the SIR used for HAI data analysis and reporting. CDC plans to use more recent and extensive AU data to update and expand the SAAR, working closely with infectious disease physicians, clinical pharmacists, and other hospital staff whose antimicrobial stewardship programs use NHSN AU data and SAARs. Their expert input and 2017 AU data will be used to update the adult and pediatric SAARs. Plans are in place to use 2019 AU data to add neonatal SAARs as well. CDC’s collaborations in these areas include work with the pediatric antimicrobial stewardship community, the Sharing Antimicrobial Reports for Pediatric Stewardship (SHARPS) Collaborative, and the Vermont Oxford Network (VON), which is a network of NICU practitioners throughout the US and internationally.

New NHSN components will be introduced in the coming months, including the Outpatient Procedure Component in July 2018. It is initially designed for use by ambulatory surgery centers, with a longer-range goal of extending its use to hospital outpatient departments. When the new component “goes live,” the new components will be:

- SSIs
- Same Day Adverse Events, such as patients burns, falls, and wrong-site surgery.

The SSI surveillance requirements are a simplified version of the requirements for reporting SSIs following hospital inpatient/outpatient surgeries. Trauma cases and closure technique are not required fields in the outpatient procedure component. CDC has worked closely with the Ambulatory Surgery Center Quality Collaboration to develop this new component and the measure of breast surgery SSIs, which was endorsed by the National Quality Forum (NQF).

NHSN is also adding the Neonatal Component. The first reportable event will be neonatal late-onset sepsis (LOS) meningitis. CDC co-developed the LOS meningitis protocol with VON and is also developing an LOS meningitis quality measure proposal with VON to submit to NQF for endorsement consideration. An important element of NHSN’s LOS meningitis surveillance is the plan to leverage electronic data sources, principally admission discharge transfer data and microbiologic results data, both for case detection and to populate reports of numerator and denominator data. NHSN will require use of electronic files for submission in a manner similar to AU and AR reporting; there will be no manual data entry.

NHSN looks forward to moving into the arena of electronic surveillance and making full use of data that are already available in electronic form. This direction is not a panacea, as issues and concerns remain regarding the use of electronic data, but NHSN will address those problems over time, build on what is available, and advance the field. The work underway on HOB and fungemia is an example of a project aimed at advancing NHSN’s use of electronic surveillance. NHSN intends to develop case definition criteria and measure specifications for HOB. This effort will take advantage of microbiology results data that are available in electronic form and in admission, discharge, and transfer data, offering an opportunity to focus on implementations that provide algorithmic detection and additional algorithmic use for producing the files that would be delivered electronically to NHSN.

Technology and Informatics

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Dr. Chernetsky Tejedor discussed additional considerations as NHSN moves toward utilizing more electronic measures, including goals to reduce subjectivity, automate event detection when possible, and automate how data are aggregated and reported.

There is a significant amount of subjectivity in current measures, and the clinical community has observed challenges in using secondary data in clinical documentation, such as signs and symptoms or even process measures. Legacy hospital-acquired infections, such as CLABSI and HOB, are being examined for exclusions and to make them as clinically relevant as possible. This work has revealed tremendous complexity and is a major aspect of the data burden discussions. The work also introduces issues with reliability and effective surveillance intensity. The desire to use clinical documentation may persist; researchers will want to harvest data. The current environment lacks robust natural language processing, though there are pockets of success. In choosing between manual retraction and clinician-forced data entry via “check boxes” for signs and symptoms, there may be a balance such that the clinical community can develop useful structured clinical assessments that may lead to system outcome measures. Attempts to harvest meaningful concepts from a myriad of text are made more difficult by what is referred to as “note bloat” in large, expanding charts.

A number of opportunities as well as challenges need to be addressed in strategies to migrate toward electronic measures. Significant issues remain with regard to interoperability as a number of systems are at work, even at the health system level. Data integrity continues to be an important focus. Data quality could be improved at the point of data entry by making improvements to the electronic health record (EHR) user interface. EHR system architectures must adapt to the data models and business rules that are necessary for automated reporting, although they were not necessarily designed for this purpose, but for billing and compliance purposes. It is important to understand that even with vendor-supplied solutions, facilities still face a big “lift” to implement any type of automation. The challenges include data mapping, especially when legacy data are stored in other systems. Additionally, because workflows are always customized, there is variation in how data are captured. In moving away from unstructured clinical documentation and toward relying on discrete, codified data, structural and process issues at the facility level will still be pertinent. The intensity of effort by the clinical, infection prevention, or health system entities could have an impact on case finding. The same issues apply to administrative data, which were called “metrics of convenience” in a recent *New England Journal of Medicine* perspective piece. If quality measurements are tightly aligned with data collection for payment, so-called “metrics of convenience,” or data that are already required, aspects of data collection such as coding intensity and clinical documentation issues can still impact quality, risk adjustment, and case finding for data that are used administratively. The Medicare Advantage Plans have tried to address these issues with a coding intensity adjustment. Advances in laboratory technology, changes in diagnostic practices, and practice variations will continue to impact case findings; it will be important to continue to evolve as technology evolves.

Currently, the National Quality Measures Clearinghouse™ (NQMC) logs 2523 measures for

healthcare delivery and population health. In thinking about strategies and positioning to evolve as technology evolves, the goal remains to create meaningful measures that are meaningful to patients who are under medical care, that inform local improvement activities to set public health priorities, and that support providing transparency to patient consumers. Increasing levels of automation that optimize reliability will contribute to reductions in workload. With reductions in burden, however, there may be accompanying sacrifices of fluidity, some clinical credibility and complete alignment with what makes sense clinically. In order to tie to payment, discriminatory power will be needed for interfacility comparisons. Advances can be anticipated in diagnostics, tools, methods, and standards, and there will be continued evolution in health information technology and improvements in interoperability and standards. Changes in culture and practice patterns can also be expected, so consideration must be given to how to accommodate telemedicine, use of patient-generated health data and patient-reported health outcomes, etc. New structural process measures may be needed to serve as a “balance measure.” For some conditions, tighter alignment between public health surveillance and clinical care efforts may be needed. Great changes have been observed, but it is important to remain mindful of secondary effects, including what happens when changes are made in measurement, and what data are used.

Discussion Points

HICPAC asked about the availability of a SIR even if the expected result is less than 1, and how it might be built into the models. This change could be useful for driving performance improvement at the unit level.

Dr. Pollock replied that NHSN is actively exploring the possibility of lowering the minimum precision criteria for SIR calculations. A potential alternative, which from NHSN’s perspective would be even stronger, is to advance to the adjusted ranking metric (ARM) that uses advanced Bayesian statistical techniques to reliably adjust the SIR without requiring lower minimum precision criteria. This shift could accomplish the goal of including many relatively low volume healthcare facilities that are currently are not able to generate SIRs and are excluded from interfacility comparisons. Advancement to the ARM and elimination of the minimum precision criteria should be conducted in concert with CMS so that the reporting is harmonized. From a statistical perspective, quality measurement reliability adjustment is critical in this area.

Regarding HOB, HICPAC observed that the CLABSI metric may have yielded all that it can yield from an improvement perspective. Facilities are increasingly influenced by the CLABSI penalties to “do the wrong thing for patient care,” such as avoiding central lines or using other types of devices that may not be the best choice for a patient. Is NHSN’s vision that HOB will subsume, or incorporate, CLABSI?

While EMR data are important, HICPAC wondered how EMR vendors are involved in conversations to include it in NHSN. One approach might be to conform to the vendors’ strategy; that is, to use the data that is currently in the datasets. This strategy, however, may be akin to “inserting a round peg into a square hole.”

Dr. Pollock replied that NHSN confers regularly with EHR vendors whose systems support reporting to NHSN. For example, during the June 2018 Association of Professionals of Infection Control and Epidemiology, Inc. (APIC) meeting, NHSN met individually with Epic, Cerner, and niche product infection surveillance system vendors. An ongoing NHSN project focuses on Consolidated Clinical Document Architecture (C-CDA) supplements for infectious disease reporting. These supplements can specify information to include at the time of patient discharge or transfer so that vendor systems will enable details that are relevant to Contact Precautions,

appropriate continuity of antimicrobial treatment, avoiding duplicative work-ups, etc. The C-CDA standard specifies what should be embedded in records of critical transitions, and there is an opportunity to work directly with Epic and Cerner to further specify what belongs in the record of care. While this issue does not pertain directly to NHSN, it is an example of working with vendors to advance the field. HOB can be the “umbrella” with options to drill down on specific underlying conditions. These ideas are associated with similar challenges faced with ventilator-associated events insofar as what a summary statistic actually means, what proportion of events are preventable, how to go about investigating events, etc. These challenges are important, and NHSN will meet them over time and advance the field. Dr. Pollock observed that vendor organizations are generally receptive to collaboration and to NHSN’s message.

Dr. Chernetsky Tejedor agreed that the vendors are engaged. She added that the strategy of working with standards organizations, providing standards for which vendors can aim, and giving them input on the transfer document is important.

Consumers Union asked how to obtain additional information and education about HOB. Many measures are being collected, and most people consider the infection measures to be priority measures. Consumer groups and others who are interested in public reporting want to see more outcome measures. Many measures are not producing the kind of information that is needed.

Dr. Pollock replied that he and others would be happy to speak further with CU about HOB and offered to share documents on the subject. He further reflected on this new era of rapid expansion, when patients are using their mobile devices to communicate with practitioners. This advance presents an opportunity to integrate this new data source not only for clinical evaluation and postoperative management, but also for surveillance. The gap in SSI post-discharge surveillance is an example of an exciting opportunity to grow in an area that needs attention, and will involve working with communities of practice, EMR system vendors, niche product developers, IPs, and others involved in SSI surveillance.

The Agency for Healthcare Research and Quality (AHRQ) expressed gratitude for the comprehensive review of important work, especially in terms of NHSN expanding to incorporate the ATD environment. AHRQ asked about the timeline for expanding the ARM for the AU/AR modules.

Dr. Pollock replied that the current focus is on 9 months of reporting in 2017 with AU data from over 400 hospitals. Additional risk factors can be assessed from the annual survey. Regarding the Neonatal Module, NHSN is adding questions to the annual survey that will help to build predictive models that are appropriate for neonatal AU purposes. The neonatal survey questions are slated to be utilized for the first time in 2019. In the coming months, NHSN hopes to collect patient-level data and make it available for risk adjustment purposes. The process for assembling AU data begins with processing patient-level data through a series of steps that are often summarized as Extract Transform Load (ETL). If a vendor is executing this ETL step using patient-level data, those patient-level data can also be provided so that NHSN can use them for risk adjustment purposes.

NHSN Workgroup Update

Background/Overview: NHSN Workgroup & Data and Definitions Subgroup

Deborah Yokoe, MD, MPH
Co-Chair, HICPAC NHSN Workgroup
Lead, NHSN Workgroup Data and Definitions Subgroup

Dr. Yokoe and Dr. Howell co-chair the NHSN Workgroup. They summarized the Workgroup's deliberations and future directions.

The NHSN Workgroup was created to serve as a platform for providing input to NHSN pertaining to HAI-related surveillance, including subjects such as analytics, choice of data elements, and surveillance definitions and processes. The Workgroup is charged with providing ongoing and ad hoc input and with providing a summary of its discussions at public HICPAC meetings. The Workgroup also addresses:

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

The NHSN Workgroup includes a number of HICPAC members; representatives from CDC, including NHSN leadership and subject matter experts (SMEs); as well as additional individuals with various areas of expertise and representing many stakeholder groups.

At the July 2017 meeting, HICPAC discussed forming this Workgroup and identified topics that it might address. At the November 2017 HICPAC meeting, it was agreed that the Workgroup would be divided into two subgroups, each addressing a different set of issues:

- Data and Definitions Subgroup, led by Dr. Yokoe with additional support from Dr. Anthony Harris
- Reports and Communication Subgroup, led by Drs. Howell and Chopra.

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

The Data and Definitions Subgroup began its work by discussing potential areas of focus. NHSN staff, particularly Kathy Bridson, provided a comprehensive list of issues that have been raised by NHSN users. Further, subgroup participants were surveyed to identify their high-priority issues. The subgroup's initial focus is on two issues:

- CAUTI surveillance definition and the impact of age on whether fever can be considered as part of the surveillance definition criteria; and
- *C. difficile* infection testing and risk adjustment.

Regarding CAUTI and the age consideration for fever, the symptomatic urinary tract infection (SUTI) definition is divided into two categories, SUTI 1a and SUTI 1b.

SUTI 1b are non-catheter-associated, with these criteria:

1. One of the following is true:
 - Patient has/had an indwelling urinary catheter but it has/had not been in place >2 calendar days on the date of event, **OR**
 - Patient did not have a urinary catheter in place on the date of event nor the day before the date of event.
2. Patient has at least **one** of the following signs or symptoms:
 - fever (>38°C) in a patient that is ≤ 65 years of age
 - suprapubic tenderness
 - costovertebral angle pain or tenderness
 - urinary frequency
 - urinary urgency

- dysuria
3. Patient has a urine culture with no more than two species of organisms identified, at least one of which is a bacterium of $\geq 10^5$ CFU/ml. All elements of the SUTI criterion must occur during the infection window period (IWP).

Fever can only be used as a sole criterion in a patient who is ≤ 65 years of age. In a patient who is > 65 years of age, fever alone does not qualify for a SUTI 1b. This criterion has impacts on applying the SUTI 1a definitions.

SUTI 1a are CAUTIs and are required to be reported to NHSN. They are among the outcomes submitted to CMS and have impacts on reimbursement and public reporting. SUTI 1a criteria are:

Patient must meet 1, 2, and 3 below:

1. Patient had an indwelling urinary catheter that had been in place for **> 2 days** on the **date of event** AND was either:
 - Present for any portion of the calendar day on the date of event, **OR**
 - Removed the day before the date of event.
2. Patient has at least **one** of the following signs or symptoms:
 - fever ($> 38.0^\circ\text{C}$): To use fever in a patient > 65 years of age, the indwelling urinary catheter needs to be in place > 2 calendar days on **date of event**.
 - suprapubic tenderness
 - costovertebral angle pain or tenderness
 - urinary urgency
 - urinary frequency
 - dysuria
3. Patient has a urine culture with no more than two species of organisms identified, at least one of which is a bacterium of $\geq 10^5$ CFU/ml. All elements of the SUTI criterion must occur during the IWP.

In the SUTI 1a definition, fever is a criterion for a patient who is > 65 years of age if that patient has had a urinary catheter placed for > 2 calendar days on the day of the infection event.

The NHSN CAUTI lead provided the subgroup with a number of examples of the impact of the age limitation on application of the CAUTI definition.

Example 1

A patient, ≤ 65 years of age, is admitted to the hospital on February 1, has a urinary catheter inserted that day, and has a fever upon admission that continues for several days through February 11.

- The patient's urinary culture is sent on February 5. It comes back positive for $> 100,000$ *Escherichia coli* (*E. coli*).
- Per NHSN surveillance protocol, an IWP is set around that positive urine culture result.
 - The IWP includes the 3 days before and the 3 days after the positive urine culture, so it spans February 2 through February 8.
 - The criteria used to meet the surveillance infection definitions need to fall within that IWP.
- In this case, the patient is ≤ 65 years of age, so fever alone can be used as a criterion for the SUTI 1b definition.
- Because fever first occurs within the IWP on February 2, February 2 is listed as the day of event (DOE) for this infection.

- Because the DOE is during the first 2 days of hospitalization, the infection is categorized as present on admission (POA) and the patient meets the SUTI 1b definition.

Example 2

In another clinical scenario, the patient is 66 years of age.

- The patient is admitted on February 1, has a urinary catheter placed that day, has several days of fever, and has a positive urinary culture on February 5.
 - This scenario has the same IWP as the first example.
- In this case, because the patient is >65 years of age, the SUTI 1b definition is not met because the patient has fever alone as a clinical criterion.
- The SUTI 1a definition is met because fever alone can satisfy the 1a definition for a patient >65 years of age if that patient has had a catheter placed for >2 days.
- The classification is CAUTI and is entered into NHSN as such.

These criteria are somewhat complicated and can be confusing and difficult for IPs to apply, despite NHSN's efforts to provide education. The confusion can lead to variation in application of the definition. NHSN has therefore been considering removing the age restriction.

After thoughtful discussion, the Data and Definitions Subgroup came to consensus to support removal of the age restriction for fever from the SUTI 1a and 1b definitions. The goal is to simplify the definition in order to make it easier to apply consistently across healthcare facilities.

The topic of CDI testing methods and risk adjustment is complex. Concerns have been expressed about the adequacy of risk adjustment to account for different CDI testing methods (toxin enzyme immunoassay (EIA) alone, PCR alone, toxin EIA + glutamate dehydrogenase (GDH) followed by PCR for discrepancies, PCR followed by toxin EIA, etc.) across healthcare facilities. The choice of testing method or methods significantly impacts the performance of these testing algorithms. As an added complication, the results reported to NHSN depend upon the order of testing.

For example, if a hospital uses EIA+GDH followed by PCR, all toxin-positive results are reported to NHSN. A hospital that does the testing in the opposite order – PCR followed by toxin testing – is only required to report the toxin-positive results to NHSN. Taking all of the possible variations into account makes it difficult to risk-adjust adequately. NHSN recently revised the CDI risk adjustment model, but concerns remain that it may be inadequate to allow for meaningful comparison of CDI outcomes across hospitals. As Dr. Diekema and his group have studied this issue, Dr. Yokoe invited him to share his observations.

Dr. Diekema said that this issue is an example of the complexities described by Drs. Pollock and Chernetsky Tejedor regarding how to account for advances in diagnostic technology as well as variations in diagnostic practices. When pressure is placed on any measure, Goodhart's Law predicts that the resulting changes may lead to a decrease in the measure's value as more pressure is applied. As hospitals continue in their quest to push infection rates to an irreducible minimum, they look to the laboratory as a means to achieve further reductions. In some cases, those approaches may be appropriate (e.g., reducing the number of urine cultures that are obtained). In other ways, they can be detrimental to patient care, such as when a hospital decreases its diagnostic intensity or increases empiric therapy without testing for certain conditions in order to avoid identifying HAIs.

In light of these challenges, Dr. Diekema and his colleagues reviewed a year of their own *C. difficile* diagnostic data to examine what their SIR would be using just toxin EIA testing versus

the most sensitive nucleic acid amplification test (NAAT) testing.¹ In the pre-2015 re-baselining period, using NAAT almost doubled the SIR, even with the risk adjustment formula (EIA 0.50; NAAT 0.95). Clearly, risk adjustment by test method did not seem to work well for their center. When they re-analyzed the data following the re-baselining and the change in the risk adjustment formula, there was some improvement, but still a substantial difference between the SIR under an EIA assumption versus a NAAT assumption (EIA 0.61, NAAT 0.89). To complicate this issue further, a single risk adjustment coefficient will not work for every center because the rate of NAAT-positive/EAI-negative results varies dramatically from center to center and region to region, probably due to different diagnostic testing thresholds and potentially different circulating strains of *C. difficile*.

In 2018, changes were introduced so that the last test result entered into the medical record is used to determine whether the definition for a laboratory identification (LabID) event is met. Some laboratories are now changing their diagnostic algorithm so that the EIA is performed last, or even if it is not performed last, that it is entered last into the medical record in order to reap the benefit of a lower LabID event of CDI and a lower SIR. Optimal patient care and outcomes should drive laboratory practice, not metrics. Some of these issues may be unavoidable, but any approaches to address them will be helpful. The interplay between the laboratory and infection prevention programs is probably greatest for CAUTI and CDI LabID event typing.

In a letter to the editor, Dr. Diekema and his co-investigators recommended:

1. consideration of further changes in risk adjustment by laboratory method to account for the greater sensitivity of PCR; and
2. consideration of allowing any center that uses toxin EIA in an algorithm in combination with a more sensitive test to have the option of reporting under the toxin EIA assumption.

Dr. Yokoe invited Dr. Clifford McDonald, DHQP Associate Director for Science, to discuss a study of the distribution of the increases in the number of cases detected by NAAT.

Dr. McDonald explained that DHQP was approached by the Infectious Diseases Society of America (IDSA) regarding CDI testing when the Marra paper¹ was published in the summer of 2016. At that point, they were in the midst of re-baselining and developing new models. They decided to pause to see how the new model performed, and they began looking at their other data sources to understand the influence of diagnostic testing practices in a measure. HICPAC has heard presentations at previous meetings regarding the Division's movement toward diagnostic stewardship, including examining questions regarding where to measure in the clinical care pathways in order to improve diagnostic practices.

Dr. McDonald is trained in clinical microbiology and has long felt that pre-analytic factors loom large in diagnostic accuracy, and probably even in patient outcomes. The interaction between infection prevention and the laboratory is important, particularly regarding CAUTI and *C. difficile*. It is important to examine whether diagnostics are being used appropriately because they drive antibiotic prescribing. The recent IDSA [CDI guideline](https://academic.oup.com/cid/article-abstract/66/7/e1/4855916?redirectedFrom=PDF) (<https://academic.oup.com/cid/article-abstract/66/7/e1/4855916?redirectedFrom=PDF>) reconsiders the way diagnostics are being used. However, the concept of diagnostic stewardship is inferred rather than mentioned

¹ Marra AR, et al. Impact of 2018 changes in National Healthcare Safety Network Surveillance for *Clostridium difficile* laboratory-identified event reporting. *Infect Control Hosp Epidemiol* 2018 (available online)

explicitly.

The 23 EIP laboratories that assessed the distribution of increases in the number of cases detected by NAAT used algorithms much like those used at Dr. Diekema's facility. Using the algorithms, it is possible to infer what would occur using just NAAT versus just EIA in that sample. Dr. Diekema's pre-2015 data jumped from 88 hospital-onset cases to 247 hospital-onset cases, representing a 250% increase.

The community-onset data in Dr. Diekema's study suggest an increase of approximately 100%, illustrating that the change in detection of NAAT over EIA is observed not only between hospitals, but also in relation to community-onset versus hospital-onset infection. This finding is likely linked to the age of the population being tested, the prevalence of colonization, and diagnostic stewardship. It remains to be determined whether diagnostic stewardship should be pursued, or whether efforts should move in a different direction. DHQP has discussed other possibilities, such as obtaining all results from laboratories. If laboratories report only their EIA results, there will be a major shift in the population, which could have its own unintended consequences. DHQP is considering these issues and hopes to do what Dr. Diekema did at his facility with these 23-plus hospitals, perhaps showing that in some cases, adjusting and reporting the NAAT looks better. These data suggest a distribution of results and that, unfortunately, a hospital could "wind up on the wrong side of that distribution." It is important to understand the issues.

In conclusion, Dr. Yokoe posed the following questions from the Data and Definitions Subgroup for HICPAC discussion and feedback:

- Do you support removing the age-related limitations for considering fever from the SUTI definitions?
- Is it useful to continue CDI testing method risk adjustment discussions? If so, what are HICPAC's suggestions about ways to move the discussion forward?
- In terms of ideas for possible future long-term topics:
 - Would the benefits of collecting patient-level data for better risk adjustment outweigh logistical challenges?
 - Are there specific opportunities to reshape/refocus HAI surveillance targets to enhance the ability of the HAI measures to drive improvements?

Discussion Points

Dr. Anthony Harris emphasized that the study Dr. McDonald is attempting to replicate in 23 hospitals is critical. This work is appreciated by the Data and Definitions Subgroup. He asked whether some of the sites could perform multiple testing, which could lead to an ideal parameter that should statistically result in at least an SIR of 1, regardless of the method being assessed. The goal of parameter adjustment is to have the same SIR no matter the testing method.

Dr. Pollock said that the suggestion is interesting, although logistically difficult for clinical laboratories to carry out.

Dr. McDonald added that the algorithm replicates "split testing," to some extent. If each sample were split, and just NAAT testing and just EIA testing were performed, the results would be similar to the inferred result from the algorithm. A literature search was conducted and over 20 studies were assessed to examine the comparative sensitivity in NAAT versus EIA. When a sensitivity test is conducted for an analytic project for a laboratory test, the specimens are chosen to include 50 positives and 50 negatives, and sensitivity and specificity are compared

that way. The prevalence of true disease must be accounted for when looking at a population. The step-up is not quite the same as trying to determine the comparative sensitivity to a gold standard, or even to one another, as it is considering differential detection in different populations. Strain type is a major factor. The NAP1/027 strain is approximately twice as likely to be EIA positive as non-027 strains. Therefore, the more 027 present, the smaller the difference or 'step-up' from the number that are EIA positive to the number of EIA or NAAT (only) positives combined.

Dr. Pollock commented on diagnostic stewardship. The extent to which moving the step-up downward with diagnostic stewardship disproportionately reduces the number of toxin gene positives by PCR test related to EIA is not clear in the data. HAI detection should drive appropriate diagnostic stewardship, not inappropriate practices that lead to missed and under-diagnoses. As diagnostic interventions are implemented and studies are conducted, it will be important to follow the population in whom testing was averted to assess any subsequent adverse events related to a diagnostic approach that is too aggressive. He welcomed opinions on the genesis of the last test entered into the record being the driver of the event, which could mean that one hospital could have a positive PCR/negative EIA result constituting an event that would not be an event at another hospital.

When the US Department of Veterans Affairs (VA) hears from their facilities throughout the country that their numbers are high, they wonder why, and what they are not doing right. Facilities are testing people because they are afraid not to, and positive laboratory results are received. Working with the laboratories, staff, and attendings, facilities have begun to decrease testing of patients who probably should not be tested.

Dr. McDonald said that the topic of too little testing vs. too much testing represents a good area for optimizing patient outcomes. High testing rates for CAUTI and *C. difficile* drive antibiotic use. Data suggest that antibiotic use may be an independent risk factor for *C. difficile*, and maybe even for sepsis and other untoward outcomes. Consideration must be given to the right amount of antibiotics in the population in order to optimize outcomes. In the interim, there is a "pendulum swing back" for *C. difficile* diagnostics. More sensitive diagnoses were encouraged after the rise of the 027 strain, and it was likely that there were quality control problems in the late 2000s. Then industry developed NAATs, the first of which was approved in 2008, and testing has only increased with the rise of multiplex assays. Diagnostic stewardship is a critical consideration.

Regarding the Data and Definitions Subgroup's future plans, Dr. Harris applauded the work of Drs. Pollock and Chernetsky Tejedor to utilize more electronic data. There is a potential solution with risk adjustment. Hospitals are already reporting and sending their ICD-10 data to CMS for Medicare patients, and ICD-10 data in general has tremendous potential to better risk adjust multiple HAIs. SIRs for CLABSI and SSI are affected when ICD-10 data are used to properly adjust for comorbid conditions. SIRs will appear worse in hospitals that see patients with multiple comorbid conditions. He urged the group to consider assessing the feasibility of moving ICD-10 data collection forward versus pursuing patient-level adjustment by asking IPs to collect more data on the annual survey. The annual survey is an intermediate approach, but it should only be used while moving "full speed ahead" to use ICD-10 data for better risk adjustment.

Dr. Pollock replied that NHSN is considering these possibilities, but many logistical aspects related to the use of ICD-10 data must be acknowledged. Even if it is demonstrated in a single facility, or multiple facilities, that ICD-10 data can be culled for a research project, this approach is not necessarily generalizable. Hospitals produce claims data and submit them to Medicare for

covered patients, and similar bills are issued to other insurance companies. Data collection in this area would require culling from a variety of different companies, or the hospital creating another unit to pull from the claims data they submitted, package those data, and submit them to NHSN in time for NHSN to use them for risk adjustment purposes. They then must determine the process and timing of producing the summary statistics if the billing data from which the coded discharge information for comorbidity and risk adjustment are not readily available. There are likely to be richer and more credible clinical sources from which to cull comorbidity data than can be culled from billing-influenced discharge diagnoses.

HICPAC observed that several departments of health or states have all-payer claims or databases to which all hospitals submit data.

From the California perspective, AEH said that when reports are prepared using those claims data as compared to the NHSN data, they may be similar, but they are not identical. Frequently, numbers are higher when coded billing data are used. Some of the differences may be related to how coders code and are taught to review charts. For example, some teaching facilities train and require coders to include codes entered into a chart as “possible.” Yet, many chart notes are never closed out to reflect whether the “possible” was subsequently ruled in or out.

Dr. Yokoe clarified that Dr. Harris was asking about using administrative data to identify comorbidities that could be used for risk adjustment, a slightly different use of those data.

Dr. Chernetsky Tejedor stressed the issue of coding intensity in using administrative data. Studies show that resource-poor facilities are not staffed to code and capture data in the same way as more affluent clinical settings. In some facilities, a team works in real time to review documentation, with concurrent documentation improvement to improve chart capture. Medicare managed plans are determining how to account for coding intensity, and the payers will follow, but will use their own methods.

AEH pointed out that one issue with using coded administrative data without the resources for real-time work is that the data can be outdated a few months after something occurs, before it was co-classified for comorbid conditions. This discrepancy does not offer the timeliness needed for performance improvement.

Background/Overview: Reports and Communication Subgroup

Michael Howell, MD, MPH

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

Co-Leads, HICPAC NHSN Workgroup Reports and Communication Subgroup

Dr. Howell described the Reports and Communication Subgroup and its topics of focus.

The goal of NHSN is to improve patients’ care. A series of steps must occur before that goal can be achieved, including defining an HAI, collecting data at the facility level, classifying data at the facility level, transmitting the data, and risk-adjusting the data. There can be issues with each of those steps, which occur in series. Even in a world where the definitions, collections, and risk adjustment are perfect, the report that is generated must be used by the facility or a governmental agency. Reports are also used by non-governmental agencies and others like CU, Leapfrog, and hospital associations.

The Reports and Communication Subgroup views itself as “force multipliers,” with two areas of focus:

- Usability of Reports:
 - Improve the interpretability of reports and metrics for IPs, other hospital-based quality leaders, public health, and consumers
- Communication and enhancing the “force multiplier” effect:
 - Explore strategies to facilitate use of surveillance data into actionable steps
 - Improve integration into the HAI prevention work of consumer advocacy groups

Two papers in the literature highlight the importance of the first bullet. The first paper was published in the *Journal of Hospital Medicine (JHM)* in 2017 and assessed whether usual care providers can understand NHSN reports. This study had an enrollment mechanism involving Twitter and included 97 providers, approximately half of whom were MDs. Of these, 60% were pulmonary and critical care doctors, 20% were hospitalists or general medicine doctors, and 40% were part of their hospital’s quality committee. They completed an 11-item survey asking them to interpret information about CLABSI and whether Hospital A or B was better, etc. Participants interpreted information correctly 61% of the time, or 43% of the time if risk adjustment was involved: it is notable that even if the definitions, data, and risk adjustment are perfect, half of the value would be lost in any risk-adjusted report.

A study was published earlier in 2018 in *Infection Control and Hospital Epidemiology (ICHE)* involving 67 participants from the SHEA Research Network, 80% of whom were MDs. They were given a 10-item CLABSI survey. This group interpreted information correctly more often at 75% of the time, and 65% of the time if risk adjustment was involved; however, it should be noted that among this group of experts, interpretation of risk-adjusted data was still incorrect one-third of the time. It has been shown repeatedly in information presentation that experts can be confused with complicated display, which points out the benefit for human health that could be achieved by focusing on the usability of reports.

The Reports and Communication Subgroup recognized that additional voices were needed to contribute to their discussions. Additional Subgroup members were recruited from other entities that use NHSN data, such as professional societies, consumer and healthcare-facing groups, community-facing organizations, hospital associations, hospitals, quality organizations, and those who focus on quality data at the facility level to integrate NHSN data into an overall organizational approach. Roundtable discussions were convened in which participants were asked how they use NHSN data and how it could be more beneficial to them. These discussions identified the themes of understandability, ease of use, timeliness, and data quality, among others.

Dr. Chopra added that the Reports and Communication Subgroup hopes to have a broad view from a number of stakeholders who use NHSN data regularly and to understand their challenges and barriers. A number of meetings were convened by telephone, and each member of the subgroup was asked to provide a brief response to two prompts:

- How do you (or your organization) use NHSN data?
- How could you (or your organization) use NHSN data to achieve higher impact?

It was eye-opening to hear the challenges and how the data are being used. It was clear that the Subgroup could not address every HAI and consider how every report could be improved. Instead, Subgroup members were asked to focus on an important archetype or exemplar as a way to troubleshoot and diagnose issues in order to develop a sense of aspects of NHSN that could improve and that are likely to span across HAIs.

Subgroup participants were asked to rank which of the following NHSN measures should be

focused on first:

- CAUTI
- CLABSI
- LAB-ID Events: CDI and MRSA BSI
- Healthcare worker influenza vaccination status
- BSI infections in dialysis patients

Following the vote, the topic that rose to the top as the most important was *LabID Events: CDI and MRSA BSI*. With that in mind, the Reports and Communication Subgroup is focusing its conversations on LabID Events with the goal of developing a series of observations that they will apply to other HAIs as well.

Discussion Points

Dr. Cardo thanked the group for the thoughtful work, which will be helpful for DHQP in improving existing reports and informing those under development, such as the Patient Safety Atlas.

Dr. Bell asked for examples of themes that arose among the 60% of misunderstood items in the study.

Dr. Chopra replied that misunderstanding does not seem to occur in terms of what the numbers mean, but rather in terms of how to take action on them; that is, comprehension seems fairly stable, but interpretation does not. The literature is deep beyond the area of HAI metrics. Informed consent for patients can be an issue, for instance. A patient may not understand what a 10% chance of an outcome of a procedure means if they are simply told about it, but if they are shown the same data with a graphic icon or a visual tool, the consent response changes dramatically. This issue is likely not different for physicians. The study findings were consistent across a group of clinicians who were less conversant with the data, and a group of experts.

Dr. Chopra was surprised to learn how many different people look at NHSN data, for different reasons and in different ways. For example, a consumer-facing organization looks at the data as a measure of the quality of a hospital, and they struggle with what the numbers mean in terms of quality and whether they should tell their consumers to go there or not. They are trying to make subjective, yet important, decisions with metrics that are not designed to answer what they are looking for. There is a gap between the data and the conclusions that can be drawn from them. He was further surprised to learn how people struggle with using the data, including seasoned IPs who not only submit these data to NHSN, but also read the reports. They often struggle with what an SIR of a given infection means, given that they had 1 infection in a ward that typically does not have them, and suddenly the SIR is “sky high.” The theme is preventability, which raises a number of questions: Can anything be done about it? Can the data be used in a way that is proactive? How does that number link to that process in a way that is real? Another theme among the Subgroup is a strong sense that the data are being used for the wrong things. There is concern that given all of the challenges associated with understanding the metrics, applying data to quality improvement while facing potential repercussions turns people away from the data.

Dr. Howell observed that people use NHSN data and are passionate about NHSN. The Subgroup has seen consistently strong attendance and enthusiasm. Two themes he has heard about the ability to use the data to improve health from all segments pertain to the complexity of the reports, and mechanical issues of getting data in and out of the system. They heard from some organizations that support multiple full-time employees just to help facilities in these

areas.

Dr. Chopra described an example of an organization using the data to predict their status in 3 months or 6 months based on a change being implemented now. NHSN data are not designed to be used in this fashion, given reliability and precision issues. Yet, changes are being made and resources are being allocated based on that monthly report or in-hand data.

HICPAC suggested that the biggest impact they could have with these data is with individual units and individual groups of frontline providers. It will be beneficial to think about how to handle small numbers of events at the unit or facility level, such as central line usage, for which an SIR cannot be calculated. This challenge has driven some facilities to “work backwards” and away from the number of expected infections to review a year’s worth of data to say, “In your scenario you’re only allowed to have 1 infection, and any more than that will be exceeding your target.” Data on the numbers of infections is meaningful to frontline providers and teams to help them assess their basic practices.

Dr. Cardo encouraged use of the Targeted Assessment for Prevention (TAP), not SIRs alone. In talking with the Quality Improvement Organizations (QIOs) and Hospital Improvement Innovation Networks (HIINs), which deal with several facilities, the HIINs are now seeing that facilities that combine SIR and TAP are doing better and can be mentors for others.

Dr. Diekema commented that the LabID Events are the most objective of the metrics. As they heard from Drs. Pollock and Chernetsky Tejedor, the movement toward fully automated objective measures carries the risk of movement away from clinical relevance. Regarding unit engagement, he is concerned about communication challenges associated with a purely objective, fully automated measure in order to make it clinically relevant for frontline healthcare workers and patients and to link it to something that is understood as an important clinical problem.

Dr. Howell noted that Dr. Marion Kainer of the Tennessee Department of Health is a member of the NHSN Workgroup. She has shared her surprise that at the facility level, the electronic measures in some cases validated more poorly than the manually-collected measures due to extraction issues. The Data and Definitions Subgroup is addressing this issue. Subgroup members were interested in CLABSI as well as LabID. The thematic issues to be tackled with each are potentially different. For example, if CLABSI is addressed first, there would be issues associated with dealing with small numbers. Other challenging issues are related to definitions, which have reporting implications.

Dr. Chopra envisioned a visually intuitive report that is generated by objective data, such as a meter that tells people where they are, and where they should be. That report could be linked to a facility’s current state based on the Infection Control Assessment and Response (ICAR), TAP, or other available reports, and help a facility systematically determine next steps. This approach would allow the linkage of objective data to what facilities are reporting, drilling down to determine whether conclusions true across units, and identifying gaps in terms of making the data more actionable. He agreed that the live experience and attribution issues are important, but ultimately, they need to be able to give people something that helps them know what to do next.

HICPAC suggested a type of display of the date over time so that the report is not just a point prevalence and looking from month-to-month, where it could just be common cause variation versus special cause. Dashboards are useful for a monthly picture rather than an overall trend.

Regarding objectivity, HICPAC asked about changing from a CAUTI measure to device utilization and to considering urinary catheters, the biggest risk factor for CAUTIs. Some subjectivity and diagnostic stewardship problems exist with the definition.

Dr. Pollock responded that NHSN's focus with regard to device utilization has been not on changing from CAUTI, but adding to CAUTI.

Dr. Bell wondered whether simple numerator data might play a more important role in the future. Regarding the point about actionable, unit-level information in real time, perhaps a small, parallel branch of simple incidence information for a selected small number of items at the unit level could be delivered without burdening the existing infrastructure at NHSN. A related data source could be value-added if it is used for a different purpose, because extensive risk stratification is not needed for action at a unit level. Risk stratification is only needed if items are compared with other facilities or units.

HICPAC noted that simple counts are well-received, as they are understood and can be responded to. NHSN does not necessarily need to generate new reports, because that information exists and is being used at the local level.

Motion/Vote: Removal of Age Requirement from the CAUTI Surveillance Definition

A motion was made for a vote to approve the recommendation to remove the age specifications pertaining to fever from the SUTI 1a (in a patient that is ≤ 65 years of age) criteria, and from the SUTI 1b criteria (to use fever in a patient > 65 years of age, the indwelling urinary catheter needs to be in place > 2 calendar days on date of event) in the CAUTI surveillance definition. The vote carried unanimously, with no opposition and no abstentions. The disposition of the vote was as follows:

8 Favored: Brown, Bryant, Chopra, Diekema, Howell, Maragakis, Patterson, Yokoe
0 Opposed: N/A
0 Abstained: N/A

Dr. Yokoe clarified that the formal recommendation would be submitted from HICPAC to NHSN; however, this vote does not necessarily mean that these changes will be implemented.

Products and Practices Workgroup Update

Vineet Chopra, MD
Chair, HICPAC Products and Practices Workgroup

Dr. Chopra explained that the Product and Practices Workgroup's charge was:

- to develop a process for HICPAC to use when formulating recommendations for products,
- to describe how these criteria may be different from those used to develop practice-specific recommendations, and
- to provide a rationale for the criteria.

The criteria should outline:

- how the process should be applied (all products versus select product types);
- when products should be grouped as a class versus independently, and which products might be considered this way;

- how the process will address novel commercial products that may not fall into the standard US Food and Drug Administration (FDA) language for what a product should be and look like; and
- where recommendations should be generic to allow for future product development.

The Workgroup has met via teleconference approximately every 3 weeks since July 2017. They have received valuable input from FDA colleagues as well as other members of the committee. Draft materials were presented to HICPAC during the November 2017 meeting, and feedback from that discussion has been incorporated into a draft tool to guide HICPAC in product review and recommendations. The Workgroup also has begun to work on a White Paper that will be posted to the HICPAC website and could be published in the peer-reviewed literature. The paper will include the tool, the rationale behind creating it, and steps to guide its use.

Key tenets underlying the Workgroup's deliberations included:

- Products that may contribute to HAI prevention should be as fairly and fully evaluated as clinical practices.
- The process should be transparent and reproducible.
- 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.
- Products may be the most effective intervention available.

The tool is divided into several steps, or Nodes, so as to facilitate decision-making. The first step in the process – Node A – is to determine the status of a device. If a device is FDA-approved, cleared, or granted, or Environmental Protection Agency (EPA) registered, HICPAC will proceed to Node B regarding the type of approval. If a device is not appropriately approved, cleared, granted, or registered, HICPAC will not review data for it.

Nodes C-M move through a process of answering key questions about a product or device. Node N of the tool incorporates a summary of findings and a statement regarding whether the assessment supports a recommendation for the product.

A draft of the Workgroup's White Paper outline includes:

- Introduction
 - HICPAC did not have a standardized process summarizing and outlining how evidence may be used to make recommendations for specific products
 - The Workgroup was convened to address this gap
- Scope
 - A description of the criteria and processes for assessing products
 - The goal is to add transparency to the process, not to serve as a clearinghouse for specific products from industry
- Methods
 - How the Workgroup developed and refined a worksheet to guide the review and evaluation process for novel infection control products
- Summary
 - The process for the development of infection prevention and control practice recommendations is sound, but the assessment of evidence associated with infection control products is less so
 - This standardized approach allows for a transparent and systematic approach to reviewing the evidence behind products

In conclusion, Dr. Chopra posed the following questions for HICPAC discussion:

- What suggestions does HICPAC have (if any) for the Nodes?
- Should the standards for assessing practices be different from the standards for assessing products?
 - This approach is different and has additional steps that extend beyond a review of the published peer-reviewed evidence.
- What suggestions would HICPAC have for the final recommendation and summary?
 - Does what we have make sense to HICPAC?
 - Any suggestions for improving the final statement?

Discussion Points

HICPAC thanked Dr. Chopra his leadership of this Workgroup.

Regarding the categories listed in Node B in the tool, FDA explained that Premarket Approval (PMA) is a regulatory process for Class III medical devices, which is the highest-risk type of device. Many respiratory devices, such as certain types of ventilators and cardiac devices, fall into this classification. The process before submitting a PMA is stringent. Most of the time, a sponsor has to have conducted clinical trials prior to submission.

Dr. Chopra added that some of the associated clinical trials may not be in the peer-reviewed literature, so it is important to look beyond information that normally would be sought. The PMA classification is a signal to look for those additional data sources.

Consumers Union found the draft Nodes to be interesting and on target. HICPAC may have difficulty answering most of the questions objectively: the PMA process is rigorous, but most products never go through the PMA process, but through the 510(k) process, which is based on a predicate device.

FDA explained that the 510(k) process addresses Class I and II devices, which are considered to be of low- to intermediate-level risk. The PMA process is for the Class III, high-risk devices. In the 510(k) process, FDA compares substantial equivalents to a predicate that is an already-cleared device; however, it is not a “checklist” process. Sponsors still must conduct performance testing that may include bench, clinical, and animal testing in order to prove substantial equivalence to the predicate.

Regarding Node F, which addresses evidence of efficacy and the quality of that evidence, HICPAC pointed out that this point could be subsumed into the evaluation of overall quality of evidence. However, in a document that evaluates devices, the funding sources of the evidence should be called out explicitly so that any bias related to the product or evaluation of evidence could be identified.

HICPAC asked whether this tool is intended to be used for products involved in guideline recommendations, or if devices relevant to infection prevention will be evaluated as they are released to the market.

Dr. Chopra replied that the Workgroup has discussed this question often. Their first step was to craft the process regardless of its intended use so that evaluations are performed consistently every time. They have considered whether the tool could be applied to all new products, or only to certain products that may have benefits. If the purpose were to evaluate all products, they would “have their hands full” for many years. He envisioned that a product undergoing this process would have evidence of benefit, perhaps through clinically published data.

Dr. Bell added that even simply listing the factors that go into a decision is helpful. He emphasized that this tool will not be made available for every product; entire agencies have tremendous competence to do that evaluation work. However, this tool would be useful for an array of potential products that are often implemented for infection control. Before making a recommendation within a guideline for a product, for example, a clear process is needed for assessing proprietary products. There is room for a parallel pathway for devices that do not require FDA- or EPA-type approvals or registration. For instance, a physical object could make devices easier to clean. It would not require a label claim because it is not a chemical. There may come a time when HICPAC wishes to recommend use of such a product. After approximately Node F of the draft tool, the flow is likely to be clear.

HICPAC emphasized that the draft framework is thoughtful and clear and asked whether the Workgroup had tried to “test drive” the tool with any product recommendations.

Dr. Chopra replied that the Workgroup had conducted a few “test runs” with products in existing HICPAC recommendations. Finding data and evidence was an interesting aspect of these tests, as not all were easily retrievable. Pages of the FDA website have some of this information, but in some cases, there is insufficient evidence to answer the questions, and some pages are taken down in time, leading to missing data. The Workgroup tested a product that is widely used and is well-known to all of them, and there were gaps even then in that case. He agreed that the tool “comes together” around Node F, when consistency begins to emerge. The Workgroup intends to conduct additional “test drives” and to add components to the tool, such as the suggestion to identify the funding source, if possible.

American Nurses Association (ANA) expressed support for the tool and hoped for additional articulation regarding human factors and the integration of education and time needed to achieve competency when an instrument or product is introduced into the current work flow and framework.

AORN found the algorithm to be a useful resource that could be used by other organizations that develop guidelines. AORN has been considering how to evaluate products as well. They currently limit their search to peer-reviewed literature, but struggle when a product does not have any peer-reviewed literature, only FDA submission data. AORN wondered how FDA submission data would be cited in a guideline.

Dr. Chopra responded the FDA submission data that are available, are available online through URLs. HICPAC probably would link to those URLs, recognizing that URLs may change or be lengthy. It was suggested on a Workgroup call to store such data centrally to enable access to the data as they were available at the time of the review. The links could be shortened in a standardized fashion to have a concise dataset identifying all of the data sources.

FDA agreed and pointed out that while a certain amount of data can be accessed on the public FDA site, the bulk of every submission from a sponsor is confidential and will not be published. If someone from the public wishes to look at a particular device, they can file a Freedom of Information Act (FOIA) request. Some information cannot be released publicly, such as the bulk of the testing that has been done.

Regarding the final summary statement, the original goal of this process was to help HICPAC internally evaluate the role of products within recommendations regarding prevention of a specific type of HAI. Restating that goal will help the HICPAC decide how to incorporate this tool into a recommendation. Within the White Paper and within the discussion, they must continue to be clear that HICPAC’s process is focused on preventing HAIs and on patient safety issues. A

product might be part of that work, and this is the process they will follow to evaluate a product.

C. auris Update

Snigdha Vallabhaneni, MD, MPH
Mycotic Diseases Branch
Division of Foodborne, Waterborne, and Environmental Diseases
National Center for Emerging and Zoonotic Infectious Diseases
Centers for Disease Control and Prevention

Dr. Vallabhaneni recalled that she had provided a presentation on *C. auris* at a HICPAC meeting in 2016. *C. auris* is a public health threat because it is a highly drug-resistant yeast with levels of resistance not seen in other types of *Candida*. Further, it causes invasive infections associated with high mortality, and it spreads easily in healthcare settings.

Two years ago, one case of *C. auris* was under active investigation. By December 2016, approximately 30 cases were being investigated. While these cases were primarily in New York, other states were involved. Currently, approximately 300 clinical cases were diagnosed from clinical specimens obtained during routine care. Over 700 clinical and screening cases have been identified through point prevalence surveys as part of investigations surrounding the clinical cases. Most of the cases have been in New York, New Jersey, and Chicago, Illinois.

CDC believes that *C. auris* is beginning to emerge. A retrospective “lookback” is conducted whenever a case is identified, and no *C. auris* has been noted before approximately mid-2015. *C. auris* has now been found in 11 states in the US, with New York bearing the highest burden, with approximately 200 of the 300 clinical cases. Texas is the most recent state to identify a case.

Of the *C. auris* isolates, 90% are resistant to Fluconazole, 30% to Amphotericin B, and 3% - 4% to an Echinocandin. Fortunately, a pan-resistant isolate has not been observed in the US; however, reports of pan-resistant isolates are increasing in other parts of the world, so it is likely “only a matter of time” before one is seen in the US. *C. auris* causes invasive infection, and 40% to 50% of the 300 clinical cases are BSIs. Of those, 40% of patients died within their in-hospitalization. Granular data are not available on clearance of BSIs.

C. auris affects the “sickest of the sick” patients. Similarities in their case reports are notable:

- Extensive healthcare exposure, especially long-term care facilities
- Tracheostomy
- Ventilator
- Percutaneous endoscopic gastrostomy (PEG) tubes
- Central catheters
- On antibiotics and antifungals
- Colonization with another multidrug-resistant organism (MDRO), especially CRE, is a risk factor for *C. auris* colonization, based on a case-control study in New Jersey

In March 2017, in response to a case of *C. auris* passing through a vSNF, the Chicago Department of Public Health conducted a point prevalence survey on a ventilator-tracheotomy floor of the facility and found that 1 of 69 (1.5%) of the patients were colonized with *C. auris*. Another survey was conducted in January 2018 and found that 29 of 67 (43%) of the patients were colonized with *C. auris*. The facility was aware of *C. auris* but had not implemented extra precautions in that time. This example represents one of the worst-case scenarios, as the

average prevalence in any vSNF has been approximately 20%. This survey also illustrates challenges with cohorting and demonstrates frequent co-colonization of *C. auris* and other MDROs, including *Klebsiella pneumoniae* Carbapenemase (KPC), CRE with unknown mechanism of resistance, New Delhi metallo-beta-lactamase (NDM), Verona integron-encoded metallo-beta-lactamase (VIM)-CRPA, and KPC-CRPA, in various combinations.

Transmission is affected because these patients are colonized for the long term, primarily on the skin. Patients are less frequently colonized in the gastrointestinal (GI) tract. Of the approximately 200 patients with *C. auris* in New York who were followed over time, only 16 have “cleared” colonization. They are identified as “cleared” after two sets of negative swabs from every body site in which a swab could be taken. These patients are generally discharged. Unsurprisingly, patients who remain in a healthcare facility do not clear colonization and therefore contribute to ongoing transmission of *C. auris*.

C. auris has also been found in the hospital environment, as confirmed by data from the UK two years ago. *C. auris* has been found on many types of surfaces in patient rooms, as well as on mobile equipment. Many vSNF facilities are configured such that three and four patients occupy a single room, which makes for a complicated situation when one patient is colonized and others are not. Controlling the spread of *C. auris* requires a three-pronged approach:

- Detection
- Treatment
- Infection control

Challenges are associated with:

- detection and identification;
- a lack of decolonization and source control strategies; and
- environmental disinfection.

In terms of decolonization and source control, the effectiveness of chlorhexidine has been considered, and good *in vitro* data for chlorhexidine are available. Antifungals could also be used. It is known that treating *Candida* itself in patients with invasive infection does not clear their colonization: colonization persists on their skin and other sites. Consideration also has been given to whether removal of the pressure of antibiotics and antifungals helps with colonization.

Work in the UK has shown that *C. auris* was effectively inhibited by chlorhexidine *in vitro* at concentrations below 2% and 4% chlorhexidine, and by some chlorhexidine wipes. Chlorhexidine's *in vitro* efficacy depended upon the strains. Most of the UK isolates were the South Asian strain, and it seemed like there was less efficacy with that strain. *In vivo* studies have not been conducted, so the actual reduction of colonization with the use of chlorhexidine is unknown. In facilities that already use chlorhexidine bathing as an intervention, perhaps because of CRE, little reduction is observed in colonization. This point still needs to be evaluated.

Work done by Dr. Cadnum and his group found that quaternary ammonia products do not seem to be effective for environmental disinfection for *C. auris*.² There was a 4-log reduction with MRSA using quaternary ammonia products, but the desired log reduction was not achieved with

² Cadnum et al., 2017

C. auris. However, some bleach-based products are effective for *C. auris*, as are other products on “List K: EPA’s Registered Antimicrobial Products Effective against *Clostridium difficile* Spores.” Products such as Oxivir® Tb are not on List K, but appear to be effective based on this early work. An abstract by Rutala, et al, presented at IDWeek on other agents for environmental disinfection showed a low log reduction with quaternary ammonia products, and some efficacy when quaternary ammonia products were combined with alcohol.³ Promising *in vitro* data are available for vaporized hydrogen peroxide, but no “real-world” assessments of its efficacy have been conducted.⁴ UV light data from a laboratory study show that 5 minutes of UV light at 10mm, 20mm, and 40mm was not as effective at reducing *C. auris* as it was for MRSA. Increasing the exposure time for *C. auris* did help, with about 20 minutes of exposure time achieving a greater than 4-log reduction.

Environmental disinfection work is in its infancy, and although some products look promising for *C. auris*, evidence of efficacy is limited, and more data are needed in order to make specific recommendations. CDC continues to grapple with a number of questions regarding products to recommend for infection control, and when they should be used for environmental disinfection:

- What products should be used?
 - Are there options that are not included on EPA’s List K?
- Should products be used just for a case patient’s room(s), or for the entire floor where the patient is admitted?
- Should products be used preemptively at all LTCFs with ventilated patients in an endemic area?

Over 30 countries have now reported *C. auris* cases. *C. auris* is common in some international hospitals, representing up to 40% of *Candida* infections in 1 Indian and 1 Kenyan hospital. Of *Candida* infections, 10% occur in private South African hospitals, where *C. auris* is the second most common *Candida* spp. in those facilities. Spain recently reported that 40% of their *Candida* infections are now due to *C. auris*. Given that there is still a great deal to learn about *C. auris*, Dr. Vallabhaneni welcomed HICPAC’s thoughts and suggestions.

Discussion Points

ACOEM asked whether studies have assessed patients who do not become colonized with *C. auris*, and if there is any correlation with other organisms that are “holding sway.”

Dr. Vallabhaneni indicated that *Malassezia furfur* is the most common type of yeast found on skin. CDC is collaborating with the National Institutes of Health (NIH) to understand what constitutes natural skin flora, what happens to long-term care facility (LTCF) residents who are bathed with chlorhexidine or exposed to antibiotics or antifungals, and what happens when they are discharged. This long-term collaboration is beginning to yield preliminary data; they hope to learn about the conditions that cause people to be colonized with *C. auris* and what can be done to help reduce the burden.

Due to investments in state public health laboratory capacity, testing is available for *C. auris* for hospitals around the country. HICPAC wondered whether CDC is tracking how many isolates of

³ Rutala et al, ID Week 2017

⁴ Schelenz, Federation of Infection Societies Poster, 2017

C. auris species are submitted to state laboratories for confirmatory testing.

Dr. Vallabhaneni replied that while the ARLN was not founded with *C. auris* in mind, it could not have been timelier for helping to detect this organism. Approximately 1200 isolates have been submitted to date to the *Candida* program within the ARLN, a majority of which are ruled out for suspected *C. auris*. Approximately 188 isolates of *C. auris* have been identified through the ARLN.

HICPAC applauded CDC's excellent educational materials, which particularly benefit small regional hospitals, many of which do not have the capacity to identify *Candida* at the species level. Further, many hospitals, including large academic centers, do not usually identify non-sterile isolates of *Candida* to the species level. The first isolates are not necessarily invasive; rather, they are probably colonizing strains, which many hospitals are not likely to identify.

Dr. Vallabhaneni emphasized that detection is one of the challenges associated with controlling this organism. Not only can the organism be misidentified, some facilities do not even try to identify the *Candida* species. Perhaps not identifying the species is logical, as it will not be treated, but identification is important in the *C. auris* era. CDC is trying to recruit long-term care facilities (LTCFs) in certain high-risk areas to submit isolates from non-sterile sites to be speciated in order to detect *C. auris* early.

HICPAC asked whether it is known whether Fluconazole or the other triazoles are risk factors for *C. auris* acquisition, and if any environmental reservoirs have been identified in the community or in agriculture.

Dr. Vallabhaneni indicated that in the early analyses they performed, approximately 50% of patients had received an azole in the 30 days prior to *C. auris* being detected. These data are not available for the more recent cases, and the study was not a case-control to determine risk factors, but the 50% rate of receipt of an azole is much higher than she would expect. On average, 7% of patients in an intensive care unit (ICU) will receive any antifungal. The higher proportion of patients receiving azoles may put them at risk for *C. auris*. There is a great deal of interest in the environmental reservoir. This organism prefers environments with high temperatures and high salinity, but an environmental reservoir has not been identified.

Dr. Cardo pointed out that the *C. auris* situation is a good example of the importance of early detection and containment. Many cases of *C. auris* have been detected, and most of them are in 2 states, but laboratories need to be prepared, particularly because of the challenge of detection. As soon as one case is found, action should be taken. Implementing a containment strategy quickly will restrict spread to one or two patients as opposed to many. Because of the number of affected patients, the strategy in New York is no longer for containment: now the strategy is for prevention of transmission. For Chicago, CDC has been providing modeling to assess specific facilities and to help implement proactive testing. Once *C. auris* starts spreading, it is difficult to contain.

CSTE asked whether there is a sense of the age distribution of affected patients and whether *C. auris* has been seen in neonatal patients in NICUs.

Dr. Vallabhaneni replied that all but one case in the US have been in adults, generally over 70 years of age. However, there is a small population of affected patients in their 20s, such as those who are paraplegic and in an LTCF. One neonatal case has been reported in the US in New York, and an extensive investigation was conducted of that case. *C. auris* assuredly has the potential to affect neonatal populations: CDC has participated in investigations in Venezuela

and Colombia, where there have been major outbreaks in NICUs.

DNVGL asked whether any proactive programs are underway to educate LTCFs that have thus far avoided *C. auris* before they see their first case.

Dr. Vallabhaneni said that this education represents a significant need because *C. auris* is an organism that “sets up shop” in LTCFs and spreads. A CDC group will present on *C. auris* at the upcoming APIC conference. Outreach efforts are underway, including a press release, to make LTCFs aware of this important problem. LTCFs are a particular audience for outreach, as they are amplifiers because of their at-risk patient populations.

DNVGL stressed many freestanding LTCFs do not send their staff to APIC, or to any national conferences. These facilities may not receive the important information.

Dr. Cardo pointed out that issues in vSNFs and LTCFs extend beyond the problem of *C. auris*. Part of containment is performing an infection control assessment, and CDC is focusing on basic infection control in these settings.

HICPAC asked what is known about the persistence of *C. auris* on environmental surfaces.

Dr. Vallabhaneni replied that laboratory experiments have shown that live cells can survive on surfaces for up to 2 weeks, while cells with some esterase activity can survive for 4 weeks. When colonized patients are in the environment, but their colonization has not been identified, they contribute to transmission.

Noting the countries that have a high prevalence of *C. auris* amongst their *Candida*, HICPAC wondered about possible recommendations regarding travel screening. It might be wise to consider screening for certain regions in the US as well.

Dr. Vallabhaneni responded that CDC’s laboratory has conducted whole genome sequencing that indicates strong phylogeographic structure in the world. It is believed that there are 4 clades of *C. auris*. In the US, most of the cases are related to the South Asian strain, with some associated with the South American strain, and 1 case associated with the South African strain. In these cases, a patient receives healthcare abroad and then presents to a US hospital with a strain of *C. auris*. Currently, 6 cases in the US have a definite travel connection. The majority of those cases are related to the South Asian strain. CDC released guidance last October with the specific recommendation to suspect *C. auris* in people who have had an overnight healthcare stay abroad in the last year. Hospitals do not have a way to screen patients, but they should consider speciating any isolates that they have from a patient so that *C. auris* can be detected.

Dr. Bell asked about the proportion of cases in the US that are from LTCFs or vSNFs, and if Dr. Vallabhaneni is aware of any locations that are implementing strategies, such as universal glove use or other physical barriers, as opposed to disinfectants or decolonization.

Dr. Vallabhaneni answered that this question is challenging, as in the majority of cases, detection occurs in the hospital when that patient is transferred in. Universal glove use and other physical barriers have not been tested as a strategy.

HICPAC asked whether healthcare personnel were tested for colonization in any of the studies.

Dr. Vallabhaneni replied that healthcare personnel have not been tested for colonization in the US. It is assumed that colonization would be transient on the hands. Spain and the UK have

screened 700 to 800 healthcare workers who were involved in the care of a *C. auris* patient. They found only one worker who was colonized transiently, and when she was retested, she was no longer colonized. It is possible that healthcare personnel are less likely to become colonized in the community, and because healthy people generally have a microbiome that outcompetes *C. auris*. Someone would have to be in a healthcare facility receiving a great deal of care to acquire it. In a recent phone call with public health officials in Japan, the first to identify a case of *C. auris*, they learned that Japan has only seen 7 or 8 cases from 1999 to the present. Those patients have only had ear infections and no BSIs. This presentation may be specific to the East Asian clade: the only ear case in the US was in New York, and that strain was linked to the East Asian clade.

The Association of State and Territorial Health Officials (ASTHO) indicated that Minnesota plans to make *C. auris* reportable this summer and will communicate with healthcare partners in an effort to convey the seriousness of *C. auris*.

Public Comment

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

Dr. Kavanagh thanked HICPAC for the opportunity to provide comments.

Dr. Kavanagh has been in medicine a long time and recalled that surveillance and isolation were the “mainstay” of approaching MRSA epidemics. Based on his research, reading, and insight, he is disappointed at the drift away from those strategies. The insistence on having double-blind studies before action can be taken does not keep up with the pace of these epidemics. By the time enough information is gathered, the epidemic will have progressed to a point where the information may not even be applicable. He prefers an approach that first implements time-tested strategies, and then conducting a double-blind study if needed, putting the onus not on proving that something that is time-tested works, but on proving what does not work.

The UK National Health Service (NHS) tests everyone who is at high risk for MRSA. While NHS does not describe their protocol as “universal testing”, so many categories are listed as high-risk that their protocols and publications state that, “The logical conclusion of risk factor assessments and the results of modeling studies is that the most appropriate approach to the reduction in MRSA carriage in the population, and resultant MRSA infections, is the universal screening of all admissions to hospital (either at pre-admission clinics for elective admissions or immediately on admission for emergency admissions).” The UK, along with the Netherlands and Northern Europe, has much lower incidence of MRSA culture-positive results. The UK has dropped substantially. Hand hygiene is important: data from the UK show that even in the case of a hand hygiene campaign, surveillance, and a decolonization campaign for MRSA, MSSA did not decrease, but MRSA did. Obviously, an MDRO protocol is important, but “that extra step” is also needed. In the context of MDROs, hand hygiene should be viewed as a back-up measure. These organisms should not be on a healthcare worker’s hands in the first place, and hand hygiene should not be viewed as a primary intervention goal.

Regarding inaccuracy in reporting to NHSN, and the finding that risk adjustments may be 30% to 60% off, it is important to realize the differences in facility performance. The difference can be 10-fold. Therefore, a 30% difference in the measurement instrument is not unexpected. Dr. Kavanagh expressed whole-hearted support for NHSN.

Dr. Kavanagh said that any patient transferred from another facility, whether an infant or an adult, should to be screened for MDROs. Facilities in the US have a huge problem with MDROs.

Regarding the day's discussion of CAUTI, Dr. Kavanagh has written a letter to the editor on the subject. The main concern about the CAUTI metric is the denominator used by NHSN, which is different from the AHRQ denominator. The AHRQ metrics look at total admissions, but CDC uses a denominator that is catheter-based. The concern is that the most effective way of reducing urinary catheter infections by far is to not use a catheter. That approach requires more nursing staff and raises other issues, but it is the most effective way to reduce CAUTI. The current CDC metric does not look at facilities that are not catheterizing patients. In fact, numbers for these facilities could be perceived as worse, because catheters are only given to the sicker patients. Dr. Kavanagh hoped that this point could be incorporated into the denominator – total number of patients or catheter usage to begin with – whether or not a catheter is inserted.

Dr. Kavanagh commented that the FDA 510(k) process needs further improvement and work. The vast majority of implants are approved through the 510(k) process, and he does not think that the evaluation test is adequate. The Institute of Medicine (IOM) found the process to be flawed and suggested that a new process be developed.

Regarding the screening of healthcare workers, Dr. Kavanagh described an email he received from the Editor of *Antimicrobial Resistance & Infection Control*. Her email noted that screening of healthcare workers is routine in the Netherlands, where sick leave is a paid benefit, and workers could become colonized when they are off duty. There is 30% carrier rate, and these workers can be placed to work in other areas. Dr. Kavanagh supports detection of healthcare worker colonization, followed by treatment.

Dr. Kavanagh is not a supporter of using chlorhexidine, as he believes that the underlying research for its efficacy for universal use is irrefutably flawed. Further, there are many concerns regarding chlorhexidine in neonates. FDA warns that it should be used with caution and that it can cause irritation, and even burns, in neonates. Premature children have extremely thin skin, and although chlorhexidine is called an antiseptic, in reality, it is an antibiotic, and resistance to it can develop. In Dr. Kavanagh's opinion, this intervention should be avoided in neonates and in the very young.

Liaison / Ex Officio Reports

American College of Occupational and Environmental Medicine (ACOEM)

The ACOEM national meeting was held in New Orleans, Louisiana, April 27-May 2, 2018. This meeting included a substantial tally of scientific sessions that addressed the medical center workplace. ACOEM's written report submitted to HICPAC lists relevant guidelines and guidance, position statements, legislation, press activities, and publications. When the Medical Center Occupational Health Section met, bringing together 60 to 70 directors from occupational medical programs that are embedded within medical centers throughout the country, substantial concern was expressed regarding some of the elements in the forthcoming updated TB Guidance. Further details regarding these concerns are included in the Discussion Points following the presentation to HICPAC from Dr. Sosa and Dr. Belknap.

American College of Surgeons (ACS)

Most of ACS's work on HAIs focuses on these registries: Bariatric Registry, ACS National Surgical Quality Improvement Program (ACS NSQIP®), Cancer Registry, and Trauma Registry.

These registries are in the process of migrating onto a new, integrated platform, which will be more efficient. Other activities include developing an ACS quality and safety manual, Optimal Resources for Surgical Quality and Safety, referred to as the “Red Book.” This manual addresses standards for perioperative quality and safety. ACS also is working on the AHRQ Safety Program for Improving Surgical Care and Recovery, which is an enhanced recovery dissemination project that includes best practices for SSI and CAUTI. Additional details are available in the written report.

America’s Essential Hospitals (AEH)

AEH did not provide a verbal report, but submitted a detailed written report (see Attachment #2).

Agency for Healthcare Research and Quality (AHRQ)

AHRQ continues to support research and implementation projects regarding AR bacteria efforts in three domains:

- Promoting antibiotic stewardship
- Preventing transmission of resistant bacteria
- Preventing HAI infections in the first place

AHRQ supports projects in multiple healthcare settings, including acute care hospitals, long-term care, and ambulatory care.

AHRQ has reviewed the first 4 rounds of applications responding to 2 new Combating Antibiotic-Resistant Bacteria (CARB)-specific Funding Opportunity Announcements (FOAs) for R01 and R18 applications, in addition to the renewed HAI prevention FOAs. AHRQ appreciated the opportunity to present to SHEA’s membership to inform them of AHRQ’s areas of scientific interest, the availability of research funding, and to stimulate additional interest in applying for AHRQ grants to combat AR.

The AHRQ *Safety Program for Improving Antibiotic Use* is ongoing. This program is funded and guided by AHRQ and is led by Johns Hopkins University and the Non-Partisan and Objective Research Organization at the University of Chicago. The pilot period recently closed, with activities in that cohort coordinated in 3 integrated delivery systems encompassing acute care, long-term care, and ambulatory care. A 1-year acute care cohort kicked off in December 2017 with over 425 hospitals, including over 80 critical access hospitals and 90 US Department of Defense facilities. Long-term care and ambulatory care cohorts will follow in December 2018 and December 2019, respectively. As with all Comprehensive Unit-based Safety Program (CUSP) projects, this project will result in a toolkit that will be available on the AHRQ website upon completion.

The AHRQ *Safety Program for Improving Surgical Care and Recovery* is a collaborative program to enhance recovery of surgical patients that is funded and guided by AHRQ, and conducted by Johns Hopkins University and ACS. 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. This 5-year project also aims for implementation in 750 hospitals nationwide, addressing a variety of surgeries in a phased approach. Colorectal surgery is the focus of the first cohort, which is ongoing. Orthopedic surgery has been added to the second cohort, which began in March 2018. More than 240 hospitals are currently participating.

The AHRQ *Safety Program for Intensive Care Units: Preventing CLABSI and CAUTI* is currently

expanding from the original project in four HHS Regions to nationwide expansion. This program aims to reduce CLABSI and CAUTI in ICUs with persistently elevated rates of these infections. Over 300 ICUs were recruited to participate in the first phase, and an additional 450 to 600 additional ICUs are planned for recruitment in the expansion phase. Implementation has begun in the first 1-year cohort of the expansion phase, involving over 125 ICUs.

Association of periOperative Registered Nurses (AORN)

AORN is a specialty organization in the Nursing Infection Control Education Network (NICE Network), a collaboration with ANA and CDC. AORN convened a 2.5-hour workshop during its conference in March 2018 that focused on screening and decolonization in surgical patients, emphasizing personal protective equipment (PPE) and good practices for selection and donning and doffing. They also discussed standard and transmission-based precautions in this “back-to-basics” workshop. Everyone who attended learned something new. AORN thanked CDC for this opportunity.

AORN met with ACS, the American Society of Anesthesiologists, APIC, the Association of Surgical Technologists, the Council on Surgical and Perioperative Safety, and The Joint Commission (TJC) on February 27, 2018, to review and discuss the literature related to recommendations for operating room (OR) attire, specifically ear and hair coverings. The participants in this collaborative meeting were open to coming to consensus, and AORN was happy to be a part of that discussion. This group concluded the following:

- Evidence-based recommendations on surgical attire developed for perioperative policies and procedures are best created collaboratively, with a multi-disciplinary team representing surgery, anesthesia, nursing, and infection prevention.
- The requirement for ear coverage is not supported by sufficient evidence.
- At present, available scientific evidence does not demonstrate any association between the type of hat or extent of hair coverage and SSI rates. One recent study on head coverings (disposable bouffant or skullcap, cloth cap), identified that the commonly-available disposable bouffant hat is the least effective barrier to transmission of particles. Other issues regarding areas of surgical attire need further evaluation.

The AORN guideline stands as written and currently recommends full hair coverage, including the ears, but the document is under revision. The AORN guideline does not include any stipulation on types of head coverings, but rather simply recommends head covers. The type of head covering that works best is left to an individual practitioner. AORN guidelines do allow cloth caps, to be worn as long as they are clean. AORN recommends laundering in a healthcare-accredited laundry. There is quite a bit of confusion about these guidelines. For the revised guidelines, AORN will work with multidisciplinary groups to gather feedback during the drafting process. The revised guideline will be available for public comment from January 2, 2019, through February 22, 2019. The public comment period was extended to allow for ample time to receive feedback. AORN looks forward to HICPAC’s input on the guideline.

AORN’s Global Surgical Conference & Expo 2019 will be convened April 6-10, 2019, in Nashville, Tennessee. Proposals to speak are due by May 31, 2018, and poster abstracts are due by September 30, 2018. Experts are encouraged to submit applications.

In terms of guidelines and guidance, the *Guideline for Sterilization* is available for public comment until June 6, 2018. The *Guideline for Safe Environment of Care*, which includes chemical and fire safety as well as statements about distractions, will open for public comment in June 2018. The *Guideline for Sterile Technique* will open for public comment in July 2018. It

may include changes regarding physically observing and monitoring the covering of sterile tables. The *Guideline for Transmission-based Precautions* (formerly *Transmissible Infections*) opens for public comment in August 2018. The focus of this guideline will be on PPE, Standard Precautions, and transmission-based precautions specific to the perioperative setting. There is confusion regarding implementing airborne precautions in the perioperative environment. AORN may reach out to HICPAC members for advice in this area for the TB section.

Association of Professionals of Infection Control and Epidemiology (APIC)

APIC is excited for the expected release in June 2018 of a new implementation guide, the *Infection Preventionist's Guide to the OR*. In addition, APIC is preparing for its annual conference to be convened June 13-15, 2018, in Minneapolis, Minnesota.

American Nurses Association (ANA)

ANA and CDC are completing a 2-year collaboration involving 20 specialty or state nursing organizations. During the collaboration, the organizations have tailored infection prevention and control education to maximize adherence and enhance nurse confidence in caring for patients with potentially highly contagious diseases. This experience has been an “aha” moment for these specialty groups, and ANA is grateful to CDC for this opportunity and continued collaboration. ANA and CDC wrote a White Paper in 2017 defining nurses' role in antibiotic stewardship. This paper came to the attention of experts in the UK, from Public Health England and the Royal College of Nursing. They have engaged in conversation discussing similarities and ways that they can support one another in crystalizing the team approach, and the role of nurses specifically, in antibiotic stewardship across the continuum of care. They all plan to attend the APIC conference and look forward to that face-to-face meeting.

Association of State and Territorial Health Officials (ASTHO)

ASTHO highlighted its role in co-convening the Council for Outbreak Response: Healthcare-Associated Infections and Antibiotic-Resistant Pathogens (CORHA) meeting during the week of May 21, 2018, in Atlanta. This group intends to develop and promote tools to assist with detection, reporting, investigation, and control of HAI outbreaks.

Centers for Medicare and Medicaid Services (CMS)

CMS did not provide a verbal report, but submitted a detailed written report (see Attachment #2).

Council of State and Territorial Epidemiologists (CSTE)

CSTE did not provide a verbal report, but submitted a detailed written report (see Attachment #2).

Consumers Union (CU)

CU has weighed in on legislation that may be of interest to HICPAC called the “Right to Try Act,” which pertains to making drugs available that have not been approved by FDA. The Act utilizes a broad definition of who can access those drugs. A version of the bill has been passed by both the House and Senate, and the Senate version is going back to the House for reconciliation. CU is opposed to the legislation, given the concern that it could undermine FDA's system of approving drugs and erode consumer confidence in the US drug supply. These concerns could

carry over into antibiotics and other medications and devices.

Recently, CU helped to create an independent coalition of patients called the Patient Safety Action Network (PSAN). PSAN's work on patient safety issues is patient-led and patient-driven. The Safe Patient Project has been phased out. *Consumer Reports* (CR) will no longer conduct advocacy work on patient safety, but will transfer this work to PSAN. PSAN is comprised of many of the advocates CU has worked with over the years. Lisa McGiffert, who directed the Safe Patient Project, will retire at the end of May 2018. However, she will continue to engage in patient safety work with PSAN.

CU has written a number of articles that are of interest. Highlights of the articles include CR's updated Ratings of hospitals, published in February 2018. That project is also being phased out. CR will no longer publish ratings. CU will continue to cover health issues in the magazine and online. While AR continues to be an issue that is important to CU, resources will be shifted to some other emerging issues such as privacy, including medical privacy; and food issues, including antibiotic use in the production of food. There is a desire for CU to shift the landscape in which it has invested over the last 15 years to other areas of equal importance to consumers.

Dr. Yokoe expressed gratitude for Lisa McGiffert's invaluable contributions to HAI prevention and patient safety.

DNVGL Healthcare, Inc.

DNVGL did not provide a verbal report.

Food and Drug Administration (FDA)

FDA published the Final Order exempting the N95 surgical face mask from 510(k) review on May 17, 2018. FDA has Memoranda of Understanding with CDC in many areas, including the National Institute for Occupational Safety and Health (NIOSH). In the past, when a sponsor wanted an N95 respirator to be cleared by FDA, the first step was certification by CDC. Once certification was obtained, the sponsor would move to FDA for the review process. FDA has worked on the exemption process with CDC and NIOSH for several years. The Final Order exempts N95s only under certain conditions, which were created in collaboration with CDC. Some N95s, such as those that contain antimicrobial coatings, will undergo the standard FDA review process.

FDA continues its work with manufacturers of heater-cooler devices regarding issues with biofilm. Additional efforts are underway with manufacturers of various scopes, including duodenoscopes. FDA also works with various manufacturers of the automatic endoscope reprocessors (AERs) and liquid chemical sterilizers. Many sterilizer companies hope to enter the market of duodenoscope reprocessing. FDA works with the companies on adequate reprocessing steps, as well as on scope design and whether the scopes can be reprocessed adequately in different AERs.

In addition, FDA continues to work with standards organizations, academic organizations, and various government agencies on the surgical isolation gowns that were brought into the 510(k) review process approximately two years ago. Particular focus with standards organizations is on sponsor claims related to the devices' PPE properties.

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

HRSA partners with CDC to create 3 “one-pager” documents to help critical access hospitals find, and add, the Patient Safety Component of the NHSN Annual Facility Survey into their profile. CDC will begin sending NHSN Annual Facility Survey data to FORHP regularly to integrate into the data reports sent out to critical access hospitals, as well as to state grantees in order to properly monitor and provide technical assistance to hospitals. FORHP attended CDC’s HAI/AR All-Partners meeting in March 2018 to meet with state grantees to discuss ways to collaborate.

Infectious Diseases Society of America (IDSA)

IDSA did not provide a verbal report, but submitted a detailed written report (see Attachment #2).

National Association of County and City Health Officials (NACCHO)

NACCHO continues to foster and expand partnerships with local health jurisdictions, providing resources for infection prevention and HAI outreach. The resource *Healthcare-Associated Infections: A Toolkit for Local Health Departments* was created as part of this effort. An update of this toolkit will be released in June 2018. The toolkit is particularly helpful for local health jurisdictions, given that most do not have IPs on staff.

National Institutes of Health (NIH)

NIH did not provide a verbal report, but submitted a detailed written report (see Attachment #2).

Public Health Agency of Canada (PHAC)

PHAC supports several activities in addition its work in infection prevention and control guidelines. AMR is one of PHAC’s priorities, and the Government of Canada is leading international work in AMR in different forms. PHAC has been involved in building a national AMR framework, which has four pillars, one of which is infection prevention and control. PHAC updating its guideline on the prevention and control of occupational infections in healthcare settings. Dr. David Kuhar, DHQP, CDC, attended the last meeting of PHAC’s workgroup that is updating this guideline. This meeting was a great opportunity to share information regarding occupational infection prevention and control in healthcare settings, and what aspects of the work are unique to Canada. For example, Canada has significant experience with TB, which remains a problem. Even though evidence might be the same in different countries, the manner in which each country executes its efforts differs to some extent.

PHAC is also working on a guideline focusing on the management of healthcare personnel (HCP) infected with bloodborne pathogens. PHAC held a public consultation to reach out to stakeholders and acquired feedback from over 120 organizations, both domestic and international. PHAC thanked CDC, SHEA, and NIH’s Dr. David Henderson for their assistance with this guideline, which is anticipated to be completed in Fall 2018. It will then go through approval processes and be translated into English and French, Canada’s official languages. Interest in this guideline is high. As soon as approvals are received, the guideline will be shared with HICPAC.

PHAC has begun updating its CRE guidance. This process has become increasingly

complicated with its focus on Multidrug-resistant Gram negative bacilli (MDR-GNB) and the integration of laboratory components, diagnostic stewardship, and surveillance results from different regions of the country. The challenge for PHAC is to write the guideline in way that is not over-complicated for users with few resources, particularly long-term care and other facilities.

An article from PHAC's surveillance group was recently published in *ICHE* reporting responses from 54 teaching hospitals on their responses and actions after alerts regarding contaminated heater-cooler devices. PHAC is also in the process of updating its national *Canadian Pandemic Influenza Preparedness: Planning Guidance for the Health Sector*. A number of different specific annexes are being combined for the healthcare sector. PHAC plans to review the way in which it develops guidelines, understanding the differences between guidance that needs to be disseminated quickly, versus information that requires more scientific rigor and for which the guideline development process is lengthy and resource-intensive. It is not clear whether there are better ways to develop guidelines; PHAC looks to its international partners in order to avoid duplication of efforts wherever possible.

Society for Critical Care Medicine (SCCM)

The SCCM Council recently approved a budget to develop a definition for pediatric sepsis. Currently, a panel is being assembled to work on the definition. The publication date has been set for late 2020.

Society for Healthcare Epidemiology of America (SHEA)

SHEA held its *Spring 2018 Conference: Science Guiding Prevention*, on April 18-20, 2018, in Portland, Oregon. Two of this year's program themes of the program this year included appropriate communication and public health. Highlights of the conference include:

- Focused scientific abstracts related to healthcare epidemiology, surveillance, implementation science and patient safety, and prevention strategies
- Poster and oral abstract awards for diverse professional fields related to healthcare epidemiology for all career levels
- Cutting-edge healthcare-associated infection prevention and antibiotic stewardship education plus sessions on multi-disciplinary and integrated approaches involving implementation science and prevention across the healthcare system
- Three training courses:
 - SHEA/CDC Training Course in Healthcare Epidemiology
 - SHEA Antibiotic Stewardship Training Course (pharmacy credit was awarded for this course)
 - SHEA/CDC/ADMA Post-Acute & Long-Term Care Course
- Pre-Conference Workshop: *Spreading Information Not Infection: Making Infection Prevention and Hospital Epidemiology Digestible for the Public* (new this year)
- Targeted networking breakfasts and breaks:
 - Nursing credit for the entire conference (not including the pre-conference workshop)
 - MOC for the entire conference
 - Continuation of the SHEA Mentorship Program
 - Continuation of the SHEA Epi Project Competition
 - The Women in Epi Networking Breakfast
 - Annual SHEA Education & Research Foundation dinner

The SHEA/CDC Outbreak Response Training Program (ORTP), a 2-year contract from CDC,

has been completed. All of the ORTP projects are publicly available at no cost. Included are 3 effective communication training courses, content from 2 in-person training workshops, 2 “DecisionSim” online modules, expert guidance, and 4 digital toolkits.

Planning has begun for the Decennial 2020 Meeting, which is a collaboration between SHEA and CDC, and SHEA’s partners APIC and IDSA. One session remains in SHEA’s Antimicrobial Stewardship Research Workshops supported from a grant by Merck. Antimicrobial Stewardship Podcasts also are available. SHEA has purchased a Learning Management System to house all of its online education content. The SHEA Education Committee is developing content and programming for this new online learning platform, which will make more content and learning available more broadly.

IDWeek™ 2018: Advancing Science, Improving Care will be convened October 3-7, 2018, in San Francisco, California. SHEA is excited that Dr. Jan Patterson was elected to, and has accepted, the SHEA Lectureship.

SHEA’s *Primer on Healthcare Epidemiology, Infection Control, and Antimicrobial Stewardship* launched on June 1, 2015. The primer includes 12 modules and is used frequently by training programs to deliver basic infection prevention training. SHEA is currently working on updates to the primer.

SHEA no longer develops guidelines, per se. Instead, SHEA develops expert guidance documents. SHEA’s expert guidance, *Duration of Contact Precautions*, was endorsed in January 2018 by the Society of Hospital Medicine (SHM), APIC, and the Association of Medical Microbiology and Infectious Disease (AMMI) Canada. The Guidelines Committee is currently working on an *Infection Prevention in Anesthesia* expert guidance, *Initiation of Antibiotics* expert guidance, and a NICU White Paper Series. Writing panels are being formed for 3 updates: SHEA Healthcare Workers Infection with Bloodborne Pathogens (white paper), Sterilization and Disinfection (3-part expert guidance), and Infection Prevention in Long-Term Care (2-part expert guidance).

In terms of policy, SHEA will comment on the Hospital Value-Based Purchasing (VBP) Program with regard to the recommendation to remove CAUTI, CLABSI, Colon and Abdominal Hysterectomy, SSI, MRSA Bacteremia, and CDI measures.

A Workgroup has been convened to develop and publish an antibiotic stewardship research agenda focused on identifying important knowledge and research gaps in the advancement of antibiotic stewardship implementation in practices. The Workgroup is expected to complete the agenda sometime in the third quarter of 2018, with publication in *ICHE* shortly thereafter.

SHEA has engaged in a series of press activities, including:

- Probiotics Useful in the Fight Against *C. difficile*
- World Immunization Week Recognizes Gains Brought by Vaccines, Finds Continuing Gaps
- Infectious Diseases Experts Applaud New Omnibus Funding Bill
- Infection Prevention and Control Programs are Essential to Antibiotic Stewardship Efforts
- SHEA Announces Newest Delegation of the International Ambassador Program
- Troubling Trend in Antibiotic Prescriptions in the Outpatient Setting
- Infectious Diseases Experts Applaud Legislation to Address Antibiotic Resistance

In addition, 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>)

SHEA recently launched two textbooks:

- *Practical Healthcare Epidemiology*, 4th Edition
- *Practical Implementation of an Antibiotic Stewardship Program*

Another item of note, which was raised earlier in the day, is the Leadership In Epidemiology, Antimicrobial Stewardship, and Public health (LEAP) Fellowship. This \$100,000 training award funded by CDC is a collaboration between IDSA, SHEA, and the Pediatric Infectious Disease Society (PIDS). Fellowships have been awarded to 4 promising young infectious disease physicians to strengthen healthcare prevention and public health continuum of care.

Society of Hospital Medicine (SHM)

SHM continues to work with the Health Research and Educational Trust to identify strategies for reducing MRSA, CAUTI, *C. difficile*, and CLABSI in hospitals across the US. They also have worked to develop an antimicrobial stewardship implementation guide and educational modules for hospitalists regarding the implementation of antimicrobial stewardship programs in the hospital. The guide and module are available on the SHM website. In addition, SHM continues its Fight the Resistance Campaign, which is dedicated to promoting awareness and behavior change related to antimicrobial stewardship and appropriate prescribing practices. This campaign has worked well in raising awareness among hospitalists. Antibiotics have become a "hot topic" in hospital medicine. As an example, SHM's most recent issue of *JHM* included 5 articles related to antibiotic use and antibiotic stewardship. The hospital medicine field has taken note and awareness of this issue, and SHM will continue to work in this area moving forward.

Surgical Infection Society (SIS)

The annual SIS meeting was held in Westlake Village, California, April 23-25, 2018. The theme was global surgery and infections. SIS societies and surgeons across the globe are working to develop appropriate guidelines to reduce surgical site and other surgical infections for various resource settings. On the opposite end of the spectrum, a cohort of people is interested in bringing technology to bear on issues that are important for surgeons. The best example of this area is a partnership with multiple SIS members and CDC that is working to understand the role of patient-generated health data (PGHD), including imaging and how it can be used for diagnosis, and potentially even for the management of SSIs. This work includes trying to integrate imaging and PGHD into both clinical and surveillance definitions of SSI, which will be challenging.

The Joint Commission (TJC)

TJC did not provide a verbal report.

US Department of Veteran's Affairs (VA)

The VA is addressing all of the issues discussed during this HICPAC meeting.

Adjourn

With no additional comments or questions posed, HICPAC stood in recess at 5:12 pm.

Friday, May 18, 2018

Welcome and Roll Call

Dr. Diekema called the second day of the HICPAC meeting to order at 9:11 am on Friday, May 18, 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.

Healthcare Personnel Guideline Workgroup Update

Hilary M. Babcock, MD, MPH

Medical Director, BJC Infection Prevention and Epidemiology Consortium

Medical Director of Occupational Health (Infectious Diseases)

Barnes-Jewish and St. Louis Children's Hospitals

Associate Professor of Medicine, Infectious Disease Division

Washington University School of Medicine

Dr. Babcock presented an update on Section 2 of the *Guideline for Infection Control in Healthcare Personnel*.

The Workgroup has completed a draft of *Section 1: Infrastructure and Routine Practices for Occupational Infection Prevention Services*. That section was reviewed and discussed with HICPAC and is currently in CDC clearance. The next step will be to post it to the *Federal Register*.

The Workgroup is now drafting recommendations and narrative text for the pathogen-specific sections in *Section 2: Epidemiology and Prevention of Selected Infections Transmitted Among Healthcare Personnel and Patients*.

The draft Pertussis section was approved by HICPAC in February 2018. The “draft” draft recommendations for Measles, Mumps, and Rubella were presented to HICPAC in February 2018. The Measles draft recommendations and text are in progress, and the Workgroup is beginning work on viral respiratory pathogens, *S. aureus*, diphtheria, meningococcal disease, and varicella.

For each pathogen, the Workgroup reviews and assesses the 1998 text and recommendations for elements that can be deleted, updated, or continued. Specifically, the Workgroup looks for:

- Outdated recommendations that have already been updated elsewhere, such as in recommendations from the Advisory Committee on Immunization Practices (ACIP)
- Areas with significant gaps between the 1998 recommendations and current practices
- Areas with new data or literature that can inform updated recommendations
- Areas of need, where the 1998 guideline does not address an issue that is now more common

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

When a pathogen section requires a full literature review – which so far has been only for *S. aureus* – the Workgroup develops key questions, which may be more open-ended than in other guideline production processes. The key questions are approved by HICPAC.

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, particularly in areas where there is little directly applicable literature.

Some areas within occupational medicine for healthcare personnel are addressed in the *HICPAC Core Practices Document: 8. Occupational Health*. Recommendations in areas pertaining to vaccination refer to relevant ACIP recommendations. General guidance about processes and sick leave policies are also in the *Core Practices* document, and are expanded upon in Section 1 of the Guideline.

The pathogen sections in the 1998 guideline are:

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

Dr. Babcock updated HICPAC on the status the *S. aureus* literature review:

- The literature search identified 3791 articles.
- Of these, 3464 were excluded at the title and abstract screen, and 321 were excluded at the full text review.
- Of the remainder, 133 were included for extraction.
- Thus far, 25 data extractions are complete.

When all 133 extractions are complete, the Workgroup will review the extraction tables and proceed toward recommendation development.

Dr. Babcock presented draft recommendations and narrative text for the updated Mumps section of the Guideline. The Workgroup reviewed the 1998 recommendations for gaps and outdated recommendations, reviewed ACIP's 2011 recommendations for immunization of healthcare personnel,⁵ and reached out to CDC Mumps SMEs for input before creating draft recommendations and narrative text. The "draft" draft recommendations were presented to HICPAC in February 2018. The 1998 recommendations that focus on vaccination and presumptive evidence of immunity will be deleted, and the narrative will refer to the ACIP

⁵ Immunization of health-care personnel: recommendations of the Advisory Committee on Immunization Practices (ACIP). Advisory Committee on Immunization Practices; Centers for Disease Control and Prevention (CDC). *MMWR Recomm Rep*. 2011 Nov 25;60(RR-7):1-45. <https://www.cdc.gov/mmwr/pdf/rr/rr6007.pdf>

recommendations.

The 1998 recommendations and the draft update are:

1998 Recommendations

- a. Administer mumps vaccine* to all personnel without documented evidence of mumps immunity, unless otherwise contraindicated. **Category IA**
- b. Before vaccinating personnel with mumps vaccine,* do not routinely perform serologic screening for mumps, unless the health care employer considers screening cost-effective or it is requested by the potential vaccinee. **Category IB**

*MMR is the vaccine of choice. If the recipient is known to be immune to one or more of the components, monovalent or bivalent vaccines may be used.

Proposed Update

Delete a. and b.: Narrative will refer to *ACIP 2011 Recommendations for Immunization of Healthcare Personnel* and to HICPAC Core Practices Document.

- **ACIP:** “All persons who work in healthcare facilities should have presumptive evidence of immunity to mumps.”
- **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

- c. Exclude susceptible personnel who are exposed to mumps from duty from the 12th day after the first exposure through the 26th day after the last exposure or, if symptoms develop, until 9 days after the onset of parotitis. **Category IB**

Draft Recommendations

- a. Exclude from work healthcare personnel without presumptive evidence of immunity to mumps who have had an unprotected exposure to mumps from the 12th day after their first exposure through the 25th day after their last exposure.
- b. Exclude from work healthcare personnel with known or suspected mumps until 5 days after the onset of parotitis.

The 1998 recommendation for exclusion for 9 days after the onset of parotitis was updated in 2011 based on a data review about viral shedding and risk of transmission. The proposed draft update aligns HICPAC’s recommendation with ACIP’s recommendation.

The 1998 Guideline did not include a specific recommendation for asymptomatic healthcare personnel with presumptive evidence of immunity who had an unprotected exposure to mumps; the Workgroup drafted the proposed recommendation to mirror the language used in the draft Pertussis section.

Draft Recommendation

- c. Work restrictions are not necessary for asymptomatic healthcare personnel with presumptive evidence of immunity to mumps who have had an unprotected exposure to mumps.

Dr. Babcock presented the proposed draft update to the Rubella section. The Workgroup applied a similar process to updating this section as they did for the Mumps section. As with mumps, the first recommendations in the 1998 guideline are vaccine-specific. These topics are deferred to ACIP in the draft update:

1998 Recommendations

- a. Vaccinate all personnel without documented immunity to rubella with rubella vaccine*.
Category IA
- b. Consult local and state health departments regarding regulations for rubella immunity in health care personnel. **Category IA**
- c. Do not perform serologic screening for rubella before vaccinating personnel with rubella vaccine,* unless the health care employer considers it cost-effective or the potential vaccinee requests it. **Category IB**
- d. Do not administer rubella vaccine* to susceptible personnel who are pregnant or might become pregnant within 3 months of vaccination. **Category IA**
- e. Administer rubella vaccine* in the postpartum period to female personnel not known to be immune. **Category IA**

*MMR is the vaccine of choice. If the recipient is known to be immune to one or more of the components, monovalent or bivalent vaccines may be used.

Proposed Update

Delete a. – e.: Narrative will refer to *ACIP 2011 Recommendations for Immunization of Healthcare Personnel* and to the HICPAC Core Practices Document. 1998 Recommendation b is addressed in Section 1 of the Healthcare Personnel Guideline.

- **ACIP:** “All persons who work in healthcare facilities should have presumptive evidence of immunity to rubella.”
- **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

- f. Exclude susceptible personnel who are exposed to rubella from duty from the seventh day after the first exposure through the 21st day after the last exposure. **Category IB**
- g. Exclude personnel who acquire rubella from duty until 7 days after the beginning of the rash. **Category IB**

Draft Recommendations

- a. Exclude from work healthcare personnel without presumptive evidence of immunity to rubella who have had an unprotected exposure to rubella from the 7th day after their first exposure through the 23rd day after their last exposure.
- b. Exclude from work healthcare personnel with known or suspected rubella until 7 days after the rash appears.

As with the proposed updates to the Pertussis and Mumps sections, a recommendation is added for asymptomatic healthcare personnel.

Draft Recommendation

- c. Work restrictions are not necessary for asymptomatic healthcare personnel with presumptive evidence of immunity to rubella who have had an unprotected exposure to rubella.

In keeping with the standard HICPAC formatting, the draft narrative outline for the Mumps and Rubella sections include:

- Background, including outbreaks
- Prevention of transmission in healthcare settings (clarifying comments are added regarding PPE use for all healthcare personnel, regardless of immunity)
- Transmission
- Exposure definition
- Incubation period
- Clinical presentation (the Rubella section describes serious consequences for pregnant persons)
- Testing and diagnosis
- No postexposure prophylaxis, but additional vaccine may be recommended during outbreaks (refer to ACIP/CDC website)

The Workgroup is currently discussing influenza and other viral respiratory pathogens. This discussion is in its early stages and is likely to be complex. The Workgroup welcomes feedback regarding other issues to consider as they frame and draft updated recommendations.

The Workgroup has discussed commonalities and potential differences in management for influenza and other viral respiratory pathogens, especially the specific testing that is available for other pathogens, and the treatment and postexposure prophylaxis options for influenza. The Workgroup has discussed viral shedding and the factors that may contribute to the risk of viral shedding, either from healthcare personnel to others or from a patient to healthcare personnel:

- timing of shedding in the disease course,
- relationship of shedding to fever and other symptoms
- impact of vaccination on less symptomatic clinical presentations and on viral shedding
- patient factors
- impact of anti-viral treatment
- impact of masking infected persons
- use of PEP

The Workgroup had a helpful call with CDC Influenza SMEs Drs. Tim Uyeki and Jerry Tokars regarding the current state of understanding around some of these issues, the evidence base, and the potential utility of a formal literature review versus a “scoping review” or a “desk review.”

The next steps for the Workgroup are:

- Continue the *S. aureus* data extraction and evaluation, with the goal of drafting recommendations based on the results coming months.
- Finalize the draft updated recommendations and text for the Measles section.
- Continue work on influenza and viral respiratory diseases.
- Begin the process of updating the next pathogen sections for update:
 - Diphtheria,
 - Meningococcal disease, and
 - Varicella.

Discussion Points

Speaking from the state and local public health perspective, ASTHO asked whether the section could include one sentence from the ACIP statement: “All persons who work in healthcare facilities should have presumptive evidence of immunity to mumps. This information should be documented and readily available at the work location.”

Dr. Babcock answered that one of the goals of the Guideline update is not to duplicate recommendations that are provided and maintained by other groups at CDC. The draft narrative does not make that specific statement, but it does refer to the ACIP recommendations. These points are also included in the Core Practices document, and Section 1 of guideline emphasizes the importance of following ACIP recommendations for evidence of immunity and immune status for vaccine preventable diseases. As Section 1 focuses on organization, leadership, and management of an occupational health service, it also describes the importance of ensuring that vaccine records are available and easily accessible. These issues apply to each pathogen in Section 2.

VA added that the 1998 guideline lacks clarity in a few areas, such as what constitutes presumptive evidence of immunity, why it is different for healthcare personnel versus the general population, and when testing should occur.

Dr. Babcock noted that the ACIP guidance provides specific criteria for presumptive evidence of immunity for healthcare personnel for each pathogen, such as receipt of 2 documented doses of vaccine, or serologic testing. The age cutoff for presumptive evidence of immunity no longer applies to healthcare personnel. VA said that the change in age has been confusing.

Dr. Bell appreciated the clear and helpful language in the draft materials and commented that these sections represent “a great start” to a complex document. The Workgroup’s conversations with Drs. Uyeki and Tokars, who are thought leaders in the vaccine preventable disease and respiratory infection world, are notable, as these SMEs are integral to the cross-clearance process at CDC. Their early involvement with the section content and rationale for the proposed draft changes will help the clearance process operate smoothly.

Regarding the respiratory infection section, AEH asked whether recommendations would be drafted for testing of healthcare personnel, particularly given new testing modalities and technology that are now available.

Dr. Babcock replied that the Workgroup is considering whether to draft specific recommendations about testing, and they are grappling with numerous questions: Is it worth testing? What they are looking for, and is it necessary to know? What would be done with the information, and by whom? Who should pay for testing? If a healthcare worker has symptoms, should the symptoms be tied to a work exposure? Should the person be sent to a primary care provider, if he or she has one?

HICPAC noted that a common area of discussion, question, and conflict is how to proceed in the case of a non-febrile respiratory illness with negative test results. This question is particularly important among providers who work with vulnerable populations.

Dr. Babcock agreed and linked this issue to the discussion regarding the use of masking versus work exclusion, and whether special considerations should be put in place for healthcare personnel who work with higher-risk patient populations.

Motion/Vote: Approval of Draft Mumps Recommendations and Narrative

A motion was made for a vote to approve the draft Mumps recommendations and narrative text as presented. The vote carried unanimously, with no opposition and no abstentions. The disposition of the vote was as follows:

- **8 Favored:** Brown, Bryant, Chopra, Diekema, Howell, Maragakis, Patterson, Yokoe
- 0 Opposed: N/A
- 0 Abstained: N/A

Motion/Vote: Approval of Draft Rubella Recommendations and Narrative

A motion was made for a vote to approve the draft Rubella recommendations and narrative text as presented. The vote carried unanimously, with no opposition and no abstentions. The disposition of the vote was as follows:

- **8 Favored:** Brown, Bryant, Chopra, Diekema, Howell, Maragakis, Patterson, Yokoe
- 0 Opposed: N/A
- 0 Abstained: N/A

Updated Recommendations for Tuberculosis Screening and Testing of Healthcare Personnel, United States, 2018

Lynn Sosa, MD, Connecticut Department of Health
Robert Belknap, MD, Denver Public Health
Healthcare Worker Screening Guidelines Working Group

Drs. Sosa and Belknap described progress on a targeted update of the 2005 CDC guidelines on preventing TB transmission in healthcare settings, "[Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Settings, 2005](https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5417a1.htm)," (<https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5417a1.htm>), which include guidance on testing healthcare personnel for TB.

There has been a desire to update this guidance for several years. The issue was amplified by the purified-protein derivative (PPD) shortage in 2012 and 2013, coupled with increasing concerns about the use of interferon- γ release assays (IGRAs) in serial blood testing of low-risk persons. This topic was highlighted at the 2015 National Tuberculosis Controllers Association (NTCA) conference during a joint session with the National Society of Tuberculosis Clinicians (NSTC) and the National Tuberculosis Nurse Coalition (NTNC). A working group to consider updates to these recommendations was formed in the summer of 2015, and the systematic review process began in January 2017.

The 2005 guidelines cover a wide range of recommendations for the prevention of TB transmission in healthcare settings. The working group's review focused specifically on the screening and testing of healthcare personnel, which is addressed in the first part of the guidelines. The Community Guide method was used in the systematic review process to evaluate and summarize the available evidence. Two reviewers independently screened and abstracted data for each included study. Disagreements were resolved by consensus between the two reviewers. Data were analyzed using "metaphor" and "meta" packages in R (v3.3.2).

The literature search included studies that screened or tested healthcare personnel for latent tuberculosis infection (LTBI) indexed in MEDLINE, EMBASE, and Scopus databases. The original search period encompassed January 2006 - February 2017. The search was later updated to include February 2017 - November 2017. Only English language studies were

included. The search applied the following inclusion criteria:

- randomized controlled trials (RCTs),
- quasi-experimental studies,
- observational studies,
- cross-sectional surveys, and
- other designs with concurrent comparison groups.

Articles were excluded if they were:

- case reports,
- editorials,
- commentaries, or
- descriptive articles on nosocomial outbreaks.

The target populations were paid or volunteer healthcare personnel. The outcomes of interest were:

- prevalence, conversion, and reversion rates;
- TB transmission rates; and
- TB disease rates.

The settings included were high-income, low TB-incidence countries. The original search period identified 1129 studies, and the updated search period identified an additional 18 studies. Of these, 84 studies received a full text review. Ultimately, 36 studies were included in the analysis.

To summarize the review findings:

- Approximately 3% of US healthcare personnel tested positive for *M. tuberculosis* at baseline using the tuberculin skin test (TST), while 5% tested positive when tested with Interferon-Gamma Release Assay (IGRA).
- Less than 1% of US healthcare personnel converted from a negative baseline test to positive when using the TST for serial testing. This percentage increased to 4% when tested with IGRA.
- Approximately 62% of US healthcare personnel who tested positive at baseline reverted to a negative test when tested with TST during serial testing, and 48% reverted when tested with IGRA.
- No healthcare personnel developed TB disease in the included studies.
- There was insufficient evidence to assess incidence and transmission of TB disease among US healthcare personnel based on occupational and non-occupational risk.

Limitations of the review included:

- The included studies were highly heterogeneous in population, study design, and type of test used.
- Only 7 of the studies were of good design suitability.
- Most of the studies focused on the TST and QuantiFERON®-TB (QFT), with very few studies including the T-SPOT®.TB test.
- Few of the included studies reported demographic data, and evidence was limited mostly to the hospital setting.

The updated guidelines incorporate updated terms and definitions:

- The term “Healthcare Personnel (HCP)” replaces the term “Healthcare Worker (HCW)” for consistency with current HHS and CDC preferred language.
- The definition of HCP is unchanged from the definition of HCW in the 2005 guideline.

- TB screening is defined as “the broad process that includes a risk assessment, symptom evaluation, a test for LTBI (either a TST or IGRA), and additional work-up for TB disease as needed.”
- TB testing refers to either TST or IGRA, with no preference given to either.

The following table summarizes the 2005 recommendations and how the 2018 draft recommendations differ from them.

Category	2005 Recommendation	2018 Recommendation
Baseline Screening and Testing	On Hire testing of all HCP with IGRA or TST	On Hire testing of all HCP with IGRA or TST (unchanged); include TB risk assessment (new)
Postexposure Screening and Testing	In HCP with baseline negative test, IGRA or TST at time exposure is identified and 8-10 weeks after exposure; symptom assessment for HCP with baseline positive test	In HCP with baseline negative TB test, IGRA or TST at time exposure is identified and 8-10 weeks after exposure; symptom assessment for HCP with baseline positive test (unchanged)
Serial Screening and Testing- Occupational Risk	Based on facility risk assessment and the healthcare setting (inpatient vs outpatient)	Not recommended; can consider for select HCP groups (new)
Serial Screening and Testing- Non-Occupational Risk	Not addressed	Consider periodic (e.g., annual) risk assessment of all HCP (new); testing based on new risk identified (new)
Follow-Up of Positive Test Results	Consider referral for LTBI treatment of HCP diagnosed with LTBI at increased risk for TB progression	Strongly recommend treatment for all HCP diagnosed with LTBI unless contraindications exist (new)

The updated Baseline Screening and Testing recommendation states that baseline testing and screening upon hire should include a TB risk assessment, symptom evaluation, and TST or IGRA, but not both. However, if a person who is considered to be low-risk based on the risk assessment tests positive, he or she should receive a second test to determine a true positive. This recommendation is consistent with current [TB Diagnostic Guidelines](#)

<https://www.ncbi.nlm.nih.gov/pubmed/28052967>).⁶

For postexposure screening and testing, the focus is on known exposure without adequate personal protection in the healthcare setting. Persons with a negative TB test upon hire should have a symptom assessment and TB test at the time the exposure is identified, and should be retested 8 to 10 weeks after the last exposure. Healthcare personnel with a positive TB test upon hire, with or without a history of treatment, should have a symptom assessment, but no test.

For serial screening and testing based on occupational risk, no routine testing of healthcare personnel is recommended at any interval in the absence of a known exposure or ongoing transmission in a specific facility. Healthcare facilities can choose to conduct routine testing of specific groups of healthcare personnel or of personnel in specific settings based on historic risk. These decisions should be individualized to the facility and made in consultation with the state or local health department. For serial screening and testing based on non-occupational risk, it is important to recognize non-occupational exposures to TB and risk factors for TB progression in healthcare personnel. The updated recommendations state that facilities should consider periodic risk assessment of healthcare personnel for TB exposure or new risks for TB progression, such as travel. Decisions to pursue additional testing of healthcare personnel should be based on the worker's individual risk assessment.

Regarding follow-up of positive test results, the work-up for healthcare personnel with a positive TST or IGRA test result should include chest imaging, symptom assessment, and further evaluation for TB disease if needed. All healthcare personnel diagnosed with LTBI should be offered, and encouraged to complete, LTBI treatment, unless a contraindication exists.

The updated guideline is intended to be submitted as a *Morbidity and Mortality Weekly Report (MMWR)* article. Because of the space constraints within the *MMWR*, the working group is developing a companion document to focus on the details of implementation.

Discussion Points

ACOEM had the opportunity to review the document and commended the working group for recognizing that even tests with reasonable sensitivity and specificity applied to an extremely low-risk group will generally result in mostly false-positives. Therefore, it makes sense to eliminate testing when data have shown that healthcare personnel have lower rates of TB than the general population, and foreign-born healthcare personnel have lower TB rates than the foreign-born population.

ACOEM expressed grave concern about the individualized risk assessment with respect to non-occupational risk factors. The non-occupational risk factors consist of protected health information that is potentially socially stigmatizing, and that has not been collected in medical center workplaces for the purpose of enrolling people into a mandatory screening program. Administering such a program requires significant communication with supervisory staff, as a screening requirement for only certain persons is different from a screening requirement for everyone. If only a subset of staff are subjected to TB screening, supervisors will know that this

⁶ Lewinsohn DM, Leonard MK, LoBue PA, et al. Official American Thoracic Society/Infectious Diseases Society of America/Centers for Disease Control and Prevention Clinical Practice Guidelines: Diagnosis of Tuberculosis in Adults and Children. *Clin Infect Dis*. 2017 Jan 15;64(2):111-115.

requirement is because they are foreign-born, have HIV, have traveled to their country of origin, or because of other socially stigmatizing information that would be part of a non-occupational risk assessment. Legally, this scenario presents a quagmire. Beyond the legal issues, it would be extremely difficult to implement this recommendation. Risks will shift year by year across a large population of healthcare personnel, depending upon their non-occupational activities. It is important to remember that the premise behind screening healthcare personnel in the first place is based on the consideration of healthcare personnel as a higher-risk group for TB; however, they are not a higher-risk group. If taxi drivers, school teachers, daycare workers, and other working people are not being screened for non-occupational risk for TB, ACOEM suggested not screening healthcare personnel either. Instead, the focus should be on occupational risk in order to acquire baseline information, as recommended in the document, and on performing careful follow-up in cases of unprotected exposures and where pockets of occupational risk are believed to exist, such as in emergency departments (EDs) and among pulmonologists. These draft recommendations were presented to a group of 60 directors of medical center occupational health programs from across the US at the ACOEM meeting in April 2018. That group also expressed grave concern about the legal implications of trying to collect that type of information in order to enroll personnel into a mandatory screening program. The response from that group was a resounding preference to continue screening the entire healthcare personnel population rather than to try to determine on a yearly basis which individuals have non-occupational risks.

Dr. Belknap responded that the working group agrees that these issues must be given careful thought. They also have heard opposite concerns from some institutions with individuals who are believed to be at higher risk. Stopping screening them could be potentially problematic as well. It is important to recognize that testing all healthcare personnel could put them at risk because of the potential for high rates of false positives among a low-risk group, and then subjecting them to unnecessary, toxic treatment. The initial premise of the recommendation was based on the working group's belief that the original aim of serial testing was not being achieved and may be placing people at risk. This recommendation was titled "Non-Occupational Risk," but in reality, some of the risk is probably a combination of occupational and non-occupational. Many academic institutions and other facilities have personnel who work internationally for research or clinical purposes, which is arguably occupational risk, though not a US facility-based risk. The working group tried to incorporate an assessment that allows for more appropriate, targeted serial testing of individuals. The group believes that the risk assessment is important at baseline as well for interpretation of the test. None of the tests are useful if a person's risk is unknown. The CDC Diagnostic Guidelines state that if a person has low risk for exposure and a positive IGRA test, a second test of some type should be performed to confirm infection; this recommendation holds true for baseline testing of individuals entering the healthcare workforce as well. Though acquiring information about a person's risk has not been done in the past, it probably should be. The working group agrees that the risk of healthcare personnel having unrecognized exposure and infection from working in US healthcare facilities is exceedingly rare. The other reason to screen healthcare personnel for TB is to protect patients and co-workers, given the risks associated with developing active TB. Such cases have occurred in the last 5 to 10 years, and the working group is determining how to minimize them. Another criticism of the 2005 guideline is that it offers little flexibility. The original authors hoped to provide flexibility for facilities to target at-risk populations, but the guideline has not been interpreted or implemented that way. The 2018 update is written such that the recommendations are intended to be flexible. The working group is considering how to put forward the updated recommendation regarding performing an optional risk assessment for other non-occupational risks while maintaining the privacy of individuals. This issue can be addressed in the companion document.

ACOEM agreed with these points and recognized the features of occupational activity, such as assignment to work in a clinical setting in a country with much higher rates of TB, or in US settings such as the emergency department with “pockets” of higher occupational risk, that need to be assessed on an annual basis. The concern with the truly non-occupational risk, which includes socially stigmatizing and protected health information, is that if a facility is administering what is essentially a mandatory surveillance program, and management is aware of the reasons that individuals would be enrolled in it, they would be privy to information that is not generally regarded as appropriate to share with them. To reiterate, healthcare personnel are not considered to be at increased risk for TB beyond the special circumstances described, and there is no precedent for screening in other occupations for non-occupational risks based on what country they are from, what disease they may have, what zip code they live in, what wage they make, etc.

Dr. Belknap said that healthcare personnel often work with individuals who are known to be immunocompromised, so the risk to them is quantifiable, as opposed to the risk of getting in a taxi or going to a restaurant. When caring for patients, there is an obligation to minimize risk. Healthcare personnel are screened for two reasons: one is to identify unrecognized infection that presumably came from contact with a patient, which is the risk that is thought to be non-existent. The other reason is to protect patients from exposure to TB, which is the rationale for an assessment. It is worth discussing further how an assessment would be administered, and shared or not shared with supervisors, so that the recommendation is implemented in a manner that does not compromise an individual’s privacy.

HICPAC echoed the concerns raised by ACOEM and was generally in favor of decreasing the amount of screening required. It is not clear why the risk assessment includes changes in risks of TB progression. Personal healthcare information (PHI) can be assessed in a treatment decision conversation when healthcare personnel are identified to have infection when they are screened upon hire. A system that allows individuals to self-identify if they have traveled to a high-risk place and to express interest in screening does not seem unreasonable; however, the benefit of assessing increased risk of TB progression is not clear and causes concern. It is also important to recognize that managers and supervisors are the “enforcers” of most mandatory programs. If healthcare personnel must be tested if they have an increased risk of progression, managers and supervisors will have to know in order to schedule the testing.

HICPAC acknowledged that healthcare personnel are different from other occupations because of potential risk to patients, as Dr. Belknap described. Questions will arise regarding the details of implementation. Providing an accompanying example of a risk assessment, or further fleshing out the details to identify which risk factors, which populations, etc., would be beneficial. Otherwise, facilities could move from annual testing of all personnel to a “free-for-all” of interpreting risk.

Dr. Sosa reiterated that the working group is developing a companion document in recognition of the potential issues associated with implementation. The recommendations will be straightforward and brief, but will not provide information about “what to do and how to do it.” The companion document will include examples of what some facilities might already be doing, including risk assessment. The TB community uses a risk assessment, based on a tool developed by California, that is brief and to the point. TB screening is not new to healthcare facilities, so the working group anticipates that many helpful examples could be incorporated into the companion document. The working group purposely used the word “consider” in the non-occupational risk category. They thought that many healthcare facilities would not conduct an annual risk assessment of their healthcare personnel because they may not necessarily

have personnel who are at risk. This recommendation came from others in occupational health who thought that the risk assessment would be helpful for larger facilities.

HICPAC observed that for a Chief Quality Officer in a city TB clinic, for example, these recommendations would be impossible to implement because of many of the concerns expressed during the discussion.

HICPAC commented on the substantial variation in state-level privacy laws regarding information that would be requested in any reasonable TB risk assessment and asked if the working group considered whether it would be possible to implement risk assessments in all 50 states.

HICPAC appreciated the use of the word “consider” in the recommendations and the flexibility that it provides, but many facilities will implement all of the recommendations. If assessing new risks of TB progression annually is included as a “consider” recommendation, some facilities will do it. The value of conducting this assessment is unclear: even considering it does not seem useful.

AEH pointed out that often, the infection preventionist (IP) in a facility is also responsible for occupational health. It can be challenging to help them understand the risk of TB for employees as opposed to patients. These recommendations might be too difficult to implement for a “dual-hatted person” who may be the only occupational health and IP staff member.

Dr. Belknap recognized that implementation has been one of the most difficult topics for the working group, and he appreciated the feedback. The data do not support that the risk among healthcare personnel is the same as the risk in the general population. Based on the epidemiology, the working group believes that serial screening places healthcare personnel at risk, with little to no benefit from a TB prevention perspective. The working group wants to provide the ability, and reassurance, to stop performing that testing. A subgroup of the working group includes representatives from occupational health to help think through the issues of how the guidelines might be implemented. One example could be a tool as simple as a one-question survey asking about known TB exposures. For most institutions, people will overwhelmingly answer “no” to the assessment. This step would eliminate 95% or more of unnecessary annual testing, leaving only the few who perhaps should be retested. There may be other examples of risk of progression for which a facility would need to know that a person has an important health issue, such as a post-transplant worker who should not work with patients with certain conditions, or who should be restricted in other ways.

ACOEM observed that receipt of influenza vaccine is increasingly enforced across populations of workers in medical centers. An annual screening program cannot be implemented without enforcing it. It cannot be made optional, because supervisors send staff for screening, which makes them aware that someone is being screened for a reason, such as being HIV-positive. If an employee who is supposed to be screened does not present for screening, the supervisor would be in the position of confronting that employee for not complying with a work requirement. The legal implications of this scenario are problematic.

HICPAC pointed out that employees voluntarily disclose health conditions that may affect their ability to care for specific patients. Facilities should not conduct large surveys to collect complete health information on employees. It is incumbent on the employee to divulge issues that may impact their health so that the facility can better protect them.

Dr. Belknap clarified that the working group does not suggest a list of risks for workers to check

off. The performance of the tests are no better in terms of risk of progression, so the working group can consider removing the consideration of asking about other risks for progression. However, some healthcare personnel may want this screening. The goal is to make it easy for workers to identify whether screening is something that they want, but it does not seem like they necessarily would have to disclose why they are at risk.

Regarding the discussion of facility risk assessment, Dr. Sosa stressed that the goal is to shift emphasis to the individual person, and especially to emphasize the need for treatment when TB infection is diagnosed in healthcare personnel. The working group recognizes that some occupational health programs treat their employees when they are diagnosed, but many screen, inform the worker, and refer them for treatment. Treatment is necessary to prevent TB transmission in healthcare facilities. Focusing on facility risks is no longer helpful, so the working group wants to emphasize the importance of identifying and treating the right people in order to decrease transmission in a facility.

Dr. Bell commended the working group for its focus on reducing unnecessary or inappropriate testing. He added that the critical assessment of the value and efficacy of the test itself is timely. He remained concerned about several issues. If a simple check-box is used to ask an employee about risk factors, the vast majority of healthcare personnel, whether they work in large or small facilities, will not understand it because they are not trained in immunology or infectious disease. Thus, the idea is not realistic and warrants further consideration. The frequency of healthcare personnel who are inherently high risk because of who or what they are leading to infection and transmission in healthcare settings is unclear. Dr. Bell wondered whether this issue may be theoretical and may make sense “on paper,” but not make sense in the real-world setting of a healthcare system where risk is low. It is not clear that a concrete recommendation should be made in this area.

SHEA agreed with Dr. Bell’s observations and emphasized that the privacy issue should not be discounted. Someone with HIV should be in care with an HIV provider. HIV care includes an annual discussion about TB and getting TB testing. Follow-up mechanisms are therefore already in place. Moreover, it is not easy to decide what treatment to give an HIV-positive patient who tests positive for TB because there are many factors to consider, such as their antiretroviral regimen. Workers are not required to divulge their HIV status, and asking them to do so may ask them to divulge a private issue that has nothing to do with their ability to do their job. The guideline could state that facilities should distribute information specifying that healthcare personnel with medical issues should follow up with their personal providers to discuss whether additional testing is needed. Occupational health departments should not have to take on HIV testing, for example, for employees when the testing is not related to their jobs. SHEA further agreed that the incidence of the risk of progression from latent to active TB, and of transmission to other staff and patients, seems very low. It has been a long time since the transmission and outbreaks in New York City in the 1990s, and they seem uncommon at this time, which points to the importance of reminding all healthcare personnel, not just certain risk groups, annually about the signs and symptoms of TB.

Dr. Belknap found the feedback helpful. It may suggest that the working group needs to shift focus to annual education on recognizing TB and understanding risks to healthcare personnel and their patients. It may be perceived that annual testing equals education, but mandating people to get a test every year does not mean that they are aware of, and educated about, TB. Perhaps an educational recommendation including examples could be included.

AEH agreed, but expressed concern that with the elimination of screening, early detection and

prevention could be lost.

Dr. Belknap replied that there is not good evidence to suggest that an annual requirement for testing identifies individuals with TB faster. People ultimately are diagnosed based on symptoms separately from annual testing. In terms of how often transmission occurs, TB overall is relatively uncommon in the US. Approximately 9000 patients in the US were diagnosed with TB in 2017. Every year in several states, there are cases of a healthcare worker with active TB exposing patients, families, and co-workers. Those who work in the TB field hear about these cases, and they may be covered by the local news, but rarely by national news outlets.

Healthcare-Associated Infection Vaccines

Anthony Fiore, MD, MPhD, MS
Chief, Epidemiologic Research and Innovations Branch
Division of Healthcare Quality Promotion
National Center for Emerging and Zoonotic Infectious Diseases
Centers for Disease Control and Prevention

During this session, Dr. Fiore discussed the potential role and impact of vaccines in the prevention of HAIs and reducing the risk of AR; specific vaccines undergoing later phase (IIb - III) human trials (*S. aureus*, *C. difficile*, selected others in Phase I or IIa); ongoing and potential CDC and public health contributions to HAI vaccine development, evaluation, program implementation; and potential roles for HICPAC and ACIP in this work.

Several advisory committees have released recommendations regarding vaccines for HAIs:

- TATFAR 2014:
 - “Develop a transatlantic strategy to facilitate vaccine development for HAIs”
- National Vaccine Advisory Committee (NVAC) 2016:
 - “...incentives proposed to stimulate antibiotic development must also be evaluated for their utility to accelerate the development of vaccines...”
- Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria (PACCARB) Vaccine Incentives Workgroup Report, 2017:
 - “Provide additional funding for the development of new product pipelines for vaccines that prevent viral or bacterial syndromes that drive antibiotic use”
 - “Optimize the interactions among sponsors, regulatory agencies (such as FDA), and use policy committees (e.g., the ACIP)”
 - “Incentivize the uptake of vaccines by influencing behavior, such as reimbursement to ensure ‘first-dollar coverage’”

A paper from Lipsitch and Siber described some of the many potential effects HAI vaccines might have.⁷ At best, vaccines play only an accessory role to prevention. Emphasis will continue to be focused on infection control and antibiotic stewardship; however, every infection cannot be prevented with infection control and antibiotic stewardship alone. Vaccines are a proven successful strategy for primary prevention of infection, and they are effective regardless of mechanism or prevalence of antibiotic resistance. For example, a vaccine directed against *Pseudomonas* would presumably be effective regardless of how resistant that organism is.

⁷ Lipsitch M, Siber GR. How Can Vaccines Contribute to Solving the Antimicrobial Resistance Problem? *MBio*. 2016 Jun 7;7(3).

The Lipsitch paper makes interesting points about the potential indirect effects of HAI vaccines, including the potential for reducing inappropriate antibiotic use by reducing the need for empiric use of broad-spectrum antibiotics aimed at highly resistant HAI strains. It is especially interesting to think about the impact of vaccines directed not just against HAIs, but also against major drivers of antibiotic use: influenza, respiratory syncytial virus (RSV), Group B *Streptococcus*. There is potential to reduce transmission risk in healthcare settings and in the community, perhaps similar to the indirect disease prevention observed with pneumococcal vaccines, in which targeted vaccine programs have had an impact on older adults even though they themselves are not getting vaccinated. This impact is the result of reducing carriage within the community. There is potential for vaccines to reduce the transmission of resistance mechanisms, such as the exchange of resistance elements among pathogens and by reducing the risk of bystander resistance in normal human flora.

Of course, many technical challenges must be overcome in HAI vaccine development. Natural infection typically does not protect against subsequent infection for most HAIs. Because there is often no established immune correlate of protection, demonstrating that antibody response has been engendered might not be sufficient because it might not be protective. Animal models have not been predictive through several previous attempts at vaccine development for pathogens such as *S. aureus*. There is a need to elicit a protective response against multiple antigens, given that toxins can be quite complex. For example, human trials for *C. difficile* will require the recruitment of large, at-risk populations because *C. difficile* is a common HAI, but it is not common in the general population. Preventing colonization could be an important part of protection, but may not be part of direct protection: preventing colonization is an order of magnitude more difficult for vaccines.

A recently-licensed human monoclonal antibody, bezlotoxumab (ZINPLAVA™; Merck), is available for the prevention of recurrent *C. difficile*, providing some evidence that protective immunity can be engendered against *C. difficile*. ZINPLAVA™ was approved in 2017 for the prevention of recurrent infection, for which the risk among adult patients is typically about 20%. ZINPLAVA™ is administered as a single IV dose during treatment, has a half-life of 19 days, binds to *C. difficile* toxin B, and has no impact on the initial clinical cure. The cost is fairly expensive, at \$3800 per dose. A Merck-sponsored economic study suggested that 0.12 quality-adjusted life-years (QALYs) were gained for each dose given. The trial data showed a reduced risk of recurrence of 38% at 12 weeks post-administration. Kinetics suggest that there could be some protection for up to 6 months. This partial protection provides some optimism that protective immunity against CDI is possible. Other monoclonals directed against *C. difficile* are in the development phase, as well as a number of others on [ClinicalTrials.gov](https://clinicaltrials.gov/) (<https://clinicaltrials.gov/>) directed against *S. aureus* and *Pseudomonas*.

Another vaccine, *Cdiffense* (Sanofi), looked promising in its initial development phases. This purified full-length toxin A and B, formalin inactivated, alum adjuvant vaccine was immunogenic in health volunteers. However, the vaccine showed low efficacy in the Phase IIb/III trial, and development was discontinued in late 2017.

Pfizer is moving forward with a slightly different *C. difficile* vaccine, building on the concept that neutralizing antibodies against toxins reduce the risk of recurrent *C. difficile* infection. The Phase III study is underway on this bivalent recombinant vaccine, which is directed against toxins A and B. It is genetically engineered and detoxified, and alum adjuvanted. It induces high levels of neutralizing antibodies when given, neutralizing toxins from >95% of clinically relevant *C. difficile* strains globally. Good immunogenicity was demonstrated with a 0/1/6-month schedule in the Phase II study in humans, and it has been well-tolerated. Enrollment of 16,000

is planned for Phase III, and the outcomes of safety, tolerability, and efficacy will be assessed in adults ≥ 50 years of age. To be enrolled, subjects have to have had a healthcare exposure, which is broadly defined for the trial, or have received a systemic antibiotic at any time in the previous 12 weeks. Based on the clinical development timeline provided by Pfizer, the results of this trial are not expected for at least a year or two, which optimistically would put licensure in 2020 to 2021, if the trial is successful.

Dr. Fiore described previous investigational *S. aureus* vaccines. StaphVAX (Nabi) was directed against the two most common capsular polysaccharides, CP5 and CP8. It was conjugated to non-toxic recombinant *Pseudomonas aeruginosa* (*P. aeruginosa*) exotoxin A. It was protective in animal challenge models and was immunogenic in healthy volunteers. In the Phase IIb/III trial in patients with end-stage renal disease, it demonstrated safety, but low efficacy. Therefore, development was discontinued.

The V710 (Merck) vaccine directed at iron surface determinant B (IsdB) was protective in animal challenge models and was immunogenic in healthy volunteers; however, the Phase IIb/III trial in cardiothoracic surgery patients showed low efficacy and a small increase in mortality among patients who developed *S. aureus* infections who had been vaccinated. The causality of that outcome has not been fully explained. Development of this vaccine was discontinued as well.

SA4Ag (Pfizer) is an investigational *S. aureus* vaccine in Phase III studies with the following highly conserved antigens:

- Capsular polysaccharides CP5 and CP8 conjugated to the carrier protein CRM197, which has been used in other vaccines that are currently licensed
- Mutated recombinant clumping factor A (rmClfA, lacks plasma fibrinogen-binding activity)
- Manganese transporter protein C (MntC).

This investigational vaccine has shown rapid, robust humoral immune response lasting >6 months, but it has not yet been shown to reduce colonization. This vaccine may behave differently from previous, failed *S. aureus* vaccines for a few reasons:

- It has 3 different antigens,
- The target population is healthier, and
- Opsonophagocytic bacterial killing responses have been shown.

Based on the timeline provided by Pfizer, this vaccine is currently being assessed in a Phase IIb/III trial, with a planned enrollment of 6000. This trial will assess safety and efficacy in adults having elective open posterior spinal fusion procedures with multilevel instrumentation. Pfizer met with the FDA's Vaccines and Related Biological Products Advisory Committee (VRBPAC) in November 2017, at which time Pfizer requested consideration of an expanded indication for SA4Ag to other elective orthopedic surgeries if it is shown efficacious in spinal fusion. The FDA has not yet responded to this request, and probably will not until the results of the trial are available.

Other examples of investigational HAI vaccines under development of potential interest to HICPAC, though "much further back in the pipeline," include:

Vaccine or Biologic	Target	HAI(s)
NVD3a (NovaDigm)	<i>Candida</i> agglutinin and <i>S. aureus</i> adhesion protein	Vulvovaginal candidiasis SSI
VLA84 (Valneva)	<i>C. difficile</i>	Primary prevention

Vaccine or Biologic	Target	HAI(s)
ExPEC4V (Janssen / Glycovaxyn)	<i>E. coli</i> O antigens (4)	Extraintestinal <i>E. coli</i> infection
Nontoxigenic <i>C. difficile</i> (NTCD-M3)	<i>C. difficile</i>	Recurrence prevention

CDC and public health have a role in vaccine development. In addition to technical challenges, significant programmatic challenges presented by HAI vaccines must be considered. These programmatic challenges represent one of the drivers behind why CDC is raising these issues an early phase, several years before a vaccine is potentially licensed.

Delivery models for vaccines are typically based on universal, age-based vaccination recommendations. For example, everyone over 50 years of age is recommended to receive zoster vaccine. However, the approved indications for HAI vaccines will probably be quite narrow (e.g., elective orthopedic surgery, post-antibiotic, limited age group, chronic disease risk factors, etc.). Therefore, vaccination programs will rely on settings that are less experienced with delivering vaccinations, such as outpatient surgery facilities, or in care transitions. Immunogenicity might be reduced among persons at risk for these diseases, and there is an unknown potential for interaction between other treatments and vaccines. Economic analyses will also be important.

Some of CDC’s ongoing efforts could be leveraged to examine vaccination issues, including expansion of HAI research, evaluation, and infrastructure support in states. The CDC Prevention Epicenters Program could identify risk factors, and the EIP is another research platform that could be leveraged. Other resources include the CDC & FDA Antibiotic Resistance Isolate Bank and the recent increase in laboratory capacity in states that Epidemiology and Laboratory Capacity (ELC) for Infectious Diseases Cooperative Agreement has funded, which has allowed CDC to have increased access to different pathogens. The AR Isolate Bank has assembled these pathogens into panels that could potentially be useful for vaccine development. These panels are available to researchers.

A number of epidemiologic studies could be conducted using CDC’s research platforms, particularly on disease burden and risk factors. CDC is excited about the possibility of linking various data sources so that patients can be followed across healthcare encounters. This work could help identify access points for people who are candidates for vaccine, and to get a sense of the types of healthcare exposures they have had before they develop a high risk of acquiring an HAI. Modeling studies can be used to model the potential impacts for:

- Transmission,
- AU,
- The development of implementation strategies,
- Informing trial design, and
- Considering costs.

Typical vaccine program evaluation components, including post-licensure effectiveness, safety, coverage, and economic impact, are “bread and butter” to CDC, including the Immunization Safety Office (ISO), which is part of DHQP and an integral part of ACIP’s discussions.

A modeling study by James Baggs and colleagues illustrates the possibilities of modeling.⁸ The study developed a risk score for a person with CDI, and then showed that a risk score over a certain amount puts individuals at much higher risk. The study then assessed how many individuals are in those risk categories. This approach could be used for vaccine study planners to determine whether they should focus on people at very high risk, or if a somewhat lower-risk population should be included.

Another potentially important CDC tool in this work is NHSN. As a comprehensive population-based surveillance system that receives reports of laboratory-confirmed infections from over 17,000 healthcare facilities on 10 to 20 million persons nationwide, NHSN could be used to assess the impact of vaccine programs.

At the ACIP meeting in February 2018, the establishment of an ACIP HAI Vaccine Workgroup was proposed. With the plan for vaccine licensure in 2020 or later, this Workgroup would advise CDC on how HAI vaccines could be used. The HAI Vaccine Workgroup would be supplemented by external HAI experts, including HICPAC member(s) and affiliates. The group is anticipated to begin work in Fall 2018.

Dr. Fiore invited questions and thoughts regarding the role that HICPAC might play in this work in the future, given the potential of these vaccines reaching the market in 2 to 3 years.

Discussion Points

SIS pointed out that surgeons' concern about *C. difficile* typically surrounds operations to remove a patient's colon, and the hope for a better way to prevent it. *S. aureus* is the most common infection of concern to surgeons, but for this audience, it might be helpful to disconnect the AMR component from the HAI vaccine effort. If an average "rank-and-file" community orthopedic surgeon is told that there is a vaccine to prevent MRSA, they may not be interested, because they have not seen an MRSA infection in 5 to 10 years. However, if they are told that this vaccine could potentially reduce their SSIs from all causes, they may be more enthusiastic. Thus, the AMR piece may not be a good selling point for these potentially very useful vaccines.

AEH expressed concern about cost and asked how these vaccines might be implemented, whether cost would be covered by insurance, and what the protocol might be for the uninsured.

Dr. Fiore posited that Medicare would cover the cost for patients aged 65 years and over, as they do for ACIP-recommended vaccines. For insured persons aged less than 65 years, insurance companies often follow ACIP recommendations, though they may lag somewhat behind Medicare. More consideration will have to be given to uninsured adults. There is not an equivalent vaccine platform for adults to the Vaccines For Children (VFC) program, which guarantees coverage. The lack of a similar adult platform has been pointed out as a gap with regard to all adult vaccines.

Dr. Bell said that CDC is in the process of considering how best to engage with the 2 different advisory committees of ACIP and HICPAC. ACIP clearly welcomes HICPAC's participation as a "cousin" committee, but there also may be ways to share a Workgroup, or other useful mechanisms for collaboration. They must first determine what is permissible by law under the

⁸ Baggs J, Yousey-Hindes K, Ashley ED, et al. Identification of population at risk for future *Clostridium difficile* infection following hospital discharge to be targeted for vaccine trials. *Vaccine*. 2015 Nov 17;33(46):6241-9.

Federal Advisory Committee Act (FACA), given that HICPAC and ACIP are both FACA-charted committees.

Dr. Cardo added that when Dr. Fiore presented to ACIP, the interesting concern expressed was that the nation's current delivery mechanisms for vaccines differ significantly from the mechanisms that will be needed for HAI vaccines. A critical area for HICPAC's engagement will be to ensure that programs are informed about the progress of HAI vaccine development so that they are prepared for the promotion and delivery of HAI vaccines, when the time comes. Further, it would be helpful to hear input on how to connect the state AR/HAI programs that CDC funds and programs that promote implementation of vaccine at the health department level. CDC prefers to begin work on these questions and issues immediately so that when HAI vaccines become available, the delivery infrastructure will already be in place.

Public Comment

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

Dr. Kavanagh addressed the issue of cost, noting his belief that our healthcare system is "broken" and too expensive. He does not feel that implementing the highest quality protocols or recommendations can be delayed based upon cost because of the broken system that needs to be fixed.

Dr. Kavanagh also addressed the issue of testing healthcare workers for TB. The importance of TB cannot be overestimated. In many areas, completely resistant TB is emerging. It would be a disaster for our institutions in this country. It is important to be careful and vigilant regarding this dangerous organism now that it virtually cannot be treated. He does not feel that asking everyone to undergo physical or healthcare questions is discriminatory and does not feel that recording their answers and acting upon them is discriminatory. For instance, in the airline industry, pilots are held to high standards with rigorous exams. They must pass those exams in order to fly. Comparing the healthcare industry to other lay professions, such as taxi drivers, is not correct, because healthcare professionals deal with the weakest and most vulnerable populations. Dr. Kavanagh believes, therefore, in holding them to the highest standard, and was disappointed in the stance that healthcare centers are taking, as the primary responsibility is to the patient.

Dr. Kavanagh encouraged a focus on MRSA, and believes that healthcare workers should be tested for MRSA and for other dangerous pathogens. The risks to patients are real, and there is also risk to the healthcare worker. He recalled the recent PACCARB meeting, which included a discussion of "literally crop-dusting diseased plants with streptomycin," which he found amazing. One of the questions from a prominent infectious disease doctor was, "Are we testing these field workers for resistant organisms?" This issue led him to think about testing healthcare workers. Certainly, MRSA is endemic. Approaches for outbreak control should not be used to address problems that are endemic. Similar to the Netherlands and Northern Europe, Dr. Kavanagh feels that the US needs increased surveillance. He does not feel that making recommendations with "consider" or "may" are effective, as those recommendations tend not to get enacted. He suggested making the recommendations mandatory. It would be valid to state that a facility can choose either to test all workers, or those at high risk. Facilities can decide and find a way to test high-risk workers through an annual examination similar to what is done on a flight exam for airline pilots.

In closing, Dr. Kavanagh stated that the primary concern should be the patient and not the healthcare system, because the healthcare system exists for patients.

Summary and Work Plan

Dr. Diekema acknowledged the excellent work that was presented during the meeting and emphasized the great deal of work that remains to be done, including:

- Continuation of the work on the NICU and HCP guidelines;
- Ongoing work for the NHSN Workgroup and its subgroups; and
- Continuation of the work being done by the Products and Practices Workgroup.

The guideline recommendation categorization that HICPAC voted on during a prior meeting is soon to be published in the *Federal Register* for public comment, and HICPAC will return to it after the comment period closes. Dr. Diekema expressed gratitude to HICPAC members, *ex officios*, liaison representatives, and CDC colleagues for their hard work and contributions to this committee. Dr. Yokoe added special thanks to CDC staff Koo-Whang Chung, Kendra Cox, and Erin Stone for their support.

Adjourn

With no additional comments or questions posed, the meeting was adjourned at 11:37 am.

Certification

I hereby certify that, to the best of my knowledge and ability, the foregoing summary of the May 17-18, 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 Used in this Document

Acronym	Expansion
ACIP	Advisory Committee on Immunization Practices
ACOEM	American College of Occupational and Environmental Medicine
ACS	American College of Surgeons
AEH	America's Essential Hospitals
AER	Automatic Endoscope Reprocessor
AHRQ	Agency for Healthcare Research and Quality
AMMI Canada	Association of Medical Microbiology and Infectious Disease Canada
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	Antibiotic Resistance Laboratory Network
ARLN	Antibiotic Resistance Laboratory Network
ARM	Adjusted Ranking Metric
ASPR	Assistant Secretary for Preparedness and Response
ASTHO	Association of State and Territorial Health Officials
AUR	Antimicrobial Use and Resistance Module
BAA	Broad Agency Announcement
BARDA	Biomedical Advanced Research and Development Authority
BSI	Bloodstream Infection
<i>C. auris</i>	<i>Candida auris</i>
<i>C. difficile</i>	<i>Clostridium difficile</i>
CARB	Combating Antibiotic-Resistant Bacteria
CAUTI	Catheter-Associated Urinary Tract Infection
C-CDA	Consolidated Clinical Document Architecture
CDC	Centers for Disease Control and Prevention
CDDEP	Center for Disease Dynamics, Economics, and Policy
CDI	<i>Clostridium difficile</i> Infection
CLABSI	Central Line-Associated Bloodstream Infection
CMS	Centers for Medicare and Medicaid Services
CORHA	Council for Outbreak Response: Healthcare-Associated Infections and Antibiotic-Resistant Pathogens
CR	<i>Consumer Reports</i>
CRE	Carbapenem-Resistant <i>Enterobacteriaceae</i>
CRPA	Carbapenem-Resistant <i>Pseudomonas aeruginosa</i>
CSTE	Council of State and Territorial Epidemiologists
CU	Consumers Union
CUSP	Comprehensive Unit-based Safety Program
DFO	Designated Federal Official
DHQP	Division of Healthcare Quality Promotion
DOE	Day of Event
<i>E. coli</i>	<i>Escherichia Coli</i>
EHR	Electronic Health Record
EIA	Enzyme Immuno-Assays
EIP	Emerging Infections Program

Acronym	Expansion
ELC	Epidemiology and Laboratory Capacity (for Infectious Diseases Cooperative Agreement)
EPA	Environmental Health Protection Agency
ETL	Extract Transform Load
FACA	Federal Advisory Committee Act
FDA	(United States) Food and Drug Administration
FOA	Funding Opportunity Announcement
FOIA	Freedom of Information Act
FORHP	Federal Office of Rural Health Policy
FY	Fiscal Year
GDH	Glutamate Dehydrogenase
GI	Gastrointestinal
HAI	Healthcare-Associated Infection
HCP	Healthcare Personnel
HCW	Healthcare Worker
HHS	(United States Department of) Health and Human Services
HICPAC	Healthcare Infection Control Practices Advisory Committee
HIIN	Hospital Improvement Innovation Network
HOB	Hospital-Onset Bacteremia
HRSA	Health Resources and Services Administration
ICAR	Infection Control Assessment and Response
ICD	International Classification of Diseases
<i>ICHE</i>	<i>Infection Control and Hospital Epidemiology</i>
ICU	Intensive Care Unit
IDSA	Infectious Diseases Society of America
IGRA	Interferon-Gamma Release Assay
IP	Infection Preventionist
IPPS	Inpatient Prospective Payment Systems
IsdB	Iron Surface Determinant B
ISO	Immunization Safety Office
IT	Information Technology
IWP	Infection Window Period
<i>JHM</i>	<i>Journal of Hospital Medicine</i>
KPC	<i>Klebsiella pneumoniae</i> Carbapenemase
LabID	Laboratory-Identified Event Reporting
LEAP	Leadership In Epidemiology, Antimicrobial Stewardship, and Public Health
LOS	Late-Onset Sepsis
LTBI	Latent Tuberculosis Infection
LTCF	Long-Term Care Facility
MDR-GNB	Multidrug-Resistant Gram Negative Bacilli
MDRO	Multidrug-Resistant Organism
MInD-Healthcare	Modeling Infectious Diseases in Healthcare
<i>MMWR</i>	<i>Morbidity and Mortality Weekly Report</i>
MntC	Manganese transporter protein C
MRSA	Methicillin-Resistant <i>Staphylococcus aureus</i>
MSSA	Methicillin-Susceptible <i>Staphylococcus aureus</i>
NAAT	Nucleic Acid Amplification Test
NACCHO	National Association of County and City Health Officials

Acronym	Expansion
NCEZID	National Center for Emerging and Zoonotic Infectious Diseases
NDM	New Delhi metallo-beta-lactamase
NHS	(United Kingdom) National Health Service
NHSN	National Healthcare Safety Network
NICE Network	Nursing Infection Control Education Network
NICU	Neonatal Intensive Care Unit
NIH	National Institutes of Health
NIOSH	National Institute for Occupational Safety and Health
NQF	National Quality Forum
NQMC	National Quality Measures Clearinghouse™
NSQIP®	National Surgical Quality Improvement Program®
NSTC	National Society of Tuberculosis Clinicians
NTCA	National Tuberculosis Controllers Association
NTNC	National Tuberculosis Nurse Coalition
NVAC	National Vaccine Advisory Committee
OR	Operating Room
ORTP	(SHAE) Outbreak Response Training Program
<i>P. aeruginosa</i>	<i>Pseudomonas Aeruginosa</i>
PACCARB	Presidential Advisory Council on Combating Antibiotic Resistant Bacteria
PCR	Polymerase Chain Reaction
PEG	Percutaneous Endoscopic Gastrostomy
PEP	Post-Exposure Prophylaxis
PGHD	Patient-Generated Health Data
PHAC	Public Health Agency of Canada
PIDS	Pediatric Infectious Disease Society
PMA	Premarket Approval
POA	Present on Admission
PPD	Purified-Protein Derivative
PPE	Personal Protective Equipment
PSAN	Patient Safety Action Network
QALY	Quality Adjusted Life Year
QFT	QuantiFERON®-TB
QIO	Quality Improvement Organization
RCT	Randomized Controlled Trial
rmClfA	Mutated Recombinant Clumping Factor A
RSV	Respiratory Syncytial Virus
<i>S. aureus</i>	<i>Staphylococcus aureus</i>
SAAR	Antimicrobial Administration Ratio
SCCM	Society of Critical Care Medicine
SHARPS	Sharing Antimicrobial Reports for Pediatric Stewardship Collaborative
SHEA	Society for Healthcare Epidemiology of America
SHM	Society of Hospital Medicine
SIN	(United Kingdom) Science and Innovation Network
SIR	Standardized Infection Ratio
SIS	Surgical Infection Society
SME	Subject Matter Expert
SNF	Skilled Nursing Facility
SSI	Surgical Site Infection

Acronym	Expansion
SUTI	Symptomatic Urinary Tract Infection
TAP	Targeted Assessment for Prevention
TATFAR	Transatlantic Task Force on Antimicrobial Resistance
TB	Tuberculosis
TJC	The Joint Commission
TST	Tuberculin Skin Test
UK	United Kingdom
UN	United Nations
US	United States
UV	Ultraviolet
VA	(United States Department of) Veterans Affairs
VBP	Value-Based Purchasing
VFC	Vaccines for Children
VIM	Verona integron-encoded metallo-beta-lactamase
VLBWI	Very Low Birth Weight Infants
VON	Vermont Oxford Network
VRBPAC	Vaccines and Related Biological Products Advisory Committee VRBPAC
vSNF	Ventilator Skilled Nursing Facility
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: May 17-18, 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 position statements and guidance documents. In addition, public commentary has been made on a number of issues. 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:

- 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 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:

- N/A

Press activities:

- '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 discussed at meeting of ACOEM's Medical Center Occupational Health Section. The meeting brought together approximately 60 MCOH medical directors from across the country.

The proposed shift from institution-wide to individually based risk assessment was discussed. Concern was expressed by the group regarding the intrusive nature of information-gathering from employees regarding non-occupational tuberculosis risk factors, particularly information which is either potentially socially stigmatizing or regarded as protected health information. In addition, concern was expressed regarding the challenge of administering and enforcing workplace screening programs on a differential and individual-by-individual basis, as determined by non-occupational tuberculosis risk.

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

Meeting Date: May 17-18, 2018

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

Liaison Representative name: Elaine Dekker, BSN, CIC

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

Interim activities and updates:

None reported.

Guidelines and Guidance:

None reported.

Position Statements:

None reported.

Legislation:

- In response to draft legislation for the reauthorization of the **Pandemic and All-Hazards Preparedness Act (PAHPA)**, currently set to expire Sept. 30, America's Essential Hospitals provided feedback to members of the Senate Health, Education, Labor, and Pensions (HELP) Committee (specifically, Senators Burr, Casey, Alexander, and Murray) in early May.

Campaigns and related activities:

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

Press activities:

- **Patient Safety Awareness Week (March 11-17)** – America's Essential Hospitals' staff participated in the Twitter chat hosted by CDC and Institute for Healthcare Improvement. This year's theme—"We Are All Patients"—led to a robust conversation and provided participants with information encouraging the prevention of health care-associated infections and creation a culture of safety.
- Pushed information to members about CDC online training opportunity to teach participants how to optimize prescribing practices to reduce antibiotic resistance – four-part web series on antibiotic stewardship.
- America's Essential Hospitals actively promotes CDC information to our members via social media on timely topics such as antibiotic stewardship and opioid prescribing as well as continuing education opportunities such as recognizing infection risks in medical equipment. For this information and more, you can follow us on Twitter at @OurHospitals and on Facebook at facebook.com/essentialhospitals.

Publications:

- **Opioids** – America's Essential Hospitals has created an [online Opioids resource page \(https://essentialhospitals.org/opioid-resources/\)](https://essentialhospitals.org/opioid-resources/) to provide information to members and the public about this ongoing crisis.

- **Population Health** – Essential hospitals around the country are targeting population health in their communities. The Essential Hospital's Institute has created a [website](http://www.essentialcommunities.org) (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: May 17-18, 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**

Interim activities and updates:

- National Action Plan for Combating Antibiotic-Resistant Bacteria (CARB)
AHRQ continues to support research and implementation projects to develop improved methods and tools to combat antibiotic resistance in all three domains: 1. Promoting antibiotic stewardship (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 has reviewed the first four rounds of applications responding to 2 new CARB-specific FOAs for R01 and R18 applications, in addition to our renewed HAI prevention FOAs. The CARB FOAs have stimulated research grant applications in all 3 CARB domains. In March 2018, AHRQ held a webinar for members of the Society for Healthcare Epidemiology of America (SHEA) to inform them of the areas of AHRQ's scientific interest and the availability of research funding and to stimulate additional interest in applying for AHRQ grants to combat antibiotic resistance.

AHRQ is participating in the Best Practices and Implementation subgroups of the Presidential Advisory Committee on Combating Antibiotic-Resistant Bacteria Infection Prevention and Stewardship working group.

- **AHRQ Safety Program for Improving Antibiotic Use**

The AHRQ Safety Program for Improving Antibiotic Use is funded and guided by AHRQ, and led by Johns Hopkins University and NORC at the University of Chicago. This is a 5-year nationwide project aimed at adapting the Comprehensive Unit-based Safety Program (CUSP) for implementation of Antibiotic Stewardship in 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 pilot period recently closed, with activities in that cohort coordinated in 3 integrated delivery systems that encompass all 3 healthcare settings. A one-year acute care cohort kicked off in December 2017, with over 425 hospitals participating, including over 80 critical access hospitals and 9 DoD facilities. Long-term care and ambulatory cohorts will follow in December 2018 and December 2019 respectively. The project team is actively developing educational materials and technical assistance tools. These materials will be combined into a toolkit to promote implementation of AS in all three settings, which will be made publicly available at the end of the project. 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 which is ongoing. Orthopedic surgery has been added in the second cohort which began in March 2018. More than 240 hospitals are currently participating.

- **AHRQ Safety Program for Intensive Care Units: Preventing CLABSI and CAUTI**
Initiated in September 2015, this project aims to reduce central-line associated bloodstream infections (CLABSI) and catheter-associated urinary tract infections (CAUTI) in intensive care units with persistently elevated rates of these infections. This is a follow-up to AHRQ's nationwide projects of CUSP for CAUTI and CUSP for CLABSI. Implementation strategies tailored to this group continue to be developed, including a modified set of CUSP training resources. Over 300 ICUs were recruited to participate from 4 HHS Regions. A task order contract to expand this project to nationwide coverage, awarded September 29, 2017 to Health Research & Educational Trust, will involve 450-600 additional ICUs. Implementation has begun in the first one-year cohort of the expansion phase, involving over 125 ICUs.

Publications:

Selected AHRQ-funded publications:

- Allegranzi, B., Aiken, A. M., Zeynep Kubilay, N., et al. (2018). A multimodal infection control and patient safety intervention to reduce surgical site infections in Africa: a multicentre, before-after, cohort study. *Lancet Infect Dis*, 18(5), 507-515.
- Anderson, D. J., Knelson, L. P., Moehring, et al. (2018). Implementation Lessons Learned From the Benefits of Enhanced Terminal Room (BETR) Disinfection Study: Process and Perceptions of Enhanced Disinfection with Ultraviolet Disinfection Devices. *Infect Control Hosp Epidemiol*, 39(2), 157-163.
- Cocoros, N. M., Priebe, G., Gray, J. E., et al. (2017). Factors Associated With Pediatric Ventilator-Associated Conditions in Six U.S. Hospitals: A Nested Case-Control Study. *Pediatr Crit Care Med*, 18(11), e536-e545.
- Harris, A. D., Sbarra, A. N., Leekha, S., et al. (2018). Electronically Available Comorbid Conditions for Risk Prediction of Healthcare-Associated *Clostridium difficile* Infection. *Infect Control Hosp Epidemiol*, 39(3), 297-301.
- Jonokuchi, A. J., Knopman, J., Radwanski, R. E., et al. (2018). Topical vancomycin to reduce surgical-site infections in neurosurgery: Study protocol for a multi-center, randomized controlled trial. *Contemp Clin Trials*, 64, 195-200.
- Jump, R. L. P., Crnich, C. J., Mody, L., et al. (2018). Infectious Diseases in Older Adults of Long-Term Care Facilities: Update on Approach to Diagnosis and Management. *J Am Geriatr Soc*, 66(4), 789-803.
- Katz, M. J., Gurses, A. P., Tamma, P. D., et al. (2017). Implementing Antimicrobial Stewardship in Long-term Care Settings: An Integrative Review Using a Human Factors Approach. *Clin Infect Dis*, 65(11), 1943-1951.
- Le, P., Nghiem, V. T., Mullen, P. D., et al. (2018). Cost-Effectiveness of Competing Treatment Strategies for *Clostridium difficile* Infection: A Systematic Review. *Infect Control Hosp Epidemiol*, 39(4), 412-424.
- Moehring, R. W., Dodds Ashley, E. S., Ren, X., et al. (2018). Denominator Matters in Estimating Antimicrobial Use: A Comparison of Days Present and Patient Days. *Infect*

Control Hosp Epidemiol, 39(5), 612-615.

- Patel, P. K., Gupta, A., Vaughn, V. M., et al. (2018). Review of Strategies to Reduce Central Line-Associated Bloodstream Infection (CLABSI) and Catheter-Associated Urinary Tract Infection (CAUTI) in Adult ICUs. *J Hosp Med*, 13(2), 105-116.
- Taaffe, K., Lee, B., Ferrand, Y., et al. 2018). The Influence of Traffic, Area Location, and Other Factors on Operating Room Microbial Load. *Infect Control Hosp Epidemiol*, 39(4), 391-397.

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

Meeting Date: May 17 & 18, 2018

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

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

Organization represented: **American Nurses Association**

Interim activities and updates:

- ANA/CDCs' 2 year collaboration involving 20 specialty or state nursing organizations finishes May 31, 2018. During that time, the organizations have tailored infection prevention & control education to maximize adherence and enhance nurse confidence to care for patients with potentially highly contagious diseases. Throughout the past two years, the organizations have provided in person training and collaborated with each other to produce eight webinars, currently archived on CDC's [Safe Healthcare](https://www.cdc.gov/infectioncontrol/training/safe-healthcare-webinars.html) website (<https://www.cdc.gov/infectioncontrol/training/safe-healthcare-webinars.html>).
- On May 25th, ANA will be participating in a Leading Practices in Antimicrobial Stewardship Technical Expert Panel. Key stakeholders include The Joint Commission, the Centers for Disease Control and Prevention, the National Quality Forum, the American Hospital Association, and The Pew Charitable Trusts.

Guidelines and Guidance: No update

Position Statements: No update

Legislation: No update

Campaigns and related activities: No update

Press activities: No update

Publications: No update

Other items of note: The ANA/CDC 2017 [White Paper](https://www.cdc.gov/antibiotic-use/healthcare/pdfs/ANA-CDC-whitepaper.pdf) (<https://www.cdc.gov/antibiotic-use/healthcare/pdfs/ANA-CDC-whitepaper.pdf>) defining nurses' role in antibiotic stewardship has caught the eye of UK nurse experts in the field of infection prevention & control; discussions are underway to crystallize how we can support each other in developing team approaches to stewardship across the continuum of care.

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

Meeting Date: May 17-18, 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:

- OR Attire Consensus Statement
 - The American College of Surgeons (ACS), the American Society of Anesthesiologists (ASA), the Association of peri-Operative Registered Nurses (AORN), the Association for Professionals in Infection Control and Epidemiology (APIC), the Association of Surgical Technologists (AST), the Council on Surgical and Perioperative Safety (CSPS), and The Joint Commission (TJC) met on February 27, 2018, to review and discuss the literature related to recommendations for operating room (OR) attire, specifically ear and hair covering.
 - Over the past two years, as recommendations were implemented, it became increasingly apparent that in practice, covering the ears is not practical for surgeons and anesthesiologists and in many cases counterproductive to their ability to perform optimally in the OR. Furthermore, in reassessing the strength of the evidence for this narrowly defined recommendation, the group concluded the following:
 - Evidence-based recommendations on surgical attire developed for perioperative policies and procedures are best created collaboratively, with a multi-disciplinary team representing surgery, anesthesia, nursing, and infection prevention.
 - The requirement for ear coverage is not supported by sufficient evidence.
 - At present, available scientific evidence does not demonstrate any association between the type of hat or extent of hair coverage and SSI rates. One recent study¹ on head coverings (disposable bouffant or skullcap, cloth cap), identified that the commonly available disposable bouffant hat is the least effective barrier to transmission of particles.
 - Other issues regarding areas of surgical attire need further evaluation.

1. Markel TA, Gormley T, Greeley D, Ostojic J, Wise A, Rajala J, Bharadwaj R, Wagner J. Hats Off: A Study of Different Operating Room Headgear Assessed by Environmental Quality Indicators. JACS, 225(5): 573-581, 2017.

- AORN Global Surgical Conference & Expo 2019, April 6-10, Nashville, TN
 - Proposals to speak due by May 31, 2018
 - Poster abstracts due by September 30, 2018

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). ***Launching a new electronic subscription platform in 2018!***
- Guidelines are posted for a 30-day public comment period at the AORN "Open for Public Comments" [website \(https://www.aorn.org/events/public-comments\)](https://www.aorn.org/events/public-comments).
- The 2018 *Guidelines for Perioperative Practice* include 6 new evidence-rated guidelines: Positioning, Medication Safety, Prevention of Venous Thromboembolism, Team

- Communication, Product Evaluation and Manual Chemical High Level Disinfection.
- Guidelines in development for 2019 print publication
 - Safe Patient Handling and Management: electronic publication July 2018
 - Design and Maintenance of the Surgical Suite (Formerly Safe Environment of Care, Part 2): electronic publication August 2018
 - Sterilization: public comment May 9- June 6, 2018
 - Safe Environment of Care: public comment June 2018
 - Sterile Technique: public comment July 2018
 - Transmission-based Precautions (Formerly Transmissible Infections): public comment August 2018
- Guidelines in development for 2020 print publication
 - Attire: public comment January 2- February 22, 2019

Position Statements:

- Available at the AORN "Position Statements" [website](http://www.aorn.org/guidelines/clinical-resources/position-statements) (<http://www.aorn.org/guidelines/clinical-resources/position-statements>)
- Revised February 2018:
 - Orientation of the Registered Nurse and Surgical Technologist to the Perioperative Setting
 - Criminalization of Human Errors in the Perioperative Setting

Legislation:

- AORN legislative priorities for 2018 are RN as circulator, preserving and protecting the Perioperative Registered Nurse's scope of practice, supporting workplace safety and patient safety initiatives, and advancing positive health care improvements.

Campaigns and related activities:

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

Press activities:

- Recent AORN press releases can be accessed at the AORN "Press Releases" [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 has joined the Guidelines International Network as an organizational member.

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

Meeting Date: May17-18, 2018

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

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

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

Interim activities and updates:

- The newly updated [Ready Reference for Microbes, 4th edition](http://apic.informz.net/z/cjUucD9taT02ODQxNTk5JnA9MSZ1PTg0ODI0NDU0NyZsaT01MDc5MjUwNQ/index.html) (<http://apic.informz.net/z/cjUucD9taT02ODQxNTk5JnA9MSZ1PTg0ODI0NDU0NyZsaT01MDc5MjUwNQ/index.html>) available
- EPI in Long-Term Care Certificate Series (*Certificate of Training in Infection Prevention in the Long-Term Care Setting*): APIC's fully updated course prepares IPs and facilities to comply with LTC federal regulations. During the course of 2018, APIC will have offered this course in 10 or more states.
- Launching in May 2018: EPI for Long-Term Care Education Series Online
- In development: EPI for Ambulatory Care
- In development: revision of the APIC Competency Model (expected release, June 2019)

Guidelines and Guidance:

N/A

Position Statements:

- APIC, together with the Society for Healthcare Epidemiology of America (SHEA), and the Society of Infectious Disease Pharmacists (SIDP) published a joint [position paper](https://www.ajicjournal.org/article/S0196-6553(18)30001-4/fulltext?code=ymic-site) ([https://www.ajicjournal.org/article/S0196-6553\(18\)30001-4/fulltext?code=ymic-site](https://www.ajicjournal.org/article/S0196-6553(18)30001-4/fulltext?code=ymic-site)) "Antimicrobial stewardship and infection prevention—leveraging the synergy: A position paper update," highlighting the importance of a well-functioning IPC program as a central component to a successful AS strategy.
- APIC together with The American College of Surgeons (ACS), the American Society of Anesthesiologists (ASA), the Association of peri-Operative Registered Nurses (AORN), the Association of Surgical Technologists (AST), the Council on Surgical and Perioperative Safety (CSPS); and The Joint Commission (TJC) released a statement resulting from their discussions on ear and hair covering in the OR.

Legislation:

- Submitted [comments to CMS](https://apic.org/Resource/TinyMceFileManager/Advocacy-PDFs/Advocacy%20Updates/IMPACT%20Medication%20Profile%20measures%20final%205-1-18.pdf) (<https://apic.org/Resource/TinyMceFileManager/Advocacy-PDFs/Advocacy Updates/IMPACT Medication Profile measures final 5-1-18.pdf>) on proposed quality measure to satisfy the IMPACT Act domain of transfer of Health Information and Care Preferences When an Individual Transitions – Medication Profile Transferred to Provider/Medication Profile Transferred to Patient.
- Submitted [comments to HHS](http://www.apic.org/Resource/TinyMceFileManager/Advocacy-PDFs/Phase%204%20HAI%20Action%20Plan%20--%20APIC%20final%2012-21-17.pdf) (<http://www.apic.org/Resource/TinyMceFileManager/Advocacy-PDFs/Phase 4 HAI Action Plan -- APIC final 12-21-17.pdf>) on Phase Four of the National Action Plan to Prevent Healthcare-Associated Infections: Road Map to Elimination; Coordination Among Federal Partners to Leverage HAI Prevention and Antibiotic Stewardship.

Campaigns and related activities:

N/A

Press activities:

- Issued press releases to promote studies in the *American Journal of Infection Control*:
 - Nursing homes can prevent infections through performance improvement collaboratives
 - Younger patients constitute half of hospital-acquired pneumonia cases, most of which originate outside of the ICU
 - Rigorous hand hygiene-intervention practices can lower mortality, antibiotic prescription rates in nursing homes
 - Leadership rounds foster culture that reduces healthcare-associated infections

Publications:

- *Prevention Strategist* winter issue included articles on: Common etiologic agents of pneumonia; CMS mandates for water management programs in healthcare facilities; project management skills for IPs; making the business case, and talking with the C-suite.
- *Prevention Strategist* spring issue included articles on: Hepatitis A; Vanderbilt receiving the inaugural *Program of Distinction* designation; Proficient Practitioner Bridge: A new self-assessment in professional development for IPs; Useful financial analysis tools; APIC 2018 sneak peek; Sepsis protocol and healthcare facility–onset *Clostridium difficile* infection; and How frontline collaboration can reduce healthcare-associated infections.
- In June 2018 issue of *AJIC*: “Update to the Centers for Disease Control and Prevention and the Healthcare Infection Control Practices Advisory Committee Guideline for the Prevention of Surgical Site Infection (2017): A summary, review, and strategies for implementation.” Lyndsay M. O’Hara PhD, MP, Kerri A. Thom MD, MS, Michael Anne Preas MS, RN, CIC, FAPIC
- Expected release, June 2018: APIC Implementation Guide: Infection Preventionist’s Guide to the OR
- 4 additional articles based on MegaSurvey data expected in the fall

Other items of note:

- APIC’s Industry Perspectives [website \(www.industryperspectives.com\)](http://www.industryperspectives.com) continues to receive steady monthly visits from IPs and other healthcare professionals. This website showcases research-based content provided by industry and is designed to enhance IP competency.

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

Meeting Date: May 17-18, 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 build on healthcare-associated infection (HAI) prevention efforts by providing support to state health agencies, promoting sound public health policies, and building strong partnerships. Key areas of ASTHO's HAI work include:
 - Co-leadership of the Council for Outbreak Response: Healthcare-Associated Infection and Antimicrobial-Resistant Pathogens, (CORHA). ASTHO, in collaboration with the Council of State and Territorial Epidemiologists (CSTE), supports CORHA members and workgroups to develop and promote tools to assist with the detection, reporting, investigation, and control of HAI outbreaks, across the public health-healthcare continuum. The CORHA [website \(http://corha.org/\)](http://corha.org/) – currently in its early stages—features a “Resource Hub” designed to house CORHA-developed products and external resources.
 - Exploring the nature of state HAI outbreak reporting policies through qualitative interviews with HAI Coordinators and other key-informants in seven states that were identified as part of a CDC legal scan. The information gathered from these interviews will be used to inform a report on how the existence, content, language, and structure of an HAI outbreak reporting policy influences the reporting of HAI outbreaks to public health. These results will also help inform the work of CORHA, the development of future guidance on HAI/AR outbreak response and investigation, and future ASTHO state HAI/AR policy initiatives.

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/#), available at <http://www.astho.org/state-legislative-tracking/#>

Press activities:

- ASTHO Immediate Past-President, Dr. Jay Butler (AK), participated in a recent [CDC media telebriefing \(https://www.cdc.gov/media/releases/2018/t0403-antibiotic-resistant-germs.html\)](https://www.cdc.gov/media/releases/2018/t0403-antibiotic-resistant-germs.html) on CDC's newly-released *Vital Signs* report on antibiotic resistance.

Publications:

- ASTHO recently published a [success story \(http://www.astho.org/Infectious-Disease/HAI/Healthcare-and-Infection-Control-Gateway/ASTHO-Resources/Arkansas-Mobilizes-Public-Health-and-Healthcare-Partners-to-Halt-Healthcare-Associated-Infection-Outbreak/?utm_source=Informz&utm_medium=email&utm_campaign=change%20this%20\(per%20campaign\)\)](http://www.astho.org/Infectious-Disease/HAI/Healthcare-and-Infection-Control-Gateway/ASTHO-Resources/Arkansas-Mobilizes-Public-Health-and-Healthcare-Partners-to-Halt-Healthcare-Associated-Infection-Outbreak/?utm_source=Informz&utm_medium=email&utm_campaign=change%20this%20(per%20campaign)) describing an effective HAI outbreak response conducted by the

Arkansas Department of Health. The story highlights a public health and healthcare partnership that was strengthened as a result of CDC's Infection Control Assessment and Response (ICAR) program to improve infection prevention practices and quality improvement activities.

- Other ASTHO HAI publications are available [on the ASTHO website \(http://www.astho.org/healthcare-and-infection-control/\)](http://www.astho.org/healthcare-and-infection-control/)

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

Meeting Date: May 17-18, 2018

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

Liaison Representative Name: Marion Kainer

Organization represented: **Council of State and Territorial Epidemiologists**

Interim activities and updates:

- **CSTE annual conference** will be held June 10-14 in West Palm Beach, Florida. Information is available at the CSTE Conference [website \(http://csteconference.org/2018/\)](http://csteconference.org/2018/).
- **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 May 2018. A one-pager describing the mission, vision, membership can be found at 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):
 - 1) Create standard definitions for outbreaks and exposure events and thresholds for reporting;
 - 2) Improve reporting of outbreaks and exposure events to public health;
 - 3) Improve the use of existing surveillance systems to detect outbreaks.
 - CORHA Workgroup B (Outbreak investigation and control) will work on
 - 1) Defining appropriate levels of response;
 - 2) Improve response to investigation and control of outbreaks to public health;
 - 3) Improve data management for outbreak investigation and tracking
 - CORHA Laboratory Workgroup (about to be formed: draft charge)
 - 1) Promote and support improvement of laboratory response to HAI outbreaks
 - 2) Define public health, clinical, and commercial laboratory best practices to support outbreak detection and response
 - 3) Improve collaborations with healthcare facilities and state/local public health departments
- **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).
- Guided by the strategic map and profile, the Task Force currently consists of two working groups that support the next steps of planning, collaboration, and actions to achieve its strategic objectives. These two working groups will assess, plan, and make recommendations for action by federal, state, and local public health agencies; informatics organizations; and clinical care providers organizations and facilities.
 - The Lab Data to Public Health (Lab) workgroup works to identify and recommend strategies to improve the communication of standardized and timely information on AR from labs to public health. The lab workgroup recently conducted an assessment targeted toward clinical and public health laboratories to collect data relevant to the strategic objectives.
 - The Public Health Informatics Tools for Epidemiology (Informatics) workgroup aims to identify strategies and make recommendations on the use of public health informatics and information technology tools to strengthen AR surveillance, including identifying gaps and needs in surveillance and the resources required to fill them. The Informatics workgroup recently conducted a series of focus group interviews with relevant stakeholders, including CDC labs and programs, IT vendors, and AR surveillance staff at state and local health departments.
 - A CP-CRE sub-workgroup in the Informatics workgroup was created to develop draft data elements for inclusion in the CP-CRE message mapping guide. These proposed data elements were submitted to the CDC for consideration in late 2017.
 - The Task Force will convene in-person in Atlanta, GA on May 21-22, 2018. The objective of the meeting will be to review findings from parallel assessments conducted by both workgroups, and to use these data to inform broad recommendations for antimicrobial resistance surveillance.
 - 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 very close to being reviewed by other CSTE members (e.g., Substance Abuse)
 - **Data analysis and Presentation Standards (DAPS) toolkit**
 - Work underway to update/ expand the DAPS toolkit. Current toolkit is 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 (to be voted on by membership at annual meeting):

- **18-ID-05** – Standardized Case Definition for *Candida auris* Causing Clinical Infection or Colonization in People (including *C. auris* to the nationally notifiable conditions list)

Other Position statements:

- **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

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

Meeting Date: May, 2018

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

Liaison Representative name: Lisa McGiffert

Organization represented: **Consumers Union/Consumer Reports**

Legislation:

- In March 2018, Consumers Union [opposed](#) the House version of the Right to Try Act of 2018 (H.R.5247) that allows certain patients to access drugs that have not been approved by FDA (<https://consumersunion.org/research/cu-letter-to-house-of-representatives-opposing-the-right-to-try-act-of-2018-h-r-5247/>). We believe the Right to Try Act would erode FDA's current system of drug approval and oversight and, more importantly, could weaken consumer trust in the medications that are recommended and made available to them. The Senate version allowed for even more flexibility and reports now that it will be taken up by the House again this week.

Campaigns and related activities:

- Consumers Union, our advocacy arm, helped to create an independent new patient led and patient driven coalition called the [Patient Safety Action Network](http://www.patientsafetyaction.org) (<http://www.patientsafetyaction.org>) which will continue much of the work of the Safe Patient Project, which has been phased out. I have directed this project for the past 15 years and I am retiring from Consumer Reports at the end of this month. I will continue to work with PSAN on healthcare-acquired infections and other issues related to medical harm.

Publications:

- Stem cell therapy [article](#) January 2018 (<https://www.consumerreports.org/medical-treatments-procedures/trouble-with-stem-cell-therapy/>)
- [Article](#) on the role of infectious disease doctors in March 2018 (<https://www.consumerreports.org/medical-conditions/the-one-doctor-you-need-to-see-if-you-get-an-antibiotic-resistant-infection/>)
- Consumer Reports [published hospital ratings](#) since our last meeting (<https://www.consumerreports.org/health/hospitals/ratings>), but that will be our last ratings as we are phasing out our Health Ratings Center.
- We will continue to cover health and healthcare issues that consumers need on a daily basis to make informed choices. This includes coverage in Consumer Reports online and in print, as well as our Consumer Reports On Health newsletter, and some targeted advocacy efforts in the medical privacy arena.

Other items of note:

- Consumer Reports has made enormous investments in a wide variety of healthcare work over the past 15 years. We are very proud of the work we have done in partnership with many foundations, nonprofits, other allies and in particular, CDC.
 - We are now shifting our resources into other growing areas of need, like the need for data privacy and security in the age of Facebook and Equifax. We will expand our work on privacy into the area of health, and we are looking to expand our work on the safety and sustainability of our food system, including the use of antibiotic in food production.

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

Meeting Date: May 17-18, 2018

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

Ex officio member name: Yvonne Chow

Agency represented: **Federal Office of Rural Health Policy/Health Resources and Services Administration**

Interim activities and updates:

- FORHP worked with CDC to create 3 [one-pagers](#) to help critical access hospitals find and add the Patient Safety Component – NHSN Annual Facility Survey into their profile. (<https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/add-edit-psc-survey-508.pdf>)
- CDC will start sending NHSN Annual Facility Survey data regularly to FORHP to integrate into the data reports sent out to critical access hospitals as well as to state grantees in order to properly monitor and provide technical assistance to hospitals.
- FORHP attended CDC's HAI/AR all-partners meeting in March to meet with state grantees to discuss ways to collaborate together)

Guidelines and Guidance:

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

- none

Position Statements:

- none

Legislation:

- none

Campaigns and related activities:

- none

Press activities:

- none

Publications:

- none

Other items of note:

- none

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

Meeting Date: May 17-18, 2018

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

Liaison Representative name: Stephen Weber, MD

Organization represented: **Infectious Diseases Society of America**

Interim activities and updates:

- IDSA and members have actively promoted the findings of a recent article (Burnham, et al) published in Open Forum on Infectious Diseases that **consultation with ID-trained physicians are associated with improved outcomes**. Researchers analyzed records for approximately 4,200 patients with infections resistant to multiple antibiotics from 2006 to 2015 at one academic medical center. Thirty-day mortality rates were about 50 percent lower among patients with certain multidrug-resistant infections who had infectious diseases (ID) specialists involved in their care. Among patients with Enterobacteriaceae infections resistant to several antibiotics, an ID consultation was associated with a 59 percent reduction in 30-day mortality.
- The IDSA Antimicrobial Stewardship Curriculum for Fellows Workgroup has authored the recent CID article, **Antimicrobial Stewardship Training for Infectious Diseases Fellows: Program Directors Identify a Curriculum Need**, which describes the identified gap in educational resources available to train ID fellows in antimicrobial stewardship, and the core curriculum that was developed in response to provide foundational training in stewardship. The core curriculum will be available in July 2018. An advanced curriculum aimed to prepare fellows to lead ASPs is currently in development.
- **IDSA and HIVMA call for sustained, evidence-based responses to the link between infectious diseases and opioid use disorders**. IDSA and HIVMA members called on both the Congress and the Administration to pursue dedicated responses to the opioid epidemic and its infectious diseases impacts. New funding is needed to increase surveillance of injection-related infections, to expand evidence-based infection prevention strategies (including syringe services programs), and to build ID and substance use treatment workforce capacities.
- **The Infectious Diseases Society of America strongly supports the Strategies to Address Antimicrobial Resistance (STAAR) Act**—that will strengthen US government responses to this growing public health crisis. AMR poses a significant threat to patient safety, public health and even national security. A well-coordinated, sustained federal response is necessary to improve prevention, detection, tracking and treatment of infections caused by dangerous multidrug resistant pathogens.

Guidelines and Guidance:

- *Clostridium difficile* (Clin Infect Dis Apr 2018)
- Management of Catheter-Related Infections (Update in Progress)
- Prevention of Healthcare-Associated Infections in Acute Care Hospitals (Update in Progress)
- Link to other guidelines on [website \(http://www.idsociety.org/IDSA_Practice_Guidelines/\)](http://www.idsociety.org/IDSA_Practice_Guidelines/)

Legislation:

- **Legislative activity.** IDSA has been particularly active in offering comments and feedback regarding legislative activity and proposals related to access to health care, drug

development and other issues:

- Pandemic and All Hazards Preparedness Act (PAHPA) (Mar 2018)
- Strategies to Address Antimicrobial Resistance (STAAR) Act (Febr 2019)
- Rescission Package (May 2018)
- **Advocacy:** IDSA continues to aim to enhance awareness and activism among members regarding policies related to infectious diseases practice, infection prevention and antimicrobial resistance.
- Link to other legislative and advocacy activity is on the IDSA [website](http://www.idsociety.org/Policy/) (<http://www.idsociety.org/Policy/>)

Campaigns and related activities:

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

Publications:

- Vera P Luther, Rachel Shnekendorf, Lilian M Abbo, Sonali Advani, Wendy S Armstrong, Alice E Barsoumian, Cole B Beeler, Rachel Bystritsky, Kartikeya Cherabuddi, Seth Cohen, Keith W Hamilton, Dilek Ince, Julie Ann Justo, Ashleigh Logan, John B Lynch, Priya Nori, Christopher A Ohl, Payal K Patel, Paul S Pottinger, Brian S Schwartz, Conor Stack, Yuan Zhou; Antimicrobial Stewardship Training for Infectious Diseases Fellows: Program Directors Identify a Curriculum Need, *Clinical Infectious Diseases*. 2018 Apr
- Jason P Burnham, Margaret A Olsen, Dustin Stwalley, Jennie H Kwon, Hilary M Babcock, Marin H Kollef; Infectious Diseases Consultation Reduces 30-Day and 1-Year All-Cause Mortality for Multidrug-Resistant Organism Infections, *Open Forum Infectious Diseases*, 2018 Mar 1; 5(3)
- Banach DP, et al. Outbreak Response and Incident Management: SHEA Guidance and Resources for Healthcare Epidemiologists in United States Acute-Care Hospitals. *Infection Control & Hospital Epidemiology*; 2017; 38: 1393 -1419

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

Meeting Date: May 17-18, 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:

- November 2017- present: To foster and expand local health department (LHD) HAI activities and HAI prevention, NACCHO continues to work with three HAI demonstration sites. The current project year focuses on local health departments' antibiotic stewardship efforts and evaluation of the project impact; the three funded demonstration sites and their general activities are below.
 - The Florida Department of Health in Orange County – Orlando, FL is developing a report from their social network analysis using Medicaid data provided by the Centers for Disease Control and Prevention. DOH-Orange will also develop a toolkit to enable other local health departments to replicate the process. DOH- Orange will also conduct infection prevention trainings in long term care facilities, finalize a toolkit on asymptomatic bacteriuria, and create a Return on Investment toolkit based on findings from a local cost-based analysis for HAI events.
 - The DuPage County Health Department in Wheaton, IL is addressing handwashing and antimicrobial stewardship (AS) among the general public through an advertising campaign; engaging 2-3 long term care facilities to improve stewardship efforts and implementation of CDC Core Elements for Antimicrobial Stewardship; and continuing collaboration with the Illinois HAI program through local meetings and supporting the statewide Antimicrobial Stewardship Summit.
 - The Philadelphia Department of Public Health in Philadelphia, PA is sustaining a Philadelphia Antimicrobial Stewardship Collaborative to provide regional leadership and advocacy; establishing a LTCF listserv for AS and IP information dissemination, implementing a survey among long term care facilities to establish a baseline for AS practices; providing training opportunities for staff within the health department and healthcare facility partners specific to antimicrobial stewardship and/or infection prevention specifically associated with multi-drug resistant organisms; and collaborating with the Pennsylvania Department of Health HAI staff.
 - NACCHO is conducting in-depth qualitative interviews with each demonstration site to evaluate the HAI and AS work conducted at each demonstration site, as well as the impact of engaging with NACCHO and peer demonstration sites on their work.
- November 2017- present: NACCHO staff convene the ELC HAI/AR Directly Funded Cities quarterly to provide a platform for program staff and laboratories to share activity updates, lessons learned, and emerging issues.
- November 2017- present: In an effort to improve local infection control and preparedness and response to Ebola and other infectious disease threats in healthcare and community settings, NACCHO is updating the [Healthcare-Associated Infections: A Toolkit for Local Health Departments](http://essentialelements.naccho.org/archives/7223) toolkit created last year (<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. Anticipated release of this update is June 2018.

- January 23, 2018: To support local health departments obtain access to data, NACCHO hosted a webinar on the National Healthcare Safety Network (NHSN) and changes to the data use agreement that will allow local health departments to access NHSN data. Participants (91 total) heard from the CDC, Los Angeles County Department of Public Health, and Philadelphia Department of Public Health about the process to gain access, lessons learned, strategies for success, and current data use for local health departments. The recording is available on NACCHO's Essential Elements blog.
- March 19-21, 2018: Two NACCHO staff attended the 2018 ELC HAI/AR Grantees' Meeting.
 - NACCHO staff met with ELC HAI/AR Grantees and explored how they engage with their local health departments. In addition, NACCHO staff participated in a breakout session that explored unique challenges that directly funded cities encounter, strategies they have employed to navigate these challenges, and how they work in collaboration with their state health departments.
- Ongoing Activities:
 - NACCHO staff and four local health department representatives participate on CORHA workgroup and All-Member calls. Stephanie Black, MD, MSc (Chicago, IL) and Hillary Hanson, MS, MPH (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.
 - November 30- December 1: CORHA in person meeting
 - In January 2018, Sri Seshadri, MBBS, MPH, PhD(c) left his position at Barren River and vacated his representative position with NACCHO on CORHA.
 - March 2018: NACCHO nominated Hillary Hansen, MS, MPH (Flathead, MT) to serve as NACCHO's new formal representative. Ms. Hansen had previously served in an advisory capacity on CORHA. On May 1, 2018, Ms. Hansen was approved by CORHA's Governance Committee to serve as a formal CORHA member.
 - March 2018: NACCHO nominated Lauren Orkis, DrPh (Allegheny County, PA) to serve as a non-voting advising member on workgroup B and is currently awaiting approval for this nomination.
 - March 2018: NACCHO submitted a letter to nominate Massimo Pacilli, MS, MPH (Chicago, IL) to represent NACCHO on CORHA's developing lab workgroup and is currently awaiting approval for this nomination.
 - Participate in the following meetings, conference calls, and committees related to (1) obtaining updates on HAIs, injection safety, antimicrobial resistance, and infection control; and (2) determining how NACCHO can support national efforts to address related issues
 - Safe Injection Practices Coalition partner calls
 - CSTE HAI Standards Committee calls
 - Making Dialysis Safer for Patients Coalition calls
 - Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria (PACCARB)

- In April 2018 NACCHO submitted a letter of support for Stephanie Black, MD, MSc in support of her nomination to serve on PACCARB.
- March 2, 2018: NACCHO staff participated in the PACCARB teleconference where members discussed and voted on resolution letters drafted by the Immediate Action Subcommittee.
- Convene ASTHO and CSTE via monthly conference calls to discuss HAI activities and share updates.
- Promote HAI prevention and infection control news and resources via NACCHO's regular communication channels that reach nearly 3,000 LHDs.

Guidelines and Guidance:

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

No Guidance updates at this time.

Position Statements:

- November 24, 2017: NACCHO submitted a letter in response to the opportunity to comment on the National Antimicrobial Resistance Monitoring System (NARMS) in support of efforts to strengthen NARMS surveillance, increase data connectivity, and improve the system's capability to explain the dynamics of resistance under a One Health paradigm
- January 16, 2018: Signed onto IDSA Strategies to Address Antibiotic Resistance (STAAR) Act
- March 8, 2018: Signed onto S-FAR letter to Kadlec on antimicrobial resistance
- April 2, 2018: Signed onto S-FAR Introduction letter to new HHS Secretary Azar
- April 2, 2018: Signed onto S-FAR Introduction letter to new CDC Director Redfield
- April 2, 2018: Signed onto S-FAR Introduction letter to new ASH Giroir
- NACCHO staff and workgroup members have been updating policy statement on Multidrug-resistant organisms, the revised statement is anticipated to be released after June 7, pending Board approval.

Legislation:

No legislative updates at this time.

Campaigns and related activities:

February 28, 2018- March 1, 2018: Through collaborative efforts with The Pew Charitable Trusts, three NACCHO staff and six NACCHO members participated in Pew Supermoms against Superbugs Briefing and Hill visits to raise awareness of the growing public health and security threat posed by drug-resistant bacteria.

Press activities:

None reported.

Publications:

- December 8, 2017: To mark National Handwashing Awareness Week (Dec. 4-10), NACCHO promoted Tacoma-Pierce County Health Department efforts to promote proper handwashing on the [Essential Elements of Public Health blog](http://essentialelements.naccho.org/archives/8705) (<http://essentialelements.naccho.org/archives/8705>)
- January 2018: NACCHO featured two local health departments (Houston, TX and Eau Claire County, WI) in the [Winter 2018 edition of the NACCHO Exchange](http://essentialelements.naccho.org/archives/9545) (<http://essentialelements.naccho.org/archives/9545>). The Exchange is NACCHO's

- quarterly print publication that is sent to all NACCHO member health departments.
- May 7, 2018: NACCHO supported Allegheny County's submission of a [Story from the Field](http://www.nacchostories.org/allegheny-county-health-department-assesses-antibiotic-stewardship/) (<http://www.nacchostories.org/allegheny-county-health-department-assesses-antibiotic-stewardship/>), highlighting their work promoting antimicrobial stewardship.

Other items of note:

No other updates at this time.

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

Meeting Date: May 17-18, 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**

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). Most recent studies include an investigation of environmental contamination with *bla_{KPC}*-positive organisms, which included the fortuitous isolation of an unusual organism carrying the *bla_{KPC}* gene, *Leclercia adecarboxylata*. Following this unusual organism, we have been able to track movement around the institution and determine that it was related to contaminated housekeeping equipment. The paper describing this focus on contamination of the environment with MDROs, was published in *mBio*, (Weingarten RA, Johnson RC, Conlan S, Ramsburg AM, Dekker JP, Lau AF, Khil, P, Odom RT, Deming C, Park M, Thomas PJ, Nisc Comparative Sequencing Program, Henderson DK, Palmore TN, Segre JA, Frank KM. Genomic Analysis of Hospital Plumbing Reveals Diverse Reservoir of Bacterial Plasmids Conferring Carbapenem Resistance. *MBio*. 2018;9(1).)
- The Clinical Center continues to investigate the intermittent isolation of *Sphingomonas koreensis* that has been identified from our potable water supply. Twelve clonal infections have been identified over a 12-year period. A manuscript describing these findings has been submitted for publication. We have worked with experts from CDC (special thanks to Matthew Arduino, DRPH, Senior Advisor, Division of Healthcare Quality Promotion, CDC), and industry (Phigenics, Inc.) to develop strategies for remediation. Though our patient population continues to be substantially immunosuppressed, no additional infections have been detected for 16 months.
- After 20 years of leading our Department of Laboratory Medicine, Tom Fleisher, M.D. retired, and we are now recruiting for a new Chief. In addition, two of our staff microbiologists have accepted new positions (one in a new laboratory in the Department of Laboratory Medicine and the other as a tenure-track scientist in the National Institute of Allergy and Infectious Diseases. Thus, we find ourselves recruiting for three senior staff positions in our Department of Laboratory Medicine.

Guidelines and Guidance:

None reported.

Position Statements:

None reported.

Legislation:

None reported.

Campaigns and related activities:

None reported.

Press activities:

None reported.

Publications:

1. Dulanto Chiang A, Sinaii N, Palmore TN. Risk factors for viridans group streptococcal bacteraemia in neutropenic and non-neutropenic patients: A single center case-case-control study. *Open Forum Infectious Diseases* 2018 Jan 1; 5(1): ofx260.
2. Decker BK, Lau AF, Dekker JP, Spalding CD, Sinaii N, Conlan S, Henderson DK, Segre JA, Frank KM*, Palmore TN*. Healthcare personnel intestinal colonization with multidrug-resistant organisms. *Clin Microbiol Infect.* 2018 Jan; 24(1): 82.e1-82.e4.
3. 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.

Book Chapters:

1. Palmore TN. "Whole genome sequencing for outbreak investigation" in Bearman G, Munoz-Price S, Morgan DJ, Murthy RK, eds., *Infection Prevention*. Switzerland: Springer International, 2018.
2. 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:

None reported.

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

Meeting Date: May 17-18, 2018

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

Liaison Representative name: Kathy Dunn

Organization represented: **Public Health Agency of Canada**

Interim activities and updates:

- The Centre for Communicable Diseases and Infection Control develops national evidence based guidance and oversees a number of surveillance systems and programs that address issues and trends in Canada related to healthcare associated infections

Guidelines and Guidance:

- Guideline on the Prevention of Transmission of Bloodborne Viruses from Infected HCWs in Healthcare Settings (Public consultation completed – final edits & translation in progress)
- Guideline on Preventing Transmission of Carbapenem-resistant Bacteria in Healthcare Settings (update in progress)
- Guideline on the Prevention and Control of Occupational Infections (update in progress)

Publications:

- [Response](https://www.cambridge.org/core/services/aop-cambridge-core/content/view/8F5D864E6959E265BB4931C795267331/S0899823X18000247a.pdf/response%20to%20alert%20on%20possible%20infections%20with%20mycobacterium%20chimaera%20from%20contaminated%20heatercooler%20devices%20in%20hospitals%20participating%20in%20the%20canadian%20nosocomial%20infection%20surveillance%20program%20cnisp.pdf) to Alert on Possible Infections with *Mycobacterium chimaera* From Contaminated Heater-Cooler Devices in Hospitals Participating in the Canadian Nosocomial Infection Surveillance Program (CNISP)
([https://www.cambridge.org/core/services/aop-cambridge-core/content/view/8F5D864E6959E265BB4931C795267331/S0899823X18000247a.pdf/response to alert on possible infections with mycobacterium chimaera from contaminated heatercooler devices in hospitals participating in the canadian nosocomial infection surveillance program cnisp.pdf](https://www.cambridge.org/core/services/aop-cambridge-core/content/view/8F5D864E6959E265BB4931C795267331/S0899823X18000247a.pdf/response%20to%20alert%20on%20possible%20infections%20with%20mycobacterium%20chimaera%20from%20contaminated%20heatercooler%20devices%20in%20hospitals%20participating%20in%20the%20canadian%20nosocomial%20infection%20surveillance%20program%20cnisp.pdf))

Campaigns and related activities:

- Pan Canadian [Framework](https://www.canada.ca/en/health-canada/news/2017/09/government_of_canadareleasespan-canadianframeworkonantimicrobial.html)- on Antimicrobial Resistance
(https://www.canada.ca/en/health-canada/news/2017/09/government_of_canadareleasespan-canadianframeworkonantimicrobial.html)
- [Prevention of antibiotic resistance](https://www.canada.ca/en/public-health/services/antibiotic-antimicrobial-resistance/prevention-antibiotic-resistance.html) (<https://www.canada.ca/en/public-health/services/antibiotic-antimicrobial-resistance/prevention-antibiotic-resistance.html>)
- [Hand Hygiene Awareness](http://www.patientsafetyinstitute.ca/en/Events/StopCleanYourHandsDay/Pages/default.aspx): Stop Clean Your Hands Day in partnership with the Canadian Patient Safety Institute
(<http://www.patientsafetyinstitute.ca/en/Events/StopCleanYourHandsDay/Pages/default.aspx>)

Press activities:

Located on the PHAC [website](https://www.canada.ca/en/health-canada.atom.xmlPublications) (<https://www.canada.ca/en/health-canada.atom.xmlPublications>)

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

Meeting Date: May 17-18, 2018

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

Liaison Representative Name: Louise Dembry, MD, MS, MBA

Organization Represented: **The Society for Healthcare Epidemiology of America**

Interim activities and updates:

SHEA Spring 2018: Science Guiding Prevention

Under the leadership of Planning Chair, Dr. Matthew Linam and Vice Chair Dr. Judy Guzman–Cottrill, SHEA Spring 2018 was held in Portland, Oregon, April 18 – 20, 2018, with a total of **798** registrants, **71** registrants for the new Pre-Conference Workshop, and **183** purchased a Foundation Dinner ticket.

SHEA 2018 highlights include:

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

SHEA/CDC Outbreak Response Training Program (ORTP)

In May 2016, SHEA received a 2-year contract from CDC to execute the SHEA Outbreak Response Training Program (ORTP) which is designed to provide US hospital epidemiologists with the tools and training in incident management to protect patients and healthcare workers during public health emergencies and facility outbreaks. To find out more, visit the SHEA [website \(http://ortp.shea-online.org/\)](http://ortp.shea-online.org/)

All projects have been completed and are publicly available at no cost:

- 3 Effective Communication Webinars
 - “Communication during Crisis,” Dr. E. Yoko Furuya, February 6, 2017. 3,662 total registrants and 2,592 total webinar participants. The phone line was maxed out with 150 people calling-in as well. The webinar was recorded and can be found

the Westin Gaslamp Quarter in San Diego. We had a turnout of **150** attendees with overall positive feedback about the workshop. The second workshop was held November 15 – 16, 2017 at the Chicago Wyndham, in Chicago, Illinois. We had a turnout of **185** attendees with overall positive feedback about the workshop. Registration for the third and final workshop will open summer 2018. To find out more, please visit the [website \(http://www.asresearchworkshop.org/\)](http://www.asresearchworkshop.org/).

Antimicrobial Stewardship Podcasts

SHEA has completed the last of the four-podcast series entitled Stewardship: Practical Approaches and Applications with the theme 'ripped from the hallways'. The first podcast was on Syndromic Stewardship (*Clostridium difficile* associated diarrhea (CDAD)) and the two speakers were Libby Dodds-Ashley, PharmD and Larissa Mays, MD. The second podcast was on Changing the Culture of Culturing and the two speakers were James 'Jim' Lewis, PharmD and Julia Szymczak, PhD. The third podcast was on The Big Picture on UTI and the two speakers were Susan Cofin, MD, MPH and Chris Crnich, MD, PhD, MS. The last podcast launched February 12, 2018 on the Upper Respiratory Infections and Role of Antimicrobials and the two speakers were Debra Palazzi, MD Med and Ellen Wald, MD. The Education Committee is reviewing potential extension of the series and additional online audio educational sessions for the new Learning Management System.

Online Learning

SHEA has purchased a Learning Management System to house all Online Educational Content for SHEA. The Education Committee is working to develop content and programming for this new online learning platform and the site was soft launched at SHEA Spring.

IDWeek 2018

Ebbing Lautenbach, MD alongside the Vice Chair, Kris Bryant, MD and SHEA committee representatives: Drs. Tom Talbot, Shelley Magill, Tara Palmore, and Hilary Babcock identified the sessions for Category N & S for IDWeek. These categories will be represented with 2 Pre-Meeting Workshop, 8 MTPs, 2 Interactive Sessions, and 13 Symposiums. Jan Patterson, MD was elected and has accepted the SHEA Lectureship.

Primer on Healthcare Epidemiology, Infection Control and Antimicrobial Stewardship

SHEA launched its Online Primer on June 1, 2015. This online educational course offers any Infectious Diseases practitioner or Fellow an opportunity to learn the basics of healthcare epidemiology, infection prevention and antimicrobial stewardship. Written by experts from adult and pediatric healthcare epidemiology, case-based information is presented in a dynamic and interactive learning environment intended to highlight the role of the healthcare epidemiologist. With 12 modules and topics varying from pathogen transmission, outbreak management in the healthcare setting, approach to control of bioterrorism agents, advanced occupational health management, implementing antimicrobial stewardship and the prevention and management of multidrug resistant organisms including *Clostridium difficile*, surgical site infections and device-associated infections, to name a few.

This course has been very well received by Fellows and Physicians in the field. 4 CME credits are available for this course. This is a product of the membership of the Society of Healthcare Epidemiology of America and is endorsed by the Infectious Diseases Society of America (IDSA) and Pediatric Infectious Diseases Society (PIDS). SHEA recently added Maintenance of Certification (MOC) points for the Primer. To date, 36 Physicians have claimed MOC and since its launch, 1020 individuals have purchased this course (823 Fellows and 197 Physicians). The SHEA Education Committee will be 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 that do not work.

Guidelines and Guidance:

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

- In January, SHEA published its expert [guidance](#), Duration of Contact Precautions: endorsed by SHM, APIC, and AMMI Canada (<https://doi.org/10.1017/ice.2017.245>)
- The Guidelines Committee (GLC) is currently writing/overseeing:
 - Infection Prevention in Anesthesia Expert Guidance (under revisions following external comments)
 - Initiation of Antibiotics Expert Guidance
 - NICU White Paper Series (*C. difficile* (under review by Board following GLC approval), respiratory infections, CLABSI, *S. aureus*)
- Writing panels are being created for three updates:
 - SHEA Healthcare Workers Infected with Bloodborne Pathogens (white paper)
 - Sterilization and Disinfection (3-part expert guidance)
 - Infection Prevention in LTC (2-part expert guidance)
- In 2018, the GLC has reviewed:
 - SHEA: NICU *C. difficile* White Paper (under review by Board)
 - SHEA: 2014 Healthcare Personnel Attire (determined to be “current”)
 - SHEA: ORTP [Toolkits](#) (approved) (<https://ortp.guidelinecentral.com>)
 - IDSA/SHEA *C. difficile* Practice Guidelines Update (endorsed)
 - AAAAI-IDSA-SHEA Penicillin Allergy Consensus Paper (comments submitted, awaiting revisions)
 - IDSA Seasonal Influenza (endorsed)
 - IDSA Asymptomatic Bacteriuria Guideline (under review by Board)
 - PHAC Infected Healthcare Provider Guideline (comments submitted, awaiting revisions)
 - MITIGATE Urgent Care and ED Stewardship Tool Kit (comments submitted)
- SHEA-IDSA Compendium: lead authors of 7 sections have submitted reviews and recommendations for updates to be discussed by the GLC

Policy:

The Public Policy and Government Affairs (PPGA) Committee is reviewing the FY19 Inpatient Prospective Payment System proposed rule. Of note is a recommendation to remove the CAUTI, CLABSI, Colon and Abdominal Hysterectomy SSI, MRSA Bacteremia, and CDI measures from the Hospital VBP Program beginning with the FY 2021 program year, with data collection on these measures for purposes of the Hospital VBP Program ending with December 31, 2018 discharges. SHEA will submit comments and release a statement in response to this proposal.

SHEA recently submitted written Outside Witness Testimony to the House of Representatives in a joint letter with the Association for Professionals in Infection Control and Epidemiology. A similar letter will be submitted to the Senate shortly.

The PPGA continues to focus on the FY19 budget and appropriations process and advocacy for the “Strategies to Address Antibiotic Resistance Act” or the STAAR Act.

Research Agenda:

A working group has been convened to develop and publish an antibiotic stewardship research agenda to identify important knowledge and research gaps in the advancement of antibiotic stewardship implementation in practices. The working group is expected to complete sometime in the third quarter of 2018 with publication in ICHE shortly thereafter.

The SHEA Education and Research Foundation and the SHEA Research Committee announced the availability of a new research grant award for early investigators in the field of healthcare epidemiology. This new grant, the SHEA Research Scholars Award, will disburse up to \$40,000 to the winning proposal. The winner and award will be announced at IDWeek 2018 in San Francisco, CA.

The SHEA Education and Research Foundation and the SHEA Research Committee hosted the 6th Annual Epi Project Competition at the SHEA 2018 Spring Conference in Portland, OR. The winner of the competition is Valerie Vaughn, MD, MSc, Assistant Professor of Medicine at the University of Michigan. Dr. Vaughn's proposal, "Antibiotic Overuse at Hospital Discharge," was selected from a group of five finalists who delivered oral presentations. Dr. Vaughn will receive a grant of \$20,000 to carry out her research and publish it in a future issue of ICHE.

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>)

- Probiotics Useful in the Fight Against Infection Prevention - Date Published: April 26, 2018
- World Immunization Week Recognizes Gains Brought by Vaccines, Finds Continuing Gaps - Date Published: April 24, 2018
- Infectious Diseases Experts Applaud New Omnibus Funding Bill - Date Published: March 27, 2018
- Infection prevention and control programs are essential to antibiotic stewardship efforts - Date Published: March 26, 2018
- SHEA Announces Newest Delegation of the International Ambassador Program - Date Published: March 12, 2018
- Troubling Trend in Antibiotic Prescriptions in the Outpatient Setting - Date Published: March 08, 2018
- Infectious Diseases Experts Applaud Legislation to Address Antibiotic Resistance - Date Published: March 01, 2018

Publications:

SHEA just launched two new textbooks

- [Practical Healthcare Epidemiology](https://doi.org/10.1017/9781316597170), 4th Edition (<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:

IDSA, SHEA and PIDS Announce Inaugural LEAP Fellowship Awardees

IDSA, SHEA and PIDS are pleased to announce the first awardees of the Leadership in Epidemiology, Antimicrobial Stewardship, and Public health (LEAP) Fellowship. Currently in its inaugural year, the LEAP Fellowship is a \$100,000 training award competitively granted to four promising young infectious diseases physicians. Funded by the Centers for Disease Control and Prevention, this fellowship aims to foster the next generation of Infectious Diseases leaders in public health, hospital epidemiology and antimicrobial stewardship, giving them the hands-on experience they'll need to lead and collaborate across these disciplines of healthcare.

Awardees:

- Milner Staub, MD, Vanderbilt University

Leap Fellowship Project: An Assessment of Outpatient Antimicrobial Prescription Across Tennessee Based on Practice Location, Specialty and Provider

- Dana Pepe, MD, Yale School of Medicine

Leap Fellowship Project: Expanding Utilization of Targeted Assessment for Prevention (TAP) Strategy in Connecticut

- Gabriella Andujar Vazquez, MD, Tufts Medical Center

LEAP Fellowship Project: Enhanced Support for Long Term Care Facilities Participating in a Massachusetts Department of Public Health Antimicrobial Stewardship Initiative

- Jennifer Blumenthal, MD, Boston Children's Hospital

LEAP Fellowship Project: Assessing and Optimizing the Utility of the Massachusetts Statewide Antibigram

The LEAP Fellowship will commence July 1, 2018 and last one year. The Fellowship is for early career infectious diseases physicians - those in their second or third year of fellowship or up to two years post fellowship.

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

Meeting Date: May 17, 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 is working with the Health Research and Educational Trust (HRET) to identify strategies for reducing MRSA, CAUTI, *C.diff* and CLABSI in hospitals across the United States.
- SHM developed the antimicrobial stewardship implementation guide and educational modules for hospitalists regarding the implementation of antimicrobial stewardship programs in the hospital
 - The guide and modules are available on SHM's website.
- SHM continues to promote its Fight the Resistance Campaign dedicated to promoting awareness and behavior change related to antimicrobial stewardship and appropriate prescribing practices.

Guidelines and Guidance:

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

- None at this time

Position Statements:

- February 6, 2018: [SHM Signs onto Multi-Stakeholder Letter Regarding PAHPA](https://www.hospitalmedicine.org/policy--advocacy/letters/shm-signs-onto-multi-stakeholder-letter-regarding-pahpa/)
(<https://www.hospitalmedicine.org/policy--advocacy/letters/shm-signs-onto-multi-stakeholder-letter-regarding-pahpa/>)
 - Along with other organizations, SHM signs onto a letter requesting incentives for new antimicrobial research within the Pandemic and All-Hazards Preparedness Act (PAHPA).

Legislation:

- None at this time.

Campaigns and related activities:

- None at this time.

Press activities:

- None at this time

Publications:

- [When are Oral Antibiotics a Safe and Effective Choice for Bacterial Bloodstream Infections? An Evidence Based Narrative Review](https://www.journalofhospitalmedicine.com/jhospmed/article/158901/hospital-medicine/when-are-oral-antibiotics-safe-and-effective-choice)
(<https://www.journalofhospitalmedicine.com/jhospmed/article/158901/hospital-medicine/when-are-oral-antibiotics-safe-and-effective-choice>)
- [Days of Therapy Avoided: A Novel Method for measuring the Impact of an Antimicrobial Stewardship Program to Stop Antibiotics](https://www.journalofhospitalmedicine.com/jhospmed/article/157562/hospital-days-of-therapy-avoided)
([https://www.journalofhospitalmedicine.com/jhospmed/article/157562/hospital-](https://www.journalofhospitalmedicine.com/jhospmed/article/157562/hospital-days-of-therapy-avoided)

- [medicine/days-therapy-avoided-novel-method-measuring-impact](#)
- [Treatment Trends and Outcomes in Healthcare-Associated Pneumonia \(https://www.journalofhospitalmedicine.com/jhospmed/article/149976/hospital-medicine/treatment-trends-and-outcomes-healthcare-associated\)](https://www.journalofhospitalmedicine.com/jhospmed/article/149976/hospital-medicine/treatment-trends-and-outcomes-healthcare-associated)
- [Shorter Versus Longer Courses of Antibiotics for Infection in Hospitalized Patients: A Systematic Review and Meta-Analysis \(https://www.journalofhospitalmedicine.com/jhospmed/article/156407/hospital-medicine/shorter-versus-longer-courses-antibiotics-infection\)](https://www.journalofhospitalmedicine.com/jhospmed/article/156407/hospital-medicine/shorter-versus-longer-courses-antibiotics-infection)
- [Review of Strategies to Reduce Central Line-Associated Bloodstream Infection \(CLABSI\) and Catheter-Associated Urinary Tract Infection \(CAUTI\) in Adult ICUs \(https://www.journalofhospitalmedicine.com/jhospmed/article/151403/hospital-medicine/review-strategies-reduce-central-line-associated\)](https://www.journalofhospitalmedicine.com/jhospmed/article/151403/hospital-medicine/review-strategies-reduce-central-line-associated)

Other items of note:

- The Hospitalist:
 - [Sepsis versus SIRS blood test shows high sensitivity \(https://www.the-hospitalist.org/hospitalist/article/164323/critical-care/sepsis-versus-sirs-blood-test-shows-high-sensitivity?utm_medium=Social&utm_source=Twitter&utm_campaign=TH&utm_term=4.26.18&utm_content=sepsis\)](https://www.the-hospitalist.org/hospitalist/article/164323/critical-care/sepsis-versus-sirs-blood-test-shows-high-sensitivity?utm_medium=Social&utm_source=Twitter&utm_campaign=TH&utm_term=4.26.18&utm_content=sepsis)
 - [Antibiotic awareness tops ID agenda \(https://www.the-hospitalist.org/hospitalist/article/163247/infectious-diseases/antibiotic-awareness-tops-id-agenda\)](https://www.the-hospitalist.org/hospitalist/article/163247/infectious-diseases/antibiotic-awareness-tops-id-agenda)
 - [Paring the risk of antibiotic resistance \(https://www.the-hospitalist.org/hospitalist/article/158091/antimicrobial-resistance/paring-risk-antibiotic-resistance\)](https://www.the-hospitalist.org/hospitalist/article/158091/antimicrobial-resistance/paring-risk-antibiotic-resistance)

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

Meeting Date: May 17-18, 2018

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

Liaison Representative name: Robert G. Sawyer

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

Interim activities and updates:

- The annual meeting of the SIS was held in Westlake Village, California, April 23-25. The theme was global surgery and infections. Over 100 presentations in all areas related to surgical infections were given, as well as several update symposia.
- On April 26th, in conjunction with the SIS meeting, a day-long meeting of the ASSIST group, led by Heather Evans and Bill Lober from the University of Washington was held. Through a contract with the CDC, this group is using a health technology assessment approach to identify parameters around the use of patient-generated health data (PGHD) and specifically imaging, in the management of patients with surgical wounds. Major points of discussion included the actual technology involved, protection of patient data, interfaces with patients and providers, and the use of imaging in both surveillance and clinical definitions of surgical site infection.

Guidelines and Guidance:

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

- Updated guidelines for the management of skin and soft tissue infections
- As noted above, in conjunction with the SIS and CDC, Drs. Evans and Lober will be authoring a report related to the appropriate use of PGHD in the management of surgical wounds
- The World Surgical Infection Society (WSIS) is partnering with the SIS and many other surgical societies to developed evidence-based guidelines for source control in the setting of intra-abdominal infections. Currently, PICO-format questions are being finalized and the systematic reviews are scheduled to start in July of 2018.

Position Statements:

- NA

Legislation:

- NA

Campaigns and related activities:

- NA

Press activities:

- NA

Publications:

- Oral Nutrition as a Form of Pre-Operative Enhancement in Patients Undergoing Surgery for Colorectal Cancer: A Systematic Review. Bruns Emma R.J. , Argillander Tanja E. , Van Den Heuvel Baukje , Buskens Christianne J. , Van Duijvendijk Peter , Winkels Renate M. , Kalf Annette , Van Der Zaag Edwin S. , Wassenaar Eelco B. , Bemelman

- Willem A. , and Van Munster Barbara C. Published Online:1 Jan 2018.
- Surgical Site Infections after Inguinal Hernia Repairs Performed in Low- and Middle-Human Development Index Countries: A Systematic Review. Cai Lawrence Z. , Foster Deshka , Kethman William C. , Weiser Thomas G. , and Forrester Joseph D. Published Online:1 Jan 2018.
 - Pathogen- and Danger-Associated Molecular Patterns and the Cytokine Response in Sepsis. Rajaei Arezoo, Barnett Rebecca, and Cheadle William G. Pages:107–116. Published Online:24 January 2018.
 - Surgical Site Infections after Appendectomy Performed in Low and Middle Human Development-Index Countries: A Systematic Review. Foster Deshka, Kethman Will, Cai Lawrence Z., Weiser Thomas G., and Forrester Joseph D. Pages:237–244. Published Online:23 October 2017.
 - Synovial Fluid Leukocyte Esterase in the Diagnosis of Peri-Prosthetic Joint Infection: A Systematic Review and Meta-Analysis. Wang Chi, Li Rui, Wang Qi, and Wang Chengbin. Pages:245–253. Published Online:3 November 2017.
 - Surgical Site Infections after Open Reduction Internal Fixation for Trauma in Low and Middle Human Development Index Countries: A Systematic Review. McQuillan Thomas J., Cai Lawrence Z., Corcoran-Schwartz Ian, Weiser Thomas G., and Forrester Joseph D. Pages:254–263. Published Online:17 January 2018.

Other items of note:

The major theme for the Surgical Infection Society meeting in April 2018 was global surgery and surgical infectious diseases. The SIS intends to become a major home for work in this area by actively partnering with many other like-minded societies, including the WSIS, the WHO, SIS-Europe, SIS- Latin America, West African College of Surgeons, the Chinese Surgical Infection Society, the Japanese Surgical Infection Society, the Philippine College of Surgeons, the Malaysian College of Surgeons, and several other groups. Much of the focus will be on low- and middle-income countries where incremental interventions through local societies may yield larger payoffs than work in North America and Europe.